



Eskom Holdings SOC Limited

FINAL ENVIRONMENTAL SCOPING REPORT

The Proposed Development of a Nuclear Power Plant
(up to 5 200 MW)

DFFE Reference Number: 14/12/16/3/3/2/2806





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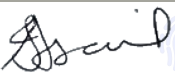
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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
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All changes between the Draft and Final Scoping Report have been highlighted as underlined text.

WSP confirms that no substantive changes have been made to the FSR. Additions and changes are only as a result of Authority / public comments, requests and recommendations.



PROJECT INFORMATION

Applicant

Eskom Holdings SOC Limited

Project Name

The Proposed Development of a Nuclear Power Plant (up to 5 200 MW) in Thyspunt – Kouga Local Municipality in the Eastern Cape Province / Bantamsklip – Overstrand Local Municipality in the Western Cape Province

DFFE Reference Number

14/12/16/3/3/2/2806

WSP Project Number

ZA0058322.7774

Report Type

Final Environmental Scoping Report

GENERAL SITE INFORMATION

Aspect	Details
Technical details of the proposed development of a Nuclear Power Plant (up to 5 200 MW) in Thyspunt – Kouga Local Municipality in the Eastern Cape Province / Bantamsklip – Overstrand Local Municipality in the Western Cape Province	
Technology	Nuclear
Location of Site	Bantamsklip in the Overstrand Local Municipality within the Overberg District Municipality of the Western Cape Province, situated on the Southern Cape coast, mid-way between Danger and Quoin Points or Thyspunt in the Kouga Local Municipality within the Sarah Baartman District Municipality (previously known as Cacadu District Municipality) of the Eastern Cape Province, situated between Oyster Bay and St. Francis Bay.
Description of all affected farm portions and 21-digit SG Codes	Thyspunt
	Farm 745 Portion 238 C03400000000074500238
	Farm Langefontein 736 Portion 1 C03400000000073600001
	Farm Langefontein 736 Portion 2 C03400000000073600002
	Farm Langefontein 736 Portion 3 C03400000000073600003
	Farm Langefontein 736 Portion 4 C03400000000073600004
	Farm Langefontein 736 Portion 5 C03400000000073600005
	Farm Langefontein 736 Portion 6 C03400000000073600006
	Farm Langefontein 736 Portion 7 C03400000000073600007
	Farm Langefontein 736 Portion 8 C03400000000073600008
	Farm Langefontein 736 Portion 172 C03400000000073600172
	Farm Welgelegen 735 Portion 2 C03400000000073500002
	Farm Welgelegen 735 Portion 9 C03400000000073500009
	Farm Welgelegen 735 Portion 10 C03400000000073500010
	Farm Welgelegen 735 Portion 14 C03400000000073500014
	Farm Welgelegen 735 Portion 16 C03400000000073500016
	Farm Welgelegen 735 Portion 17 C03400000000073500017
	Farm Welgelegen 735 Portion 18 C03400000000073500018

Aspect	Details	
	Farm Welgelee 743 Portion 0	C03400000000074300000
	Farm Welgelee 743 Portion 4	C03400000000074300004
	Farm Welgelee 743 Portion 6	C03400000000074300006
	Farm Welgelee 743 Portion 8	C03400000000074300008
	Farm 741 Portion 0	C03400000000074100000
	Farm Buffels Bosch 742 Portion 0	C03400000000074200000
	Farm Buffels Bosch 742 Portion 6	C03400000000074200006
	Farm Buffels Bosch 742 Portion 9	C03400000000074200009
	Farm Buffels Bosch 742 Portion 12	C03400000000074200012
	Farm Buffels Bosch 742 Portion 14	C03400000000074200014
	Farm Buffels Bosch 742 Portion 16	C03400000000074200016
	Farm Buffels Bosch 742 Portion 17	C03400000000074200017
	Farm Buffels Bosch 742 Portion 18	C03400000000074200018
	Farm Buffels Bosch 742 Portion 19	C03400000000074200019
	Farm Buffels Bosch 742 Portion 20	C03400000000074200020
	Farm Buffels Bosch 742 Portion 21	C03400000000074200021
	Farm Buffels Bosch 742 Portion 22	C03400000000074200022
	Farm 824, Portion 0	C03400000000082400000
	Farm 825 Portion 0	C03400000000082500000
	Farm 826, Portion 1	C03400000000082600001
	Farm 809, Portion 0	C03400000000080900000
	Farm 809, Portion 36	C03400000000080900036
	Farm 746, Portion 0	C03400000000074600000
	Farm 746, Portion 5	C03400000000074600005
	Farm 746, Portion 11	C03400000000074600011
	Farm 746, Portion 14	C03400000000074600014
	Farm 746, Portion 23	C03400000000074600023
	Farm 746, Portion 24	C03400000000074600024

Aspect	Details	
	Farm 746, Portion 87	C03400000000074600087
	Farm 746, Portion 92	C03400000000074600092
	Bantamsklip	
	Farm Hagelkraal 318 Portion 0	C01100000000031800000
	Farm Hagelkraal 318 Portion 1	C01100000000031800001
	Farm Buffel Jagt 309 Portion 2	C01100000000030900002
	Farm Buffel Jagt 309 Portion 3	C01100000000030900003
	Farm Buffel Jagt 311 Portion 0	C01100000000031100000
	Farm Luipaards Poort 310 Portion 0	C01100000000031000000
	Farm 338, Portion 0	C01100000000033800000
Total Buildable Area (i.e. likely footprint area)	Thyspunt 250 ha	Bantamsklip 170 ha
Central coordinates of the site and activity location	Thyspunt 34°11'20.67"S; 24°42'46.58"E	Bantamsklip 34°42'25.92"S; 19°33'53.90"E
Design Specifications		
Export Capacity	Up to 5 200 MW (subject to finalisation based on generation capacity scenario selection)	
Design Life	60 years with possibility to extend to 80 years	
Reactor	The proposed development will include multiple units of large conventional Pressurised Water Reactors (PWR) or Small Modular Reactors (SMR) of either PWR or High Temperature Gas Reactors (HTGR) or a mixture thereof (i.e. both conventional and Small modular reactors on the same site). To this end the S&EIR Process will be technology neutral and use a Plant Parameter Envelope approach, meaning it will use parameters from multiple reactor technologies and provide an assessment of the likely effects of a new nuclear project by forming a bounding case. This approach provides flexibility for Eskom regarding future new nuclear deployment.	
Plant Heat Sink	- Sea water cooling using up to around 200 m³/s. - The maximum increase in the temperature of the recirculated water should be < 12°C	
Circulating Water Treatment System	Total residual oxidant - 0.5 mg/l	
Intake Structure	- Distance off shore (m): 1 000 to 2 000 - Number of Tunnels (for power station): 2 to 3 - Diameter of tunnels (m): 5 to 10 - Depth of Tunnels (m): ± 30	

Aspect	Details
Outfall Structure	- Number of tunnels: 3 to 4 - Diameter of tunnels (m): Approximately 3 - Distance off shore (m): Approximately 500 - Depth of Tunnels (m): Approximately 5
Potable Water System	Maximum Use: 140 l/s / 104.72 l/s (for air-cooled reactors) Stored Water Volume: - Site water (SEP): 48 740 m³ - Feed water (SER): 8 073 m³ - Demineralised (SED): 1 346 m³ - Condensate feed water (ASG): 4 306 m³ - Demineralised primary make-up water (REA): 45 747 m³ - Borated Refuelling Water (PTR): 8 611 m³
Demineralised Water System	- Maximum use / withdrawal from water source: 49.96/s (4 units) - Capacity of demineralised water storage: 4 x 2 200 m³ + 2 x 800 m³ = 45 747 m³ {2 Demineralised primary make-up water tanks (REA) [8 500 m³] 17 595 m³}
Fire Protection System	- Maximum Use of Raw Water: 104.2 l/s - Dependent upon chosen reactor technology - Stored Water Volume: 15 254.2 m³
Used Fuel	- Total Mass of used fuel during Licensed Operation: ~5 925 T (60 years) per unit - Spent Fuel Storage Pool: capacity of 10 years + full core offload (nominal), with a volume of 3 380m³ (total volume below normal water level assemblies or racks) - Spent Fuel Dry Storage: 12.14 ha with a storage capacity of 80 years
Standby Power System	- Diesel: capacity of 4 x 20 MW, with a storage tank capacity of 6 900 m³ - Station Black-out Diesels: capacity of 2 x 5 MW with storage tank capacity of 1300 m³ - Gas-Turbines: with a capacity of 77 MW
Hydrogen Plant	- H2 Plant / Unit: 15 x 2 Nm³/h @ 25 4 x Storage Tanks: 30 Nm³
Auxiliary Steam Boiler	- Auxiliary Steam Boiler: 8 x 32 t/h - Diesel Storage Tanks: 676 m³
Access Routes	- Heavy Haul Routes: 4.00 ha - Maximum Shipment Weight: 1 100 t
Office Facilities	11 ha
Parking Lots	2.5 ha
Permanent Support Facilities	11 ha
Power Block	20.6 ha

Aspect	Details	
Protected Areas (maximum)	40 ha	
Switchyard (maximum)	9.7 ha	
Laydown Areas and temporary Construction Facilities	- Laydown Areas: 23.5 ha (for laydown only) - Temporary Construction Facilities: 24.3 ha (concrete batch plant) - Construction Parking Lot: 16.2 ha (Construction parking with separate construction site access road)	
Civil Works – Spoil	Bantamsklip	Thyspunt
	- Natural Ground to Topsoil (0,3m deep): 197 850 m³ - Sand Stockpile: 11 965 574 m³ - Backfill: 1 892 301 m³ - Sand to Spoil: 10 073 273 m³ - Rock Stockpile: 1 198 591 m³	- Natural Ground to Topsoil (0,3m deep): 229 456 m³ - Sand Stockpile: 7 890 419 m³ - Backfill: 1 518 375 m³ - Sand to Spoil: 6 372 044 m³ - Rock Stockpile: 708 356 m³
Plant Population	Construction: 6 500 vendor construction workers; 2 860 vendor staff; 300 Eskom Project Staff; 52 Eskom Consultants; 700 (off-site – 300 substation, 400 transmission) Operation: 2400 persons (on-site) Refuelling/Major Maintenance: 1 000 persons	

DFFE CORRESPONDENCE

DFFE COMMENTS ON THE DRAFT SCOPING REPORT DATED

DFFE Comment	EAP Response
<u>COMMENTS ON THE DRAFT SCOPING REPORT FOR THE PROPOSED 5200MW NUCLEAR POWER PLANT (NPP) FACILITY LOCATED IN OVERSTRAND LOCAL MUNICIPALITY IN THE WESTERN CAPE PROVINCE AND KOUGA LOCAL MUNICIPALITY IN THE EASTERN CAPE PROVINCE</u> <u>The Application for Environmental Authorisation and draft Scoping Report (SR) dated April 2026, received by the Department on 31 March 2026 and acknowledged on 01 April 2026, refer. This letter serves to formally convey the Department's comments on the draft SR. The matters raised below must be addressed and incorporated into the final SR.</u> <u>This letter serves to inform you that the following information must be included to the final SR:</u>	<u>This comment is acknowledged.</u> <u>Individual comments are responded to below.</u>
<u>1. Application form and Listed Activities</u> <u>a) The Department notes that Eskom is awaiting confirmation of Strategic Integrated Project (SIP) status from Infrastructure South Africa. The application will continue to be reviewed in accordance with the timeframes prescribed in the Environmental Impact Assessment Regulations, 2014, as amended (the EIA Regulations), pending such confirmation.</u>	<u>It is confirmed that Eskom received confirmation of SIP registration for the project under SIP 9 on 26 May 2026. There is, however, an error in the confirmation letter in that it only refers to Thyspunt and not the nuclear program as a whole. Submission has been made to Infrastructure South Africa to rectify this reference. The SIP letter is attached in Appendix L.</u>
<u>b) Once listed activities have been confirmed, please ensure that the relevant listed activities are applied for, are specific and can be linked to the development activity or infrastructure as described in the project description. Please provide a full description of how the listed activity is triggered by the proposed development, including the threshold where necessary. Only activities applicable to the development must be applied for and assessed. Please note, sub-activities for all listing notices, must be chosen per activity e.g. LN3, Act 4 (f)(i) (bb). The wording of the listed activities must be more definitive and avoid the use of words such as 'may.</u>	<u>It is confirmed that once listed activities have been finalised, the relevant listed activities will be applied for and will be specific and linked to the development activity or infrastructure as described in the project description. Furthermore, sub-activities will be listed for all listing notices as required.</u> <u>A full description of how the listed activity is triggered by the proposed development, including the thresholds (where necessary) will be included in the Draft EIA report.</u> <u>It is acknowledged that only activities applicable to the development will be applied for and assessed.</u> <u>The current listed activities are outlined in Section 7.5 of the Final Scoping Report.</u>
<u>c) The terms of reference for the appointed peer reviewers must be clearly defined and included in all subsequent documentation. At the Environmental Impact Assessment stage, formal letters from the peer reviewers must be submitted, confirming that they have reviewed the relevant assessment documentation and indicating their professional support for the preferred alternative identified in the Environmental Impact Assessment Report (EIAR).</u>	<u>The purpose of the peer reviews is outlined in Section 1.5.5 of the FSR.</u> <u>The terms of reference for the appointed peer reviewers has been outlined in Section 11.8 of the FSR</u>

DFFE Comment	EAP Response
<u>d) The impacts of the NPP activities, including wastewater treatment works, grid, desalination plant, beach wells, etc. must be assessed as they are integral to the project and the power station cannot operate without them. The environmental impacts of the associated infrastructure on-site must be assessed in a comparative manner in the final EIAR (with special attention being given to any infrastructure outside of the EIA and HV corridors), in order to ensure that the Department has all relevant information required to make an informed decision on this application. Furthermore, the associated infrastructure off-site (e.g. all forms of construction, accommodation, access roads, temporary and permanent powerlines) must be assessed in a comparative manner but at a strategic/ concept level of detail (possibly as a cumulative impact).</u>	The EIA process includes the assessment of all on-site associated infrastructure required for the operation of the proposed Nuclear Power Plant (NPP), such as wastewater treatment works, desalination facilities, and abstraction systems, as part of the project description and specialist studies presented in the Draft Scoping Report. Accordingly, the potential environmental impacts of these components will be assessed in detail during the EIA phase, including a comparative evaluation across the alternative sites, to ensure that the competent authority (DFFE) is provided with sufficient information to inform decision-making. With respect to off-site associated infrastructure, including transmission lines, access roads, and accommodation, it is noted that certain components (e.g. transmission lines) fall under separate authorisation processes and applicants, and will therefore be assessed through independent but related EIAs. Nevertheless, the interrelated nature of these developments is recognised, and the EIA will include a strategic and cumulative assessment of such infrastructure to understand broader environmental and socio-economic implications. Furthermore, the Scoping Report confirms that cumulative impacts and indirect effects associated with the project and its supporting infrastructure will be identified and assessed, particularly where these may influence ecological, marine, or socio-economic sensitivities across the broader receiving environment. This approach ensures that both site-specific and wider system-level implications are considered in an integrated manner. In summary, the EIA process is structured to assess all integral components of the NPP project at an appropriate level of detail, with detailed assessments undertaken for on-site infrastructure and strategic-level consideration of off-site elements, thereby supporting a comprehensive and informed environmental authorisation decision.
<u>e) Ensure that impact assessment methodologies are clearly defined and applied consistently across all alternatives. Specialists should also have consensus on the implication of impact assessment methodologies, where possible.</u>	The impact assessment methodology is clearly defined in Section 2.5 as well as Section 11.9 of the FSR. It is confirmed that it will be applied consistently across all alternatives and that the specialists have consensus of the impact methodology.
<u>f) The Plant Parameter Envelope (PPE) approach adopted in the SR must be comprehensively assessed by all specialists. All proposed reactor configurations (including large PWRs, SMRs and HTGRs, whether independently or in combination) must be fully detailed and assessed within the PPE framework (Appendix K).</u>	The Plant Parameter Envelope (PPE) approach presented in the FSR defines the bounding design parameters that all potential reactor technologies must comply with, and these parameters will be applied consistently across all specialist assessments during the EIA phase. As such, a range of reactor configurations (proven technologies) falling within this envelope will be assessed based on a credible worst-case scenario approach to ensure that potential environmental impacts are comprehensively evaluated and remain within the defined envelope limits.
<u>g) The applicant/EAP is required to provide an update to the nuclear installation licence by the National Nuclear Regulator (NNR) for this application.</u>	The NNR Board, in accordance with the regulatory provision of the NNR Act conducted public hearings as part of the stakeholder consultation process for the Thyspunt NISL Application. Public hearings were held on 25 and 26 August 2021 at Cape St. Francis and Jeffreys Bay, as well as on 23 and 24 November 2021 at Humansdorp and Hankey. The Nuclear Installation Site Licence (NISL) application for Thyspunt is currently still under NNR review. Once the NNR

DFFE Comment	EAP Response
	has completed its review of the NISL Application, they will instruct Eskom to publish a set of documents and inform the stakeholders, after which there will be a 90 day period for written representations. The NNR will publish a notice of the hearings in the Government Gazette if the NNR Board decides to have further public hearings. There are no stipulated timelines for the NNR process. It is anticipated that a response will be received from the NNR in the last quarter of 2026.
<u>h) The applicant/EAP must provide further information on the applicability of a Waste Management Licence (WML) in terms of the National Environmental Management: Waste Act for all NPP-related components.</u>	The Draft Scoping Report acknowledges that waste streams associated with the proposed NPP and its supporting infrastructure will be further defined during the EIA phase, at which stage the applicability of listed waste management activities and the requirement for a Waste Management Licence (WML) in terms of the National Environmental Management: Waste Act will be confirmed. Accordingly, the EIAR will identify all relevant waste-related activities across project components and outline the applicable regulatory requirements, including any necessary WML processes, to ensure full compliance with the Waste Act. It can be confirmed that the National Environmental Management: Waste Act (NEM:WA) does not cover the storage and disposal of radioactive waste.
<u>i) If the activities applied for in the application form differ from those mentioned in the final SR, an amended application form must be submitted for final review and decision making. Please note that the Department's templates can be downloaded from the website.</u>	WSP can confirm that the listed activities in the FSR are the same as the application form.
<u>"2. Project Description</u> <u>a) It is noted that a staff village will not form part of the current assessment and will require an additional EIA process (Section 4.2.2.23 of the draft SR). Further detail must be provided including motivation for not including this aspect as part of the current application."</u>	It is confirmed that the staff village will not form part of the current assessment and will require an additional EIA process. However, as noted above, the impacts of the village will be assessed on a strategic and cumulative level. Eskom has purchased a property outside of Humansdorp on the Oyster Bay Rd. Completing the EIA for a construction village would be premature at this point. Once in the EIA phase of the process, the scope and applicability will be assessed, this outcome can then guide a separate EIA process which can take into consideration the outcomes of the studies which will incorporate the need for a construction village as well as the long term opportunities for Humansdorp, aligned with the SDF, should the property be developed.
<u>b) All associated infrastructure identified in the project description and located within the defined site boundaries must be included in a comprehensive layout plan for each of the two sites. Such infrastructure must be fully described, assessed, and addressed.</u>	All associated infrastructure forming part of the proposed NPP and located within the defined site boundaries is described in the FSR and will be incorporated into detailed layout plans during the EIA phase. Preliminary layouts are included as Figure 6-12 and Figure 6-13 in the FSR. The EIA Report will accordingly provide a comprehensive assessment of these components, including their spatial arrangement and associated impacts for the preferred site, to ensure that all on-site infrastructure is adequately described, assessed, and addressed in support of informed decision-making.
<u>c) It is noted that the current application is limited to the generation facility and its connection to the high-voltage yard; transmission lines to the grid</u>	The integration of transmission infrastructure has been considered in the scoping phase. However, detailed transmission line routing and corridor-level impacts will be

DFFE Comment	EAP Response
<u>will be handled by a separate applicant (the National Transmission Company of South Africa (NTCSA)), and a separate application will be required for those powerlines.</u>	authorised through a separate EIA process under the responsible transmission entity, i.e. the National Transmission Company of South Africa (NTCSA). Given the significant costs associated with transmission integration and requiring a level of certainty prior to initiating this, it is recommended the Generation site is selected prior to significant work being initiated for Transmission infrastructure. (for example the preferred site for this process will then initiate the process for the associated lines) The potential alternative routes to connect to the Tx grid are known and have previously been assessed providing an opportunity for assessing the benefits and challenges for each of the sites at a strategic level.
<u>d) The information regarding a transmission integration plan for both sites is noted. This must be expanded on, and the appointed peer reviewers must provide input to this.</u>	It is confirmed that the FSR recognises the need for transmission integration planning for both sites. However, Section 11.4 outlines the motivation for Thyspunt to be assessed as the preferred site in the EIA Phase. Thyspunt is preferred from a transmission integration perspective due to its closer proximity to existing high-voltage infrastructure (e.g. Grassridge and Dedisa), enabling shorter and less complex transmission connections that can partially utilise established corridors and servitudes. In contrast, Bantamsklip would require significantly longer new transmission corridors and substantial upstream reinforcement, increasing both implementation complexity and environmental impact. NTCSA have confirmed that Thyspunt is preferred due to its location to a load centre. As previously discussed the transmission integration will be assessed at a strategic and cumulative level, with peer review of specialist reports in this regard.
<u>e) As stated in Section 6.4.2.1 of the report: “The integration of the NPP at Thyspunt is based on constructing up to five 400kV lines from the site towards Gqeberha and connecting to the 765kV network at the Grassridge Substation. The 400kV lines will also integrate with the Dedisa Substation and the new 400kV Gqeberha Substation to be established to supply the growing loads in this area. These 400kV transmission lines form part of the development of the transmission networks to improve the security of supply in the Great Gqeberha area and in particular the Coega IDZ. The two 765kV lines (total of 1 400km in length) between Gamma and Grassridge Substations will be required to be constructed by the time Thyspunt is commissioned to evacuate the excess power.” In this context, clarity is required on how the need for this additional transmission infrastructure may affect the implementation schedule of the proposed NPP. The report should indicate the anticipated timeframes for the authorisation and construction of the required grid connection infrastructure and assess the likelihood of delays associated with these processes. Given the acknowledged long lead times for the approval and development of new power corridors, particularly at the Thyspunt site where completion is indicated as being achievable before 2039, Eskom’s level of confidence in delivering the required grid connections timeously.</u>	The applicant acknowledges that the timely implementation of the proposed NPP is dependent on the availability of enabling transmission infrastructure and that grid integration constitutes a critical path dependency for the project. The Final Scoping Report (FSR) recognises this interdependency and confirms that, while transmission infrastructure will be authorised and implemented through a separate NTCSA-led process, the EIA adopts a phased and integrated approach that considers these linkages at a strategic and cumulative level. Accordingly, although detailed timeframes for transmission authorisation and construction fall outside the scope of the current application, the assessment explicitly recognises the long lead times and implementation risks associated with transmission development. Planning is aligned with the anticipated commissioning horizon (circa 2039), with the expectation that a viable grid evacuation pathway will be confirmed through parallel planning and authorisation processes. Notwithstanding the above, the applicant commits that, during the EIA phase, the transmission integration programme will be further developed and clearly articulated, including (i) indicative implementation timeframes; (ii) identification of key dependencies between generation and transmission delivery; and (iii) a structured assessment of risks that may affect programme alignment, including regulatory approvals, funding constraints, and network capacity considerations.

<u>DFFE Comment</u>	<u>EAP Response</u>
<u>including consideration of potential financial or other risks, should be clearly substantiated.</u>	The applicant further notes that, due to the significant cost and complexity associated with transmission development, a level of certainty regarding the preferred generation site is required prior to initiating detailed transmission EIA processes. In this regard, the phased approach provides for the selection of a preferred site before substantial transmission infrastructure planning and assessment is progressed, while ensuring that transmission requirements and cumulative implications are adequately considered in decision-making. Available transmission planning inputs confirm that Thyspunt presents comparatively lower integration complexity due to its proximity to existing transmission nodes, shorter connection distances, and reduced need for extensive new corridors, which supports a higher level of implementation confidence relative to alternative sites. Accordingly, the EIA phase will integrate transmission planning considerations into the overall project implementation framework and provide the competent authority with sufficient, transparent information to assess the feasibility, timing, and risks associated with the required grid connection infrastructure, in line with the requirements of NEMA relating to associated activities and cumulative impacts.
<u>The once through cooling system, the thermal effects of cooling options, as well as the various cooling water intake and discharge options, must be adequately explored during the EIA phase.</u>	The FSR identifies cooling system options and confirms that the potential impacts associated with cooling water abstraction and thermal discharge, including once-through systems, will be assessed in detail as part of the specialist marine and related studies during the EIA phase. The EIA will therefore include a comparative assessment of cooling technologies, as well as intake and discharge configurations, to evaluate and mitigate potential thermal and ecological impacts on the marine environment.
<u>f) Dredging activities, excavation and associated spoil disposal, as included in Section 6.4.6.4. of the draft SR, must be expanded on in the EIAR. The preferred alternative for spoil disposal i.e. offshore disposal must be expanded upon and assessed by specialists where feasible.</u>	Section 6.4.6.4 of the FSR identifies dredging, excavation, and spoil disposal as key project activities, and confirms that the associated impacts, including offshore spoil disposal, will be further assessed in detail during the EIA phase by the relevant specialists (particularly marine and sediment studies). The EIAR will therefore expand on these aspects and include a comparative assessment of feasible spoil management alternatives, including offshore disposal and cut and fill, to evaluate potential environmental risks and inform appropriate mitigation measures.
<u>g) Seawater Reverse Osmosis (SWRO) desalination will be used to provide freshwater during both the construction and operational stages of the power station. The report states that desalination is identified as the preferred long-term water supply option for Thyspunt and Bantamsklip at scoping level, with associated potential environmental effects notably being brine discharge to the marine environment. Detailed assessment of marine impacts and discharge design must be presented during the EIA phase for the preferred site.</u>	The area of impact linked to warm water and brine discharges, as well as sediment transport and potential smothering, will be fully defined as assessed as part of the impact assessment phase. We will use scientific, other monitoring reports and modelling studies to understand the area that may be impacted. The marine ecology team will then assess the implications of this on the marine environment using understanding of the tolerance and responses of marine animals and systems, as well as legislative water quality threshold limits.
<u>"j) In January 2025, SAHRA published a Gazette Notice advising of the 'Provisional Protection of the Thyspunt Site' in terms of section 29 of the National Heritage Resources Act (Act 25 of 1999). The</u>	SAHRA, ECPHRA and HWC were contacted and applications lodged with each authority (as required). As per the recommendation to move forward with Thyspunt into the EIA phase (Section 11 of the FSR), applications for

DFFE Comment	EAP Response
<u>January 2025 Government Gazette provisionally protects defined portions of the Thyspunt Cultural Landscape for up to two years. The Bantamsklip site alternative overlaps with the Groot Hagelkraal Private Nature Reserve.</u> <u>At Thyspunt, the rapid development of wind farms bordering the study area has already created a large network of new powerlines since the 2012 Heritage Impact Assessment and has severely degraded the rural setting surrounding Thyspunt. Another powerline at Thyspunt will therefore add to an existing network of powerlines and the significance of this impact will largely rest on whether Thyspunt Cultural Landscape is formally protected as a National Heritage Site. The EAP/Applicant must illustrate what measures are in place to navigate this provisional protection of the Thyspunt Cultural Landscape in terms of section 29 of the National Heritage Resources Act and adequately address heritage constraints. SAHRA/ECPHRA/ HWC must be continuously engaged this regard."</u>	<u>Bantamsklip have not been submitted and HWC has fallen away as an affected authority but engagements are continuing with ECPHRA and SAHRA at Thyspunt. There is an application submitted by Thyspunt Alliance to register the site as a cultural landscape. SAHRA is required to complete an investigation to confirm this status. The provisional protection lapses in January 2027. Resolving whether Thyspunt is, in fact, a cultural landscape of national significance is at the crux of the issue.</u>
<u>k) Viable mitigation and management measures must be described for all impacts. The mitigation measures must be explicitly described for each impact, as opposed to a generic description per broad impact category.</u>	<u>The FSR confirms that specialist studies undertaken during the EIA phase will identify and assess impacts individually, including the development of specific, impact-based mitigation and management measures rather than relying on generic mitigation approaches, to ensure defensible and project-specific environmental management.</u> <u>These mitigation and management measures will be outlined in a detailed Environmental Management Programme (EMPr) that will accompany the draft EIA Report.</u>
<u>"3. Alternatives</u> <u>Please note that Appendix 2(2)(1)(g)(x) of the EIA Regulations, requires that "if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such" must be included in the SR. You are therefore required to provide motivation, should other alternative sites, routes, layouts, and technologies not be considered."</u>	<u>The FSR identifies and assesses site, layout and technology alternatives in accordance with Appendix 2 requirements and provides motivation for focusing on Thyspunt and Bantamsklip based on historical screening and current planning considerations, with Thyspunt identified as the preferred site on balance. The assessment also considers alternative configurations within the Plant Parameter Envelope, as well as comparative infrastructure options (e.g. cooling systems, desalination approaches and layout variations), with these alternatives to be further refined and comparatively assessed during the EIA phase, and any exclusions clearly motivated in line with the EIA Regulations.</u> <u>The alternatives considered in the Scoping Report are outlined in Section 6. The preferred alternatives and required motivations are included in Section 11.4.</u>
<u>"4. Layout & Sensitivity Maps</u> <u>a) The final layout map must indicate the following (but not limited to the below):</u> ■ <u>The NPP development area.</u> ■ <u>Final position of all infrastructure e.g., reactor containment buildings, intake structures, desalination plant, fuel storage, H2 plant, HV Yard, Access routes etc.</u> ■ <u>Permanent laydown area footprint.</u> ■ <u>All supporting onsite infrastructure e.g., laydown areas, roads, (existing and proposed).</u> ■ <u>All existing infrastructure on the site.</u>	<u>The final layout map will be included in the Draft EIA Report. The requirements for the map are noted and will be complied with.</u>

DFFE Comment	EAP Response
▪ <u>The location of sensitive environmental features on site e.g., CBAs, ESAs, visually sensitive areas, heritage sites, wetlands, drainage lines etc. that will be affected.</u> ▪ <u>Buffer areas recommended by specialists; and</u> ▪ <u>All “no-go” and exclusion areas. ”</u>	
b) Please ensure that the above map has a clear legend that communicates with details of the map and is at an appropriate scale.	The final layout map will be included in the Draft EIA Report. Notably the requirement that the map must have a clear legend that communicates with details of the map and is at an appropriate scale will be complied with.
c) The above map must be overlain with a sensitivity map and a cumulative map.	The final layout map will be included in the Draft EIA Report. Notably the requirement that the map must be overlain with a sensitivity map and a cumulative map will be complied with.
d) It must be emphasised that the final EIAR must include a final layout map of the preferred site which adheres to specialist recommendations as well as the identified no-go areas and buffer zones.	The final EIAR will include a final layout map of the preferred site which adheres to specialist recommendations as well as the identified no-go areas and buffer zones.
e) Include a description of the process to determine the finalised layout i.e. specialist considerations, site sensitivities etc	The draft EIA Report will include a description of the process to determine the finalised layout i.e. specialist considerations, site sensitivities etc
f) The current figures contained within the draft SR are not legible when zoomed into for e.g. Preliminary site footprint maps as Figure 6.12 and 6.13. Level of detail is lost and therefore difficult to interpret. Please include a separate appendix which contains all relevant mapping information. Ensure that clear, legible maps of high resolution are provided.	The comment regarding mapping in the DSR is acknowledged. Appendix N has been included in the FSR which includes all relevant mapping information.
<u>"5. Specialist Assessments to be conducted in the EIA Phase</u> a) All specialists must assess the PPE approach to ensure that their findings are consistent with the proposed technology. Once a preferred technology is chosen, the specialists must ensure that their findings, mitigations and recommendations align. Furthermore, specialists must indicate whether further fieldwork, ground truthing, data collection etc will be undertaken to update the desktop information used as baseline for their reports."	The FSR confirms that the Plant Parameter Envelope (PPE) approach will guide all specialist assessments using a worst-case scenario framework applicable to a range of reactor technologies, with findings, mitigation measures and recommendations to be refined and aligned once a preferred technology is selected during subsequent project phases. Additionally, the EIA phase will include updated specialist investigations, including fieldwork, ground-truthing and further data collection where required, to verify baseline conditions and strengthen the assessment beyond the desktop studies presented in the Scoping Report.
b) Specialist studies to be conducted must provide a detailed description of their methodology, as well as indicate the locations and descriptions of all infrastructure that they have assessed and are recommending for authorisation.	The specialist studies to be conducted during the EIA phase will provide a detailed description of their methodology, as well as indicate the locations and descriptions of all infrastructure that they have assessed and are recommending for authorisation.
c) The specialist studies must also provide a detailed description of all limitations to their studies. All specialist studies must be conducted in the right season and providing that as a limitation, will not be accepted.	The specialist studies to be conducted during the EIA phase will also provide a detailed description of all limitations to their studies. All specialist studies must be conducted in the right season. The scoping phase assumptions and limitations are outlined in Section 2.7 of the FSR.
d) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defensible reasons; and were necessary, include further expertise advice.	This comment is acknowledged. There are currently no contradicting recommendations prescribed by specialists

DFFE Comment	EAP Response
<u>e) The Environmental Assessment Practitioner (EAP) must ensure effective alignment and consistent coordination between all involved specialists. This is required to ensure that the impact methodologies, weighting criteria, assessments and mitigation measures proposed are technically sound, realistic, achievable, and mutually compatible, and that they do not compromise or contradict the recommendations of any specialist discipline.</u>	The FSR outlines that the EAP is responsible for integrating specialist inputs and ensuring that all assessments are undertaken within a coordinated framework, with consistent methodologies and alignment of findings across disciplines. Accordingly, the EIA phase will include iterative review, internal integration and quality assurance processes to ensure that specialist recommendations, mitigation measures and impact ratings are technically robust, compatible and do not conflict across disciplines.
<u>f) The EAP/applicant must ensure compliance with the applicable legislations and associated regulations when managing and handling radioactive waste. The waste management hierarchy must also be assessed. Storage of waste on site must be in conjunction with the latest legislative requirements in terms on the Waste Act and any other applicable legislation/Regulations.</u>	The FSR confirms that radioactive waste associated with the proposed NPP will be managed in accordance with applicable legislative frameworks, including the National Environmental Management: Waste Act (Act 59 of 2008), the National Nuclear Regulator Act (Act 47 of 1999), and relevant regulations governing radioactive waste management. The EIA phase will further assess waste management practices in line with the waste hierarchy and applicable regulatory requirements, including storage, handling and disposal arrangements, to ensure compliance with national legislation and international best practice.
<u>g) The final SR and the Radioactive Waste and Transport Assessment (Appendix G22) must clearly describe procedures undertaken during routine maintenance shutdowns and assess the potential risks of radioactive contaminant releases, including via water, steam and transport. The SR must further evaluate the environmental risks associated with potential leakage of radioactive liquids from spent fuel pools and clearly identify and map the discharge points at both proposed sites.</u>	The Radioactive Waste and Transport Assessment will not include quantitative dose or risk assessments for releases to the environment, whether gaseous, liquid, or solid, at the two proposed sites, during transport, or during disposal at Vaalputs. These aspects fall within the scope of the Site Safety Report, which is prepared as part of the National Nuclear Regulator process. The assessment will include a section outlining the requirements and guidance applicable to a Radioactive Waste Management Programme for a nuclear power plant, including relevant international guidance such as IAEA SSG-40. This will be followed by an overview and evaluation of the Radioactive Waste Management Programme currently implemented at Koeberg Nuclear Power Station, where relevant to the issues under consideration. Spent nuclear fuel storage will be addressed in a similar manner, focusing on applicable requirements and guidance, together with an overview of how these arrangements are implemented at Koeberg Nuclear Power Station. The assessment will also apply a similar approach to the transport of radioactive waste from the site to Vaalputs. This will include consideration of applicable IAEA requirements and guidance, as well as relevant Eskom procedures, including procedures for emergency management during transport.
<u>h) It is further brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. “the Protocols”), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. Please note that specialist assessments</u>	The specialists that conducted the site assessment and prepared the Scoping report are SACNASP registered and their SACNASP information is included in the Scoping report appendices and have been provided independently to WSP. The specialist qualifications and registrations are outlined in Section 1.5.5 and proof is included in Appendix E of the FSR.

DFFE Comment	EAP Response
<u>must be conducted in accordance with these protocols. Please note further that the protocols require the specialists' to be registered with SACNASP in their respective field.</u>	
<u>"i) The screening tool output:</u> <u>The screening tool and the gazetted protocols (GN R320 of 20 March 2020 and GN R 1150 of 30 October 2020) require a site sensitivity verification to be completed to either confirm or dispute the findings and sensitivity ratings of the screening tool.</u> <u>Site sensitivity verifications for all the identified specialist studies (according to the screening tool) must be provided."</u>	<u>The Site Sensitivity Verification Report is included in Appendix I and is summarised in Section 9 of the FSR.</u>
<u>j) The Air Quality Assessment (Appendix G.6) states that meteorological data not older than 5 years is required for dispersion modelling. This assessment must ensure that valid meteorological data is used to ensure the findings depict the current status of both the sites, until a preferred site is selected.</u>	<u>The air quality impact assessment will use more recent meteorological data, covering the period January 2023 to December 2025.</u>
<u>k) Please ensure that the naming of specialist studies is consistent throughout the document, including in-text references and PDF file titles. For example, Appendix G.7 is provided as a PDF titled "Freshwater Ecology Scoping Report," whereas the report itself is titled "Aquatic Specialist Study: Scoping Phase." Consistent naming must be applied across all reports and referenced documents.</u>	<u>This comment is acknowledged. The FSR has been updated as required.</u>
<u>l) The Avifauna (Appendix G.11) and Visual impact assessment reports (Appendix G.15) do not mention whether previous assessments were used as reference material. Please can you clarify this.</u>	<u>The previous visual impact assessment report, ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED NUCLEAR POWER STATION ('NUCLEAR 1') AND ASSOCIATED INFRASTRUCTURE: Visual Impact Assessment, March 2013 prepared by Bapela Cave Klapwijk, was used as reference material. This will be noted in the revised Scoping Report</u> <u>The Avifauna Scoping Assessment did not use previous assessments during this report."</u>
<u>m) The Marine Ecology Report (Appendix G12) states that the establishment of marine Biodiversity exclusion zones around the proposed NPP site at Thyspunt is expected to result in localised impacts on the commercial chokka squid fishery due to the loss of access to intensively utilised nearshore fishing grounds. This impact is assessed as being of Moderate significance, with low cumulative impact, and it is further stated that no practical mitigation measures are available to reduce this significance. The basis for assigning a 'Moderate' significance rating after mitigation, as well as a 'low' cumulative significance for combined pressures on the marine and coastal environment, must be clearly demonstrated. In addition, it must be confirmed whether the same impact significance rating methodology and tables applied by the EAP across the EIA have been used, or alternatively, any</u>	<u>"Mitigation measures for potential impacts on the commercial chokka squid fishery were explored during the Scoping Phase and, where considered feasible and appropriate at this stage of the assessment, were incorporated into the impact assessment and significance ratings accordingly. It is acknowledged that the assessment remains preliminary, and further investigation into the feasibility, effectiveness, and implementation of additional mitigation measures will be undertaken during the Impact Assessment Phase as more detailed project and environmental information becomes available.</u> <u>Cumulative impacts were assessed within the broader context of the overall project lifecycle and in combination with other existing and foreseeable pressures on the marine and coastal environment. The assigned cumulative impact ratings therefore reflect the anticipated contribution of the proposed development within the wider regional and temporal context considered appropriate for the Scoping Phase assessment.</u>

DFFE Comment	EAP Response
<u>deviations must be clearly justified and documented.</u> <u>"(n) The Marine Ecology Report (Appendix G12) provides a broad desktop-based overview of the receiving marine environment and identifies a range of potential impacts, however, these are constrained by reliance on secondary information, limited site-specific baseline data, and insufficient quantitative assessment of key impact pathways. Several conclusions, including impact significance ratings and site-level comparisons, are not adequately supported by empirical evidence, and the influence of assumptions and uncertainties on impact outcomes is not consistently or transparently discussed. This limits confidence in the preliminary findings, particularly for impacts associated with seawater intake and discharge infrastructure, sediment disturbance, fisheries interactions, underwater noise, thermal effluent discharge, and cumulative effects. EIA-phase submissions must address these shortcomings by:</u> <u>(i) supplementing desktop analyses with site-specific and seasonally representative baseline data, including targeted intertidal and subtidal surveys and updated fisheries data;</u> <u>(ii) quantitatively defining spatial and temporal impact footprints through appropriate modelling (Including hydrodynamic, sediment dispersion, entrainment/impingement, underwater noise and thermal plume modelling);</u> <u>(iii) clearly assessing the sensitivity and vulnerability of Species of Conservation Concern, priority habitats and ecosystem services using defensible thresholds aligned with national policy and international best practice; and</u> <u>(iv) substantially strengthening the cumulative impact assessment by explicitly considering interactions with existing and reasonably foreseeable activities, including fisheries, Marine Protected Areas (MPAs), Ecologically or Biologically Significant Areas (EBSAs), coastal developments and long-term climate change pressures.</u> <u>In addition, the report's discussion of thermal cooling associated with once-through cooling during effluent discharge must be significantly expanded. The Marine Ecology Report notes that such discharge would require motivation under the "exceptional circumstances" provision of the DEA (2014) National Guideline for the Discharge of Effluent from Land-based Sources into the Coastal Environment; however, no substantive justification or supporting analysis is provided. Subsequent report revisions must therefore explicitly assess the ecological implications of thermal effluent discharge, demonstrate whether and how the proposal meets the criteria for "exceptional circumstances," and evaluate feasible alternatives</u>	<u>The impact assessment methodology as detailed in Appendix 2 of the marine ecology and fisheries scoping report was followed. "</u> <u>The desktop-based assessment approach is considered appropriate and consistent with the objectives and level of detail required for the Scoping Phase of the EIA process. At this stage, the assessment is intended to identify key sensitivities, potential impact pathways, and material issues requiring further investigation during the subsequent Impact Assessment Phase. The assessment made use of the best available information, including published scientific literature, regional datasets, specialist knowledge, and evidence from comparable developments and environments where site-specific data were limited. Where confidence in particular impact pathways or conclusions was lower due to data limitations, uncertainty was acknowledged and reflected within the assessment and associated significance ratings. It is recognised that additional site-specific information and stakeholder engagement will strengthen the assessment. Accordingly, the Impact Assessment Phase will include further consultation and engagement with relevant industry representatives, fisheries stakeholders, authorities, and other interested and affected parties to obtain additional insights and refine the understanding of potential impacts. In response to the individual points raised: (i) Intertidal surveys have been undertaken, and since scoping additional catch and effort data (up until 20205) has been acquired and processed and will best inform the socio-economic IA.); (ii) Modelling studies are being undertaken and will be interpreted accordingly by the marine specialists. . (iii, iv) The spatial constraints have been adequately assessed for this site, even for the scoping phase. We have a good level of data, detail ad understanding regarding marine sensitivities in this regard. Final comments. As above, comprehensive modelling assessments are in process and will be interpreted accordingly. Regarding distinguishing between scoping and EIA phase. This will be achieved.</u>

DFFE Comment	EAP Response
<u>and mitigation measures. This must include a clear assessment of potential impacts on marine organisms, habitat functioning, and ecosystem processes, supported by robust modelling and evidence-based justification.</u> <u>Finally, revised submissions must clearly distinguish between provisional scoping-level observations and conclusions that can only be reached once EIA-phase data gaps are addressed. All residual uncertainties, limitations and risks must be explicitly acknowledged, and conclusions regarding impact significance and site suitability must be proportionate to the scale, duration and risk profile of a long-life NPP development."</u>	
<u>"o) Freshwater Ecology Assessment (Appendix G.7): The report explicitly acknowledges that no new biophysical or water quality data were collected, that detailed wetland delineation has not been undertaken, and that several critical project components (including access roads, fencing, spoil disposal, sewage treatment, dewatering volumes, stormwater management, transmission infrastructure, and decommissioning activities) remain undefined. These limitations materially affect the robustness of impact identification and the reliability of impact significance ratings, especially where the report assigns "reducible" or potentially "low" post-mitigation significance to impacts on highly sensitive and, in some cases, irreplaceable aquatic ecosystems.</u> <u>The report must therefore:</u> <u>(i) provide updated, site-specific baseline data, including detailed wetland delineation, freshwater PES (WET-Health) assessments, updated water quality data, and verification of groundwater-surface water interaction pathways, particularly for wetlands of Very High Ecological Importance and Sensitivity;</u> <u>(ii) quantify impact pathways and spatial footprints associated with dewatering, draw-down, stormwater runoff, effluent discharge, spoil placement, access roads, transmission corridors, fencing and construction activities, supported by appropriate hydrogeological and hydrological modelling;</u> <u>(iii) strengthen the justification for impact significance ratings by explicitly linking magnitude, duration, extent and likelihood scores to empirical data, modelling outputs and defensible assumptions, commensurate with the ecological sensitivity and strategic scale of the project;</u> <u>(iv) clearly assess cumulative and indirect impacts, including fragmentation effects, downstream impacts, interactions with transmission infrastructure, induced development pressures, and long-term climate change effects on groundwater-dependent ecosystems; and</u>	<u>The need for detailed impact identification and assessment, and the need for additional detailed on-site assessments have been articulated in Section 7 of the specialist report, along with notes that detailed offset calculations will be included in the EIA phase to assess potential benefits associated with the Thyspunt development in a more quantitative manner. Much more detail is required regarding the proposed development footprint and activities, during both CONstruction and Operational phases. With regard to the need for detailed wetland delineation, this issue is discussed in Section 1.5. Some of the wetlands have however been delineated accurately (e.g. the lower reaches of the Langefonteinvelei and wetlands north of the dunefields) and these data will be included in the EIA. The scale of the site and the extensive size of the wetlands means that on-site surveying of wetland edges would in some cases be damaging to these systems and would not contribute more useful information than that conveyed at present by conservative desktop mapping based on aerial imagery with ground-truthing and localised soil assessments (i.e. where uncertainty exists, wider wetland areas are mapped rather than narrower areas). Concerns regarding site preference for this development are concurred with.</u> <u>The aquatic ecosystem assessment includes (and has allowed for additional EIA phase) site visits to assess watercourse condition and identify where landuse changes might impact on aquatic ecosystem function or condition. The previous studies do however provide extensive detail that has NOT changed - e.g. around watercourse reference conditions. Surface / groundwater interactions were studied in detail between 2011 and 2013 and used to develop a strong model for groundwater dependent wetlands on the site.</u> <u>The specialist scoping report notes the need (Section 6) for the following, to be included in the specialist EIA report:</u> ■ <u>Updating of climate change scenarios, to inform reflection on climate change implications for aquatic ecosystems at both sites;</u> ■ <u>Detailed development footprint and design details for the Bantamsklip site, should this be selected as the candidate to take forward for consideration for development authorization in the EIA – the existing level of development detail available for this site is inadequate to allow for specialist impact assessment at EIA level;</u>

DFFE Comment	EAP Response
<u>(v) clearly distinguish between provisional scoping-level observations and conclusions that are only valid once EIA-phase data gaps have been addressed.</u> <u>Although the report identifies potential conservation gains associated with expanded land stewardship and wetland protection, the methodology used to assess positive impacts is acknowledged to be inadequate and inconsistent with the prescribed significance framework. The EIA-phase assessment must therefore apply a transparent, methodologically robust approach to assessing both negative and positive impacts, ensuring that any claimed conservation benefits are realistic, enforceable, and supported by legally binding commitments, secure land tenure, funded management plans and long-term institutional capacity.</u> <u>Finally, conclusions relating to preferred site selection from a freshwater ecology perspective must be treated with caution. While Bantamsklip is identified as potentially less problematic from an inland aquatic ecosystem perspective, this conclusion remains contingent on confirmation of development layouts, dewatering impacts, and exclusion of any activities north of the R43. At Thyspunt, where wetlands of Very High ecological importance are closely integrated with dynamic dune and groundwater systems, site preference conclusions must be demonstrably supported by EIA-level data, rigorous risk assessment, and clear evidence that identified mitigation measures are feasible, enforceable, and sufficient to prevent irreversible loss of sensitive freshwater ecosystems."</u>	■ <u>For Thyspunt, should it be the preferred site selected for authorization consideration, the following details would be required:</u> • <u>Transmission line and pylon design and alignment details</u> • <u>More detailed road design and alignment details and clarity on the need for a northern road route</u> • <u>Details of proposed perimeter fences – these are considered a potentially serious negative biodiversity impact;</u> • <u>Confirmation of the modelled radius of drawdown for the site, as revised in SRK (2011 to 2013);</u> • <u>Stormwater management design details;</u> • <u>Details of proposed sewage treatment, including predicted effluent quality, quantity and disposal;</u> ■ <u>For both sites, details of Decommissioning activities and confirmation of funding availability;</u> ■ <u>Clarity regarding what a No Development outcome would be at either site – would the land be sold or continue to be managed by Eskom;</u> ■ <u>Confirmation that Eskom would be able to provide the required levels of operational management at either site, to meet conservation objectives on a long-term basis.</u> (i) See above (ii) See above – more detail is indeed required from Eskom to assess these potential impacts. (iii) This is EIA phase input and will definitely be included, with the Precautionary Principle being upheld. (iv) This is EIA phase input and will definitely be included, with the Precautionary Principle being upheld. (v) Fully agreed. Section 7 of the specialist report notes that the EIA phase of the project must include (in the event that Thyspunt is included for further consideration) ■ <u>[Consideration of ...] the Offset Calculator of Macfarlane et al (2017) ... to quantify the degree to which conservation gains for wetlands outside of the development platform would indeed reasonably offset / compensate for losses or degradation of wetlands as a result of the proposed development;</u> <u>These comments are fully agreed with. It must also be noted that the aquatic specialist to date has not commented on or been privy to suggestions for alternative development sites, other than Thyspunt, Duynfontein, Bantamsklip and (previously) the two proposed and then excluded Northern Cape sites.</u>
<u>"p) Terrestrial Biodiversity (Appendix G.9): The report must:</u> <u>(i) substantially strengthen the baseline information through expanded, seasonally representative field surveys, including targeted surveys for terrestrial Species of Conservation Concern, confirmation of habitat condition, and fine-scale verification of vegetation units likely to be affected by all project components, including access roads, internal</u>	<u>The concerns raised are noted and are considered valid within the context of the project currently being at a pre-application/scoping-level assessment. The Terrestrial Biodiversity Assessment will be substantially refined for the selected site during the EIA phase, with additional specialist input, expanded field verification, and footprint-level analysis to ensure full compliance with best practice and regulatory expectations.</u> <u>A point-by-point response is provided below:</u> (i) Baseline strengthening and seasonal representativity

DFFE Comment	EAP Response
<u>corridors, transmission infrastructure, and temporary construction areas;</u> <u>(ii) clearly define and map the full development footprint and associated infrastructure to enable a defensible assessment of direct, indirect and fragmentation impacts on Critical Biodiversity Areas, Ecological Support Areas, protected areas, threatened ecosystems, and Key Biodiversity Areas;</u> <u>(iii) provide a more rigorous and transparent justification for impact significance ratings, explicitly linking magnitude, duration, extent and likelihood scores to empirical data, ecological thresholds, and process-based risk, particularly where “manageable” or reduced post-mitigation significance is assumed in very high-sensitivity landscapes;</u> <u>(iv) strengthen the assessment of ecosystem processes by explicitly evaluating how proposed infrastructure may disrupt fire regimes, dune mobility, wetland–terrestrial connectivity, and landscape-scale ecological corridors, supported where necessary by process-based modelling or scenario analysis; and</u> <u>(v) substantially expand the cumulative impact assessment to account for existing and reasonably foreseeable developments (including renewable energy facilities, grid infrastructure and associated access networks), as well as long-term change drivers such as climate change, invasive alien species spread, and induced development pressures.</u> <u>Although the report outlines potential mitigation and offset mechanisms, these measures are currently presented at a high level and are in some cases premised on assumptions of future planning flexibility (e.g. reconfiguration of layouts, establishment of offsets, or protected area deproclamation). The subsequent report must therefore provide a realistic and critical assessment of mitigation feasibility, explicitly identifying situations where impacts may be effectively unavoidable, where offsets may be constrained by irreplaceability or policy limits, and where residual impacts may remain of high significance despite mitigation.</u> <u>Finally, the site selection recommendation is based primarily on broad comparative sensitivity and habitat diversity considerations and must be treated as provisional. Given that both sites intersect Very High sensitivity landscapes and nationally significant biodiversity features, any preferred alternative conclusion must be supported at EIA-phase by robust, footprint-specific analysis demonstrating avoidance of fatal flaws, legal feasibility, enforceable mitigation, and acceptable residual risk in line with the mitigation hierarchy and NEMA’s precautionary principle.”</u>	<u>The present assessment is based on a combination of targeted field verification, desktop datasets, and habitat-level interpretation, which is appropriate for the current phase of assessment. However, it is acknowledged that:</u> <u>Seasonally representative surveys, including targeted surveys for terrestrial Species of Conservation Concern (SCC), have not yet been fully exhausted.</u> <u>Habitat condition has been characterised at a broad to intermediate scale, rather than fine-scale verification across all infrastructure components.</u> <u>To address this, the EIA phase will include:</u> <u>Multi-season field surveys, timed to coincide with optimal detectability periods for flora SCCs.</u> <u>Targeted SCC surveys in habitats identified as having elevated likelihood of occurrence based on ecological indicators and distribution data.</u> <u>Fine-scale ground-truthing of vegetation units and habitat condition across the entire confirmed development footprint, including for all infrastructure components supplied by the developer.</u> <u>These refinements will ensure a defensible, site-specific ecological baseline, aligned with current assessment protocols and guidelines.</u> <u>ii) Definition and mapping of the development footprint</u> <u>It is acknowledged that the current assessment has been undertaken using a preliminary development envelope, which inherently limits the resolution of impact quantification.</u> <u>During the EIA phase:</u> <u>A final, survey-informed development footprint will be mapped at high spatial resolution.</u> <u>All associated infrastructure will be explicitly delineated, including ancillary and temporary disturbance areas.</u> <u>This will enable:</u> <u>Accurate overlay analyses with CBAs, ESAs, protected areas, threatened ecosystems, and KBAs</u> <u>A quantitative assessment of direct, indirect, and fragmentation impacts</u> <u>Improved edge-effect and connectivity evaluations</u> <u>This refinement is standard practice as projects transition from scoping to detailed design and impact assessment.</u> <u>(iii) Justification of impact significance ratings</u> <u>The comment regarding the need for enhanced transparency in impact rating justification is noted.</u> <u>At present, impact ratings are based on:</u> <u>Established EIA methodology frameworks</u> <u>A precautionary interpretation of ecological sensitivity</u> <u>However, the EIA phase will strengthen this by:</u> <u>Explicitly linking magnitude, duration, extent, and likelihood to:</u> <u>Empirical field data</u> <u>Habitat condition and ecological integrity metrics</u> <u>Known ecological thresholds and species sensitivity</u>

DFFE Comment	EAP Response
	■ Providing clear rationale statements for each impact pathway ■ Differentiating between: • Impacts that are readily mitigable • Impacts that are conditionally manageable • Impacts where residual significance may remain elevated Importantly, in very high sensitivity landscapes, a cautious approach will be taken, and reductions in significance post-mitigation will only be assigned where demonstrably achievable and enforceable. (iv) Assessment of ecosystem processes The current report identifies relevant ecosystem processes but does not yet fully quantify process-level risks. This will be expanded in the EIA phase to include: ■ Fire regime considerations, including potential disruption to natural burn cycles and associated vegetation dynamics ■ Landscape connectivity and corridor functionality, including the role of the site within broader ecological networks ■ Wetland–terrestrial interface dynamics, where applicable In summary, the issues raised by the reviewer are valid for the EIA phase and are not indicative of fatal flaws at the current stage, but rather reflect the need for progressive refinement of the biodiversity assessment as more detailed design information becomes available. The EIA phase has been explicitly scoped to address these requirements and will provide a robust, defensible, and policy-aligned terrestrial biodiversity assessment.
<u>g) The draft SR states on page 269, that a 'Biodiversity Offset Strategy will be included in the draft EIAR.' The report highlights the unique environmental sensitivities of each alternative site, and it is mentioned that for Thyspunt specifically, residual impacts are expected to remain of high significance after mitigation, due to sensitivity not being able to be avoided or mitigated effectively due to location on the coastal dunes (amongst other reasonings). Please provide an update on the Biodiversity Offset Plan which must be finalised in the final EIAR.</u>	The following studies will be undertaken during the EIA to support a defensible EIA-level conclusion and mitigation / offset decision: ■ Refined mapping and micro-siting to demonstrate how high-SEI areas and key functional corridors (including wetland-associated movement corridors) will be avoided or protected. ■ Confirm the above-ground infrastructure (technical components) required for the nuclear power plant, as well as the activities and processes that will occur on site. This will inform the re-assessment of potential impacts and the site layout.
<u>r) Climate Change Impact Assessment (CCIA): The EIA reporting phase must clearly set out, at a high level, the project's anticipated lifecycle greenhouse gas emissions profile (including Scope 1, 2 and relevant Scope 3 emissions), with a concise qualitative indication of whether the proposed nuclear power plant is expected to increase or reduce emissions relative to the existing grid baseline, in line with Appendix 6 of the EIA Regulations. The report must explicitly identify and describe reasonable and feasible project-level, climate-relevant alternatives to be assessed (including site positioning, layout and design options, technology-envelope choices, cooling system configurations, and key operational</u>	The CCIA Scoping Report addresses the DFFE requirements at scoping level and identifies the relevant matters to be assessed in further detail during the EIA phase. No substantive reworking of the assessment is required. If the Plan of Study is to be updated, this would be limited to a targeted terminology and alignment update to mirror the specific wording used by DFFE and to make the EIA-phase commitments explicit. In particular: • "existing grid baseline" is addressed through the avoided-emissions / coal-displacement baseline • "grid decarbonisation" is addressed through future grid trajectory, electricity mix and coal-retirement assumptions:

DFFE Comment	EAP Response
<u>measures), and explain how these alternatives may influence greenhouse gas (GHG) emissions and climate resilience. The CCIA must demonstrate how lifecycle and cumulative emissions will be assessed in relation to South Africa's climate policy framework, including the Nationally Determined Contribution, carbon budgets, and Paris Agreement commitments. The methodology section must summarise key data and information requirements (such as material quantities, energy use, transport assumptions and emission factors) and indicate whether future climate and energy scenarios, including grid decarbonisation, will be considered. In addition, the assessment must move beyond generic hazard identification to include a screening-level climate risk and vulnerability assessment specific to the proposed NPP, identifying material risks, key impact pathways and infrastructure interdependencies, high-impact low-probability events, and the implications of climate risks (notably sea-level rise and coastal storm surges) for design, construction, operation, safety and long-term resilience, supported by a dedicated feasibility study addressing climate change risks across the full project lifecycle.</u>	• <u>"cooling system configurations" is addressed through the PPE, cooling-water infrastructure, seawater temperature, intake/discharge and water-demand considerations; and the</u> • <u>"dedicated feasibility study" requirement is addressed through the full EIA-phase CCIA and climate vulnerability/resilience assessment, although it is not labelled as a feasibility study in the Scoping Report.</u> <u>Section 6.1 of the CCIA provides a preliminary lifecycle GHG inventory, and Section 8.1 confirms that the EIA-phase CCIA will quantify lifecycle emissions across construction, operation and decommissioning.</u> <u>Section 6.2 of the CCIA provides an avoided-emissions assessment based on displacement of more emissions-intensive grid electricity, particularly coal-fired generation. The EIA-phase CCIA will refine this against future grid dispatch, electricity mix and coal-retirement assumptions.</u> <u>Sections 2.1, 2.2, 4.1.2 and Table 3 of the CCIA identify the site alternatives, PPE/technology envelope, design and layout considerations, cooling-related options and operational measures to be assessed further during the EIA phase.</u> <u>Sections 3.3, 4.1, 4.1.1 and 8.1 of the CCIA confirm that project-level lifecycle and cumulative emissions will be contextualised against South Africa's national GHG inventory, emissions trajectory, carbon-budget framework, NDC and Paris Agreement commitments.</u> <u>Section 6.1 and Table 4 of the CCIA set out the preliminary emissions methodology and lifecycle emission factors. Section 8.1 confirms that the EIA-phase CCIA will document material quantities, transport/logistics assumptions, auxiliary energy requirements, emission factors, data sources and decommissioning boundaries.</u> <u>Sections 5.2, 7.2 and 8.2 of the CCIA address future climate projections. Section 6.2 confirms that avoided-emissions assumptions will be refined with reference to future grid dispatch, electricity mix and coal-retirement pathways, which will include consideration of grid decarbonisation where relevant.</u> <u>Sections 7.1 to 7.3 of the CCIA provide site-specific baseline conditions, projections and vulnerability screening for Bantamsklip and Thyspunt, and Annexure A provides scoping-level physical climate risk ratings.</u> <u>Sections 7.3 and 8.2 of the CCIA identify material risks, including heat, water stress, drought, extreme rainfall, wildfire, coastal processes and infrastructure interdependencies involving cooling systems, water supply, transmission, access, waste logistics and emergency response.</u> <u>Sections 7.2.1.4, 7.2.2.4, 8.2 and Annexure A of the CCIA identify HILP events, including extreme storm surge and compound coastal flooding, as relevant risks for long-lived, safety-critical coastal infrastructure.</u> <u>Sections 7.2.1.4, 7.2.2.4, 7.3, 8.2 and Annexure A of the CCIA address sea-level rise, storm surge, coastal erosion, wave action, compound coastal flooding, sea surface</u>

DFFE Comment	EAP Response
	<u>temperature and intake seawater temperature as matters for detailed EIA-phase assessment.</u> <u>Section 8 recommends a full project-level CCIA comprising a detailed GHG inventory, vulnerability and resilience assessment, and mitigation/adaptation measures. Section 8.2 confirms that climate risks will be assessed across the full lifecycle, including construction, operation, decommissioning and relevant post-operational phases.</u>
<u>s) Traffic Impact Assessment: The EIA-phase Transport Impact Assessment must provide a detailed and definitive assessment of the significance of all transport-related impacts identified at scoping across the full project lifecycle, including construction, operation and decommissioning. The report must explicitly demonstrate compliance with the EIA Regulations by clearly linking legislative and regulatory requirements to the assessment approach and findings. All assumptions and limitations identified at scoping—such as reliance on outdated traffic data, the exclusion of laydown areas and worker accommodation, deferred consideration of decommissioning transport impacts, assumptions regarding radioactive waste and nuclear fuel transport, and the limited assessment of non-road transport modes—must be revisited and refined. Updated data confirmed project information, and expanded consideration of relevant transport modes must be incorporated, and the implications of remaining uncertainties for the reliability of impact predictions must be clearly explained. This should be supported by robust scenario and sensitivity analysis to ensure that the final transport impact predictions are credible, defensible, and adequate to support informed decision-making.</u>	<u>The comment regarding the TIA is noted. The Traffic Impact Assessment (TIA) in the Assessment Phase, will provide a detail assessment of all transport related impacts.</u>
<u>t) Noise Impact Assessment: The Department notes that the Noise Impact Assessment concludes that Bantamsklip is the preferred site from an environmental acoustic perspective, based on a comparative desktop assessment indicating lower surrounding receptor sensitivity and lower anticipated impact ratings relative to the alternative site. However, this conclusion is of limited confidence, as it is derived without baseline noise monitoring. The specialist report confirms that baseline data have not yet been collected and that receptor characteristics may change over time, which could materially affect sensitivity classifications and impact significance. In the absence of verified baseline conditions, the basis for assigning a definitive site preference or comparative acoustic advantage between sites is therefore questioned at this stage.</u>	<u>The site sensitivity classification for the scoping phase was based solely on the distance of nearest receptors to the proposed sites. It is noted that the baseline noise climate will play a part in the impact perceived at receptors, but since both sites are remotely located with mainly natural sources of noise at both locations and similar noise climates expected, the assessment of impacts at this stage were based only on the distance from the source.</u>
<u>u) Town Planning: The forthcoming town planning specialist report must strengthen its scope and methodological clarity by clearly defining assessment criteria, data sources, assumptions and limitations, including those related to cadastral information, zoning status, reliance on draft SDFs,</u>	<u>The Town Planning Specialist Report will be strengthened by clearly defining assessment criteria, data sources, assumptions, and limitations, including those related to cadastral information, zoning, and reliance on SDFs. The legislative and policy framework will be expanded to address applicable planning instruments, although it is noted that</u>

DFFE Comment	EAP Response
<u>and potential future municipal planning changes. The legislative and policy framework must be expanded to explicitly address all applicable planning instruments, including municipal land use schemes, zoning and overlay controls (such as EMOZ at Bantamsklip), and relevant provincial planning legislation. The receiving environment description must provide a clear account of existing zoning, land use rights, cadastral status and scheme compliance for both sites, rather than deferring this analysis. Impact significance ratings and mitigation measures must be specific, realistic and implementable, with a clear assessment of associated risks, uncertainties, costs, commitments and consequences should proposed measures (such as MSDF amendments) not be approved. The report must also expand on cumulative planning implications, including induced development, settlement pressures, infrastructure corridors, worker accommodation and secondary economic activities. Finally, the conclusion and preferred alternative must be supported by a robust comparative planning justification addressing planning and approval risk, policy alignment, zoning implications and long-term municipal development considerations.</u>	<u>both sites will require rezoning following Environmental Authorisation. The receiving environment will be improved to explicitly describe existing zoning, land use rights, cadastral status, and scheme compliance for both sites. Impact assessment will be refined to clarify planning risks and uncertainties—highlighting higher approval risk for Bantamsklip due to required SDF amendments—and to outline realistic mitigation measures and consequences of non-approval. Finally, cumulative planning considerations and the comparative justification of the preferred alternative will be strengthened, with Thyspunt identified as having lower planning and policy alignment risk due to its inclusion in the approved SDF.</u>
<u>"6. Public Participation Process (PPP)</u> <u>a) It is noted that an Environmental and Social Impact Assessment (ESIA) process with associated Environmental and Social Management Plan (ESMP) for the proposed NPP project at either Thyspunt (Eastern Cape) or Bantamsklip (Western Cape) will be conducted. As a result, a Stakeholder Engagement Plan (SEP) must compile to ensure that the public participation process will comply with international requirements."</u>	<u>The Draft Scoping Report confirms that the public participation process has been aligned with international ESIA requirements, and a Stakeholder Engagement Plan (SEP) and Grievance Mechanism have been compiled and included as Appendix A and Appendix B of the Public Participation Report (Appendix B of the FSR), to support ongoing stakeholder engagement. Accordingly, these instruments ensure that stakeholder engagement is structured, transparent and compliant with both national regulatory requirements and international best practice standards.</u>
<u>b) Please ensure that comments from all relevant stakeholders are submitted to the Department with the final SR. This includes but not limited to the: Provincial Department for both sites, South African Heritage Resources Agency (SAHRA), Earthlife Africa, Eastern Cape Provincial Heritage Resources Authority (ECPHRA); Heritage Western Cape (HWC), Wildlife and Environment Society of SA (WESSA); Local alliances or environmental bodies; South African Civil Aviation Authority, Birdlife South Africa, as well as the affected district and local municipalities.</u>	<u>The Draft scoping report was submitted to all the relevant authorities for comment. All comments received to date have been captured in the Comment and Response Report. Comments have been received from the following stakeholders (amongst others) during the public review period:</u> ■ <u>Botanical Society Of South Africa</u> ■ <u>Cape Nature</u> ■ <u>Coega Development Corporation</u> ■ <u>Department of Energy and Electricity</u> ■ <u>Department of Sport, Recreation, Arts and Culture: Museums & Heritage</u> ■ <u>Department of Water and Sanitation</u> ■ <u>Earthlife Africa,</u> ■ <u>Eastern Cape Combined Environmental Forum</u> ■ <u>Eastern Cape Development Corporation</u> ■ <u>ECPHRA</u> ■ <u>SAHRA,</u> ■ <u>Knysna Municipal Offices</u> ■ <u>Kouga Local Municipality</u> ■ <u>Kouga Business Forum</u> ■ <u>Mossel Bay Municipality</u> ■ <u>Nelson Mandela Bay Municipality</u> ■ <u>Nelson Mandela Bay Business Chamber</u>

DFFE Comment	EAP Response
	- Overstrand Local Municipality - South African National Parks - Thyspunt Alliance - Thyspunt Nuclear Development Foundation - WESSA - World Wildlife Fund (WWF) Engagement with key stakeholders will continue into the EIA Phase.
<u>"c) Ensure that the various directorates within this Department are included for comment: Air Quality, Climate Change, Oceans and Coast, Hazardous Waste, Water Sources and Wetlands Conservation Directorate, Biodiversity and Conservation and Protected Areas are included as I&APs. The EAP must ensure that written comment is received from all relevant government stakeholders.</u> - Department of Forestry, Fisheries, and the Environment (DFFE): Biodiversity Planning and Conservation (BCAdmin@dffe.gov.za) - Protected Areas Directorate (tnethononda@dffe.gov.za for attention Mr Thivhulawi Nethononda), - Water Sources and Wetlands Conservation Directorate (StanleyT@dffe.gov.za for attention Mr Stanley Tshitwamulomoni) - Climate Change Mitigation – Dr Mapula Tshangela - mtshangela@dffe.gov.za, Faith Nkohla - FNkohla@dffe.gov.za - Hazardous Waste – Matjelele Phaladi - mphaladi@dffe.gov.za - Air Quality – D r Patience Gwaze, Chief Director: Air Quality Management: pgwaze@dffe.gov.za - Oceans and Coast – Lona Nondaka - lnondaka@dffe.gov.za; Jessica Mans - JeMans@dffe.gov.za"	It is confirmed that all the requested government stakeholders listed are included on the stakeholder database. To date comments have been received from the Protected Areas Directorate and Oceans & Coast Branch. Engagement with key stakeholders will continue into the EIA Phase.
<u>d) Proof of correspondence with the various stakeholders must be included in the final SR. Should you be unable to obtain comments, proof must be submitted to the Department of the attempts that were made to obtain comments.</u>	The Draft scoping report was submitted to all the I&APs for comment. All comments received to date have been captured on this CRR. Proof of the correspondence is included in the public Participation Report (Appendix B of the FSR)
<u>e) During public participation, it was reported that some Interested and Affected Parties (I&APs) experienced difficulties accessing certain project documents. The EAP must ensure that all documents pertaining to the proposed development are fully accessible and free of technical errors, and that any access issues are resolved promptly so that I&APs are not prejudiced in submitting comments within the prescribed timeframe.</u>	The project documentation, including the specialist reports are made available (from 01 April 2026, date of public review period commencing) for download via the project's online document portals (WSP Website and the WSP datafree website), noting that the reports are typically too large to distribute by email. The project website and the associated data-free website were regularly checked and any identified technical issues were immediately fixed to ensure that the online portals were fully operational and that all documents were accessible and downloadable during the public review period. It must be noted that less than ten (10) I&APs notified WSP of accessibility issues. In addition to online access, printed copies were made available at the public venues listed below: Hermanus Public Library - 1 Magnolia St, Hermanus, 7200

DFFE Comment	EAP Response
	- Stanford Public Library - 155 Queen Victoria St, Stanford, 7210 - Gansbaai Public Library - C/O Main and Kapokblom St, Gansbaai, 7220 - Eluxolweni Public Library - 3 Holomisa Street, Eluxolweni, Pearly Beach, 7220 - Buffeljachtsbaai Public Library - Buffeljachtsbaai - Bredasdorp Public Library - 5 Church St, Bredasdorp, 7280 - Welverdiend Library - 56 Ou Meule St, Bredasdorp, 7280 - Oesterbaai Eiendomme – 6 Torny St, Oysterbay - Kouga Local Municipality - Assisi Dr, St Francis Bay, 6312 - Sea Vista Library - Geelbek St, St Francis Bay, 6312 - The Coastal Collective - 2 Suffolk Lane, Cape St Francis, 6313 - St Francis Bay Golf Club Restaurant - 556 Lyme Rd S, St Francis Bay, 6312 - Humansdorp Public Library - 9 Bureau St, Humansdorp, 6300 - Jeffreys Bay Public Library - 43 Diaz Rd, Jeffreys Bay, 6330 - Eskom Megawatt Park Library - Maxwell Dr, Sunninghill, Sandton, 2157 - WSP Midrand Office - Building 1, Maxwell Office Park, Magwa Cres, Midrand, 1685 - WSP Cape Town Office - C/O Portswood Rd & Beach Rd, Victoria & Alfred Waterfront, Cape Town, 8001 Access to aforementioned was communicated to all registered I&APs at commencement of the Public Participation period.
<u>f) The comments and response trail report (C&R) must be submitted with the final SR and subsequent documentation. The C&R report must incorporate all comments received for this development. Ensure that the ‘Repeat Headers’ is selected for the C&R table. The C&R report must be a separate document from the main report. The comment and responses report must address all comment received and dated chronologically, while allowing the reader to follow how the issues have been addressed and translated into the report findings. The report must include responses to the I&APs.</u>	All comments and issues raised from the DSR public review, have been captured verbatim in the Comment and Response Report. Responses have been provided for each comment received. The Comment and Response Report is included in the Public Participation Report (Appendix B of the FSR). The Comment and Response Report has been submitted as a separate document from the main report and is included in the Public Participation Report (Appendix B of the FSR). The comment and responses report addresses all comments received and are dated chronologically, allowing the reader to follow how the issues have been addressed and translated into the report findings.
<u>g) Please ensure that all issues raised, and comments received during the circulation of the SR from registered I&APs and organs of state which have jurisdiction (including this Department’s comments) in respect of the proposed activity are adequately addressed. Comments made by I&APs must be comprehensively captured (copy verbatim if required) and responded to clearly and fully. Please note that a response such as “Noted” is not regarded as an adequate response to I&AP’s comments.</u>	All comments and issues raised from the DSR public review, have been captured verbatim in the Comment and Response Report. The Comment and Response Report is included in the Public Participation Report (Appendix B of the FSR). Furthermore, all the original comments are also included in the Public Participation Report (Appendix B of the FSR).
<u>h) The Public Participation Process must be conducted in terms of Regulations 39, 40, 41, 42, 43 & 44 of the EIA Regulations.</u>	WSP can confirm that the PPP was conducted in terms of Regulation 39, 40 41, 42, 43 and 44 of the EIA Regulations 2014, as amended.
<u>"7. Impact Assessment:</u>	The FSR provides for a comparative assessment of impacts across both Thyspunt and Bantamsklip, with all specialist

DFFE Comment	EAP Response
<u>Impacts must be equitably and comparatively assessed across both sites to ensure there is no bias."</u>	studies required to apply a consistent methodology, impact criteria, and significance ratings to ensure an equitable and unbiased evaluation of alternatives. Accordingly, the EIA phase will refine this approach by assessing the identified alternatives (including layout, design and infrastructure options) on a consistent and comparable basis to support transparent and defensible decision-making.
<u>"8. Cumulative Assessment to be conducted in the EIA Phase</u> <u>Cumulative impact assessment for all identified and assessed impacts must be refined to indicate the following:</u> ■ Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land. ■ Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project. ■ The cumulative impacts significance rating must also inform the need and desirability of the proposed development. ■ A cumulative impact environmental statement on whether the proposed development must proceed."	The FSR confirms that cumulative impacts have been identified at a preliminary level and will be comprehensively refined during the EIA phase through detailed specialist assessments and integrated analysis. This will include explicit definition and, where feasible, quantification of cumulative impacts, transparent documentation of how existing developments and specialist inputs have informed the assessment, and the application of consistent significance ratings. Furthermore, the cumulative impact assessment will inform the overall need and desirability of the project and culminate in a consolidated environmental statement to support decision-making by the competent authority.
<u>"General</u> <u>You are reminded to comply with Regulation 21(1) of the EIA Regulations, which states that:</u> <u>"If S&EIR must be applied to an application, the applicant must, within 44 days of receipt of the application by the competent authority, submit to the competent authority a SR which has been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority."</u> <u>You are further reminded that the final SR to be submitted to this Department must comply with all the requirements in terms of the scope of assessment and content of the SR in accordance with Appendix 2 and Regulation 21(1) of the EIA Regulations.</u> <u>The EAP must include a project schedule, indicating the timeframes associated with the further roll-out of this project. If possible, the EAP must initiate a folder structure, which groups documents together for e.g. Appendix B: Specialist Studies; Appendix C: PPP.</u> <u>Further note that in terms of Regulation 45 of the EIA Regulations, this application will lapse if the applicant fails to meet any of the timeframes</u>	WSP confirms that the FSR will be submitted to the DFFE in line with the regulated timeframes. A letter for an extension request in terms of Regulation 3(7) of the 2014 NEMA EIA Regulations, as amended (the EIA Regulations) was submitted to the DFFE on 20 April 2026, to request a 30-day extension of the prescribed forty-four (44) day timeframe within which the final SR is to be submitted to the DFFE. The motivation for the request was based on concerns raised by interested and affected parties (I&APs) indicating that the statutory 30-day timeframe was insufficient to review the volume and technical nature of information made available during the scoping phase. The DFFE approved the request. Of the 30-days, 20-days were allocated to the public for review and the remaining 10-days were retained for considered of the anticipated volume of comments. However, due to the floods that occurred in the Eastern Cape towards the end of the first week of May 2026, a couple of key meetings had to be postponed and the public review period was again extend by an additional 4 days (review ending on 29 May 2026) such that these meeting could be rescheduled. A second letter for an extension request in terms of Regulation 3(7) of the 2014 NEMA EIA Regulations, as amended (the EIA Regulations) was submitted to the DFFE on 4 June 2026, to request a further 35-day extension of the prescribed timeframe within which the final SR is to be submitted to the DFFE. The motivation for the request was based on the high level of stakeholder interest, reflected in

DFFE Comment	EAP Response
<u>prescribed in terms of these Regulations, unless an extension has been granted in terms of Regulation 3(7).</u> <u>You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an Environmental Authorisation being granted by the Department. "</u>	<u>the volume and substantial nature of comments received from I&APs, an extension was required to allow the EAP and Applicant sufficient time to finalise the comment-and-response report and revise the scoping report. The DFFE approved the request and the FSR is now due to be submitted on 23 July 2026.</u> <u>WSP confirms that the FSR will be submitted to the DFFE in line with the requirements in terms of the scope of assessment and content of Scoping reports in accordance with Appendix 2 and Regulation 21(1) of the EIA Regulations 2014, as amended.</u> <u>Figure 2-1 of the FSR includes a project schedule, indicating the timeframes associated with the further roll-out of this project.</u> <u>WSP notes that the application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of these Regulations.</u> <u>The applicant is fully aware that that no activity may commence prior to an Environmental Authorisation being granted by the Department.</u>

ACRONYMS

Acronym	Definition
AADQ	Annual Authorised Discharge Quantities
AEL	Atmospheric Emission Licence
AGFDL	<u>Africa Great Future Development Ltd</u>
ALARA	As Low As Reasonably Achievable
AMS	Annual Maximum Series
AQMP	Air Quality Management Plan
BESS	Battery Energy Storage Systems
BWR	Boiling Water Reactor
CA	Competent Authority
CBD	Central Business District
CBA	Critical Biodiversity Area
CCGT	Combined Cycle Gas Turbine
CCIA	Climate Change Impact Assessment
CEF	<u>Central Energy Fund</u>
CEM	Continuous Emissions Monitoring
CIGS	<u>Copper-Indium-Gallium-Diselenide</u>
CO ₂	Carbon Dioxide
CSP	Concentrating Solar Power
DBA	Design Basis Accident
DEA	Department of Environmental Affairs (now DFFE)
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DFFE	Department of Forestry, Fisheries and the Environment
DGR	<u>Deep Geological Repositories</u>
DMPR	Department of Mineral and Petroleum Resources
DSR	Draft Scoping Report
DSM	Demand Side Management
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
ECA	Environment Conservation Act, 1989 (Act No. 73 of 1989)
ECPHRA	Eastern Cape Provincial Heritage Resources Authority
EE	Energy Efficiency

Acronym	Definition
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMPr	Environmental Management Programme
EMS	Environmental Management System
EMF	Environmental Management Framework
EOP	Emergency Operating Procedures
EPZ	Emergency Planning Zone
ESA	Ecological Support Area
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESP	Early Site Permit
EVA	Extreme Value Analysis
FSR	Final Scoping Report
GHGs	Greenhouse Gases
GIIP	Good International Industry Practice
GNR	Government Notice Regulation
GWh	Gigawatt-hour
HAT	Highest Astronomical Tide
HLW	High-Level Waste
HRIA	Human Rights Impact Assessment
HTGR	High Temperature Gas-cooled Reactor
HV	High Voltage
IAEA	International Atomic Energy Agency
ICMA	Integrated Coastal Management Act
ICRP	International Commission on Radiological Protection
IDP	Integrated Development Plan
IEP	Integrated Energy Plan
ILW	Intermediate-Level Waste
INES	International Nuclear Event Scale
IPP	Independent Power Producer
IRP	Integrated Resource Plan
JET	Just Energy Transition
KBA	Key Biodiversity Area
kV	Kilovolt
LLW	Low-Level Waste

Acronym	Definition
LSDF	Local Spatial Development Framework
LV	Low Voltage
MAP	Mean Annual Precipitation
MFMA	Municipal Finance Management Act
MHI	Major Hazard Installation
MSDF	Municipal Spatial Development Framework
MTS	<u>Main Transmission Substation</u>
MWe	Megawatt electrical
MWth	Megawatt thermal
NEMA	National Environmental Management Act, 1998
NECSA	Nuclear Energy Corporation of South Africa
NERSA	National Energy Regulator of South Africa
NISL	Nuclear Installation Site Licence
NKPA	National Key Points Act
NNR	National Nuclear Regulator
NNRA	National Nuclear Regulator Act
NPP	Nuclear Power Plant
NRWDI	National Radioactive Waste Disposal Institute
NSIP	Nuclear Site Investigation Programme
OCGT	Open-Cycle Gas Turbine
OHSA	Occupational Health and Safety Act
PAOI	Project Area of Influence
PAZ	Protective Action Zone
PDALA	Preservation and Development of Agricultural Land Act
PPE	Personal Protective Equipment
PPA	Power Purchase Agreement
PV	Photovoltaic
RSA	Republic of South Africa
REIPPP	<u>Renewable Energy Independent Power Producer Programme</u>
SANBI	South African National Biodiversity Institute
SAHRA	South African Heritage Resources Agency
SACAA	South African Civil Aviation Authority
SANS	South African National Standards
SAWS	South African Weather Service
SCADA	Supervisory Control and Data Acquisition

Acronym	Definition
SDG	Sustainable Development Goal
SEIR	Scoping and Environmental Impact Reporting
SEP	Stakeholder Engagement Plan
<u>SEZ</u>	<u>Special Economic Zone</u>
SIP	<u>Strategic Integrated Project</u>
SMR	Small Modular Reactor
SPLUMA	Spatial Planning and Land Use Management Act, 2013
SSR	Site Safety Report
ToR	Terms of Reference
TWh	Terawatt-hour
UPZ	Urgent Protective Zone
VEC	Valued Environmental Component
WSP	WSP Group Africa
WWTP	Wastewater Treatment Plant
ZAR	South African Rand

CONTENTS

1	INTRODUCTION	1
1.1	PURPOSE OF THIS REPORT	1
1.2	BACKGROUND INFORMATION	1
1.3	PROJECT LOCATION	4
1.4	NUCLEAR INSTALLATION LICENCE PROCESS	11
1.5	DETAILS OF KEY ROLE PLAYERS	13
1.6	SCOPING TERMS OF REFERENCE	22
1.7	FINAL SCOPING REPORT STRUCTURE	23
2	S&EIA PROCESS	27
2.1	OBJECTIVES OF THE S&EIR PROCESS AS PER THE PROCEDURAL FRAMEWORK	27
2.2	DFFE WEB-BASED ENVIRONMENTAL SCREENING TOOL	28
2.3	APPLICATION FOR ENVIRONMENTAL AUTHORISATION	33
2.4	BASELINE ENVIRONMENTAL ASSESSMENT	34
2.5	IMPACT ASSESSMENT METHODOLOGY	34
2.6	STAKEHOLDER ENGAGEMENT PROCESS	39
2.7	ASSUMPTIONS AND LIMITATIONS	59
3	NUCLEAR POWER CONTEXT	74
3.1	INTRODUCTION AND BACKGROUND	74
3.2	NUCLEAR POWER ²⁵	74
3.3	HISTORY OF NUCLEAR POWER PLANTS	75
3.4	NUCLEAR TECHNOLOGY EVOLUTION	76
3.5	NUCLEAR POWER PLANTS IN SOUTH AFRICA – KOEBERG ⁷ ,	80
3.6	NUCLEAR FUEL CYCLE ^{16,23}	83
3.7	OPERATION OF A TYPICAL NUCLEAR POWER PLANT	87
3.8	KOEBERG'S OPERATING MODEL ²²	97

3.9	RADIATION ⁹⁹	99
3.10	SAFETY OF NUCLEAR POWER PLANTS ⁹⁰	101
4	PROJECT DESCRIPTION	111
4.1	INTRODUCTION AND BACKGROUND	111
4.2	PLANT PARAMETER ENVELOPE ⁴³	118
5	NEED AND DESIRABILITY	150
5.1	INTERNATIONAL PERSPECTIVE	150
5.2	NATIONAL PERSPECTIVE	152
5.3	REGIONAL AND LOCAL PERSPECTIVE	159
5.4	NEEDS AND DESIRABILITY GUIDELINES (GN 792 OF 2012)	171
6	PROJECT ALTERNATIVES	177
6.1	REGULATIONS ON PROJECT ALTERNATIVES ¹	177
6.2	IMPORTANCE OF ALTERNATIVES	178
6.3	TYPES OF ALTERNATIVES	179
6.4	ALTERNATIVES CONSIDERED FOR THE NUCLEAR POWER PLANT	179
7	LEGISLATIVE FRAMEWORK	235
7.1	CONSTITUTIONAL AND ADMINISTRATIVE FRAMEWORK	235
7.2	POLICY AND PLANNING CONTEXT	240
7.3	NATIONAL ENERGY LEGAL FRAMEWORK	258
7.4	NUCLEAR GOVERNANCE	264
7.5	NATIONAL ENVIRONMENTAL LEGAL FRAMEWORK	275
7.6	PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK	308
7.7	INTERNATIONAL ENVIRONMENTAL AND SOCIAL STANDARDS	320
7.8	OTHER GUIDELINES AND BEST PRACTICE RECOMMENDATIONS	334
7.9	CONSISTENCY WITH NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA) PRINCIPLES	335
8	BASELINE ENVIRONMENT	342

8.1	PHYSICAL ENVIRONMENT	342
8.2	BIOLOGICAL ENVIRONEMENT	400
8.3	SOCIAL AND ECONOMIC ENVIRONMENT	454
9	SITE SENSITIVITIES VERIFICATION	496
9.1	CONSOLIDATED SITE SENSITIVITY	502
10	POTENTIAL IMPACTS	505
10.1	IDENTIFICATION OF POTENTIAL IMPACTS	505
10.2	PHASE OF DEVELOPMENT	505
10.3	ACTIVITIES MATRIX	509
10.4	POTENTIAL IMPACTS	522
10.5	CUMULATIVE IMPACT ASSESSMENT	670
10.6	EXISTING DEVELOPMENTS IDENTIFIED IN THE SITE VICINITY	677
10.7	SURROUNDING RENEWABLE ENERGY PROJECTS	678
10.8	SUMMARY OF IMPACT SIGNIFICANCE SCREENING	683
11	PLAN OF STUDY FOR THE EIA	703
11.1	TERMS OF REFERENCE	703
11.2	OVERVIEW OF THE EIA PHASE TASKS	703
11.3	SPECIALIST SCOPING PHASE CONCLUSIONS	703
11.4	PREFERRED ALTERANTIVES FOR INCLUSION IN THE EIA PHASE	728
11.5	ASPECTS TO BE ASSESSED IN THE EIA PROCESS	733
11.6	SPECIALIST STUDIES TO BE UNDERTAKEN	739
11.7	PEER REVIEW TERMS OF REFERENCE	769
11.8	IMPACT ASSESSMENT METHODOLOGY	770
11.9	ENVIRONMENTAL IMPACT ASSESSMENT REPORT	775
11.10	STAKEHOLDER AND AUTHORITY ENGAGEMENT	776
12	CONCLUSION AND WAY FORWARD	778

TABLES

Table 1-1 – Key Technical Details for the proposed NPP	2
Table 1-2 – Property Details	5
Table 1-3 – Thyspunt – Property Boundary Co-ordinates	10
Table 1-4 – Bantamsklip – Property Boundary Co-ordinates	11
Table 1-5 – Details of Project Proponent	13
Table 1-6 – Competent Authority	14
Table 1-7 – Details of the EAP	15
Table 1-8 – Details of the EAP and Legal Peer Reviewers	16
Table 1-9 – Details of Specialists	16
Table 1-10 – Details of Specialists undertaking Peer Reviews	20
Table 1-11 – Legislated Report Requirements as detailed in GNR 982	23
Table 2-1 – Sensitivities identified in the DFFE Screening Reports	29
Table 2-2 – Specialist Studies identified by the DFFE Screening Reports	31
Table 2-3 – Determining the Consequence rating of an impact (the higher of the magnitude/extent, or magnitude/duration scores)	35
Table 2-4 – Criteria for Magnitude, Duration and Extent	36
Table 2-5 – Using Consequence and Likelihood to determine significance ratings	36
Table 2-6 – Thresholds of Concern, impact significance, and the mitigation hierarchy	37
Table 2-7 – Dates on which the Newspaper Advertisements were published	41
Table 2-8 – Radio Broadcasts	41
Table 2-9 – Pre-application Public Information Meetings	43
Table 2-10 – Locations for DSR Public Review	44
Table 2-11 – Scheduled Public Meetings during DSR Public Review Period	45
Table 2-12 - Focus Group Meetings during DSR Public Review Period	45
Table 2-13 – Breakdown of the substantive comments received between December 2025 and March 2026	47
Table 2-14 – I&AP Registration Requests (December 2025 – March 2026)	47
Table 2-15 – Public Participation Process	48
Table 2-16 – Site Selection	48
Table 2-17 – Environmental Concerns	48

Table 2-18 – Technical and Process Concerns	49
Table 2-19 – Financial and Economic Concerns	49
Table 2-20 – Socio-Economic Concerns	50
Table 2-21 – Energy Alternative Concerns	50
Table 2-22 – Nuclear Specific Concerns	50
Table 2-23 – Breakdown of the substantive comments received between April to May 2026	51
Table 2-24 – Breakdown of the substantive comments received between April to May 2026	55
Table 3-1 – Lessons Learned from Major Nuclear Accidents	77
Table 3-2 – Generation III+ Reactors Safety Features ¹²	79
Table 3-3 – Types of Waste Generated from a NPP ⁷ ,	86
Table 3-4 – Radiation Types ^{23,24}	99
Table 3-5 – Ionising Radiation Sources	100
Table 3-6 – Three Major Nuclear Incidents ¹¹	104
Table 4-1 – Ancillary and Support Infrastructure associated with the NPP	115
Table 4-2 – NPP Location, Capacity and Buildable Area	120
Table 4-3 – Reactor Technology Overview	120
Table 4-4 – Reactor Parameters	122
Table 4-5 – Plant Heat Sink Parameters ⁴³	123
Table 4-6 – Circulating Water Treatment Parameters	124
Table 4-7 – Intake Structure Parameters	125
Table 4-8 – Outflow Structure Parameters	125
Table 4-9 – Potable Water/ Waste System Parameters ⁴³	127
Table 4-10 – Demineralised Water System Parameters ⁴³	128
Table 4-11 – Desalination Plant Parameters	128
Table 4-12 – Fire Protection System Parameters ⁴³	129
Table 4-13 – Fuel Parameters ⁴³	130
Table 4-14 – Standby Power System Parameters ⁴³	131
Table 4-15 – Hydrogen Plant Parameters	132
Table 4-16 – Airborne Effluent Release Parameters ⁴³	132

Table 4-17 – Auxiliary Steam Boiler Parameters	134
Table 4-18 – Helicopter Land Pad Parameters	134
Table 4-19 – Plant Characteristics ⁴³	134
Table 4-20 – Construction Parameters ⁴³	135
Table 4-21 – Civil Works Parameters	136
Table 4-22 – Decommissioning Parameters ⁴³	136
Table 4-23 – Liquid Radwaste System Parameters ⁴³	137
Table 4-24 – Solid Radwaste System Parameters ⁴³	138
Table 4-25 - Access Road Network for Thyspunt	145
Table 5-1 – Principles of the Nuclear Energy Policy, 2008	152
Table 5-2 – Projected Installed Electricity Generation Capacity (2039)	156
Table 5-3 – Planning and Development Frameworks	160
Table 5-4 – Part 1 – Need	171
Table 5-5 – Part 2 – Desirability	173
Table 6-1 – Studies Undertaken for NSIP	180
Table 6-2 – Available Baseline Information ¹¹³	182
Table 6-3 – Reasons for excluding Coega IDZ ¹¹²	187
Table 6-4 – Preliminary Comparison between Alternative sites (AD = Advantage, DIS = Disadvantage, NR = Not Relevant) . . .	189
Table 6-5 – Grid connection comparison between Bantamsklip and Thyspunt	193
Table 6-6 – Thyspunt vs Bantamsklip Transmission & System Considerations	196
Table 6-7 – Energy Alternatives	203
Table 6-8 – Screening-Level Comparison of Nuclear and Renewables-Led Portfolios	215
Table 6-9 – Comparison between Power Generation Options	219
Table 6-10 – Project stages and their likely durations (Eskom, 2013, 2024, 2025a)	223
Table 6-11 – Comparison of cooling options	225
Table 6-12 – Once-through intake and discharge flow rates and effluent characteristics (Eskom, 2013, 2025a)	227
Table 7-1 – Applicable Constitutional and Administrative Legal Dispensation	235
Table 7-2 – Applicable Policies and Plans	240
Table 7-3 – NDP Objectives Mapped to IRP 2025 Nuclear Provisions	255

Table 7-4 – Draft NSSD vs NEMA Principles (NPP EIA Context)	256
Table 7-5 – NDP vs NEMA Principles (NPP EIA Context)	257
Table 7-6 – Applicable National Energy Legislation	258
Table 7-7 – Relevant Policy and Guidelines related to Nuclear Governance	264
Table 7-8 – Applicable National Legislation	275
Table 7-9 – Provincial and Municipal Plans	308
Table 7-10 – IFC Performance Standards Applicability to the Project	321
Table 7-11 – Requirements and Applicability of the Equator Principles	330
Table 7-12 – Additional Permits and Authorisations required for the proposed development	334
Table 7-13 – Consistency of the NPP and the EIA Process with the NEMA principles	335
Table 8-1 – Tidal Levels (Bantamsklip)	371
Table 8-2 – Extreme water level increases due to storm surge	372
Table 8-3 – Extreme water level increases due to long waves	372
Table 8-4 – Extreme temperatures at Bantamsklip	373
Table 8-5 – EVA Results Bantamsklip	374
Table 8-6 – Tidal Levels (Thyspunt)	379
Table 8-7 – Extreme water level increases due to storm surge	379
Table 8-8 – Extreme water level increases due to long waves	380
Table 8-9 – EVA of depth-averaged current speeds at Thyspunt	380
Table 8-10 – Extreme temperatures at Thyspunt	381
Table 8-11 – Site annual dose to a member of the public (representative person dose)	385
Table 8-12 – Natural radiation exposure pathways and human dose	386
Table 8-13 – Means and extremes of temperature for Cape St. Francis 2004-2007. Gibb, 2016	395
Table 8-14 – Priority Species at risk of collision. TBC, 2026	448
Table 8-15 – Sensitive receptors close to the Bantamsklip site. WSP, 2026	484
Table 8-16 – Sensitive receptors close to the Thyspunt site. WSP, 2026	486
Table 8-17 – Oyster Bay Groundwater Sources. SRK, 2026	493
Table 9-1 – Assessment Protocols and Site Sensitivity Verifications – Thyspunt	496
Table 9-2 – Assessment Protocols and Site Sensitivity Verifications – Bantamsklip	499

Table 10-1 – Key activities associated with project phases	505
Table 10-2 – Activities Matrix (C – Construction, O – Operation, D – Decommissioning)	509
Table 10-3 – Air Quality Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	522
Table 10-4 – Dune Geomorphology Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	525
Table 10-5 – Geohydrology Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	530
Table 10-6 – Freshwater Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	531
Table 10-7 – Surface Water Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	533
Table 10-8 – Marine Physical, Water Quality, Sediment Transport and Shoreline Change Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	534
Table 10-9 – Geotechnical Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	546
Table 10-10 – Agricultural Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	550
Table 10-11 – Fauna and Invertebrates Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	551
Table 10-12 – Flora Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	574
Table 10-13 – Terrestrial Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	576
Table 10-14 – Aquatic Ecosystems Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	578
Table 10-15 – Marine Ecology Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	584
Table 10-16 – Avifauna Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	601
Table 10-17 – Socio-economic Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	614
Table 10-18 – Heritage Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	649

Table 10-19 – Noise Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	660
Table 10-20 – Town Planning Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	661
Table 10-21 – Visual Impact Significance (P – Planning, C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	662
Table 10-22 – Health Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	664
Table 10-23 – Climate Change Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	666
Table 10-24 – Radiological Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	667
Table 10-25 – Radioactive Waste and Transport Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)	668
Table 10-26 – Approved renewable projects within 50 km of the Bantamsklip site	678
Table 10-27 – Approved renewable projects within 50 km of the Thyspunt site	679
Table 10-28 – Significance of Potential Impacts	683
Table 10-29 – Initial Cumulative Impacts	702
Table 11-1 – Plan of Study Requirements	703
Table 11-2 – Summary of Site Suitability Assessment	707
Table 11-3 – Summary of Preferred Site per Specialist Theme	729
Table 11-4 – Alternatives to be Assessed in the EIA Phase	732
Table 11-5 – Summary of aspects to be addressed in the EIA Phase	733
Table 11-6 – Determining the Consequence rating of an impact (the higher of the magnitude/extent, or magnitude/duration scores)	771
Table 11-7 – Criteria for Magnitude, Duration and Extent	771
Table 11-8 – Using Consequence and Likelihood to determine significance ratings	772
Table 11-9 – Thresholds of Concern, impact significance, and the mitigation hierarchy	772

FIGURES

Figure 1-1 – Bantamsklip Locality Map	4
Figure 1-2 – Thyspunt Locality Map	5

Figure 1-3 – Bantamsklip Property Map	9
Figure 1-4 – Thyspunt Property Map	9
Figure 1-5 - Relationship between the NNR NISL and EIA Processes (Red stars denote the current status of each process)	13
Figure 2-1 – S&EIR Process for the Proposed NPP	28
Figure 2-2 – Determining the significance of impacts in the absence of ToC and LAC	35
Figure 2-3 – Mitigation Sequence/Hierarchy	39
Figure 2-4 – Site note placement near Bantamsklip	42
Figure 2-5 – Site notice placement near Thyspunt	43
Figure 3-1 – Koeberg Site Map	82
Figure 3-2 – Nuclear Fuel Cycle	83
Figure 3-3 – Operating Model at Koeberg	98
Figure 3-4 – Types of Radiation (NNR, 2022)	100
Figure 3-5 – Average Public Exposure by Radiation Sources ²⁷	101
Figure 3-6 – Deaths per Energy Source ³¹	106
Figure 3-7 – Koeberg's Exclusion Protection Zones ⁹⁰	107
Figure 4-1 – PPE Development Approach	119
Figure 4-2 – Vaalputs Nuclear Waste Storage Facility	139
Figure 4-3 – Storage of Waste at Vaalputs Nuclear Waste Storage Facility	139
Figure 4-4 – Location of Vaalputs in relation to proposed NPP sites	140
Figure 4-5 – Weather Station at Thyspunt	141
Figure 4-6 – Access Roads leading to Bantamsklip	143
Figure 4-7 – Access Roads leading to Thyspunt	144
Figure 4-8 – Access Road Network for Thyspunt	144
Figure 4-9 – Transmission Integration at Thyspunt	147
Figure 4-10 – Transmission Integration at Bantamsklip	148
Figure 4-11 – Proposed Transmission Corridors within South Africa	149
Figure 5-1 – Current Installed Electricity Generation Capacity	155
Figure 5-2 – Proposed New Electricity Generation Capacity by 2039	156
Figure 5-3 – Load-shedding hours over the years in South Africa	158
Figure 6-1 – NSIP Earmarked Sites	181

Figure 6-2 – Power Corridors ¹¹³	183
Figure 6-3 – El da Baba NPP Roadmap and Status ¹¹⁵	186
Figure 6-4 – Rappoor NPP History ¹¹⁵	186
Figure 6-5 – Transmission Integration at Thyspunt	192
Figure 6-6 – Transmission Integration at Bantamsklip	193
Figure 6-7 – Proposed Transmission Corridors within South Africa	195
Figure 6-8 – Existing Road Links (Bantamsklip)	198
Figure 6-9 – Possible Site Access at Bantamsklip	199
Figure 6-10 – Existing Road Links Route Alternatives (Thyspunt)	200
Figure 6-11 – Alternative Access Roads (Thyspunt)	201
Figure 6-12 – Additional Alternative Access Roads (Thyspunt)	202
Figure 6-13 – Preliminary Site footprint for Thyspunt	220
Figure 6-14 – Preliminary Site footprint for Bantamsklip	221
Figure 6-15 – Once-Through Cooling Process Flow (As integrated with other intake/discharge requirements)	223
Figure 6-16 – Evaporative Cooling Process Flow	224
Figure 6-17 – Indicative range of intake and discharge infrastructure options available for the selected sites (presented here for the Bantamsklip site) Source: Eskom (2013)	228
Figure 8-1 – Geologic Map of Onshore and Offshore Site Vicinity and Site Area. Eskom SSV Geology 2014	342
Figure 8-2 – Geological Map of the Onshore Site Region. SSR, 2014	343
Figure 8-3 – Geology of the Thyspunt Site Vicinity (Goedhart et al, 2008 as cited by Eskom Geology SSR, 2015)	345
Figure 8-4 – Typical site conditions on the Bantamsklip site. Soil ZA, 2026	346
Figure 8-5 – Agricultural sensitivity – DFFE Screening Tool, 2026	347
Figure 8-6 – Typical site conditions on the Thyspunt inland site. Soil ZA, 2026	348
Figure 8-7 – Thyspunt Land-Use Map. Gibb, 2016	349
Figure 8-8 – Agricultural sensitivity – DFFE Screening Tool, 2026	350
Figure 8-9 – Probabilistic Seismic Hazard Map of South Africa. WSP, 2026	351
Figure 8-10 – Seismic zones of South Africa. WSP, 2026	351
Figure 8-11 – Geological Map of the Bantamsklip area. WSP, 2026	353
Figure 8-12 – Geological Map of the Thyspunt Area. WSP, 2026	354

Figure 8-13 – Artificially vegetated transverse dunes at Bantamsklip	355
Figure 8-14 – Steep ridges formed by arms of parabolic dunes. Illenberg & Associates, 2026.	355
Figure 8-15 – Illustration of the original St. Francis headland bypass dune field system. Illenberger & Burkinshaw (2008) as cited by Gibb, 2016	356
Figure 8-16 – Slopes of the interdune surfaces in the Oyster Bay dunefield. Illenberg & Associates, 2026	357
Figure 8-17 – Penny Sands River. Illenberg & Associates, 2026	357
Figure 8-18 – Surface flow in the Oyster Bay dunefield. Illenberg & Associates, 2026	358
Figure 8-19 – Regional Water features - Bantamsklip. SRK, 2026	360
Figure 8-20 – Sub catchment Boundaries. SRK, 2026	361
Figure 8-21 – Major watercourses in proximity to the Thyspunt site. SRK, 2026	362
Figure 8-22 – Simplified Geohydrology Map surrounding the Bantamsklip site. SRK, 2026	365
Figure 8-23 - Bantamsklip Borehole Locality Map. SRK, 2026	367
Figure 8-24 – Boreholes associated with the Thyspunt site. SRK, 2026	369
Figure 8-25 – Bantamsklip coastal context	370
Figure 8-26 – Bantamsklip Bathymetry (<i>Legend: Lighter grey lines normal to the coastline indicate beach profile sections</i>)	370
Figure 8-27 – Location of Instruments Deployed at Bantamsklip	371
Figure 8-28 – Wave measurements at Bantamsklip Site A and B (PRDW, 2009b)	374
Figure 8-29 – Measured beach profile locations at Bantamsklip	375
Figure 8-30 – Modelled storm erosion profiles at Bantamsklip	376
Figure 8-31 – Thyspunt coastal context	377
Figure 8-32 – Thyspunt multibeam bathymetry and beach profile sections (<i>Legend: Light grey lines indicate beach profile sections</i>)	378
Figure 8-33 – Location of Instruments Deployed at Thyspunt (Eskom, 2025)	379
Figure 8-34 – Erosion lines for 2034 climate change scenario	383
Figure 8-35 – Erosion lines for the 2114 climate change scenario	384
Figure 8-36 – Erosion lines for the 2134 climate change scenario	384
Figure 8-37 – Illustration of components of average human dose from different exposure pathways	386
Figure 8-38 – Properties associated with the Bantamsklip site. WSP, 2026	388

Figure 8-39 – Properties associated with the Thyspunt site	389
Figure 8-40 – Monthly Rainfall Data at Stanford WS and Bantamsklip WS. Airshed, 2026	392
Figure 8-41 – Wind roses for Cape St. Francis and Thyspunt. Gibb, 2016	394
Figure 8-42 – Comparison of SAWS Cape St. Francis WS and Thyspunt WS for 2017-2019 data period. Airshed, 2026	394
Figure 8-43 – Monthly Rainfall Data at Cape St. Francis WS, Humansdorp WS and Thyspunt WS. Airshed, 2026	396
Figure 8-44 – Regional Vegetation types occurring on and around the Bantamsklip Site. BioCensus, 2026	401
Figure 8-45 – Fine-scale Habitats occurring on and around the Bantamsklip site. BioCensus, 2026	402
Figure 8-46 – Regional Vegetation types occurring on and around the Thyspunt Site. BioCensus, 2026	403
Figure 8-47 – Fine-scale Habitats occurring on and around the Thyspunt site. BioCensus, 2026	404
Figure 8-48 – SCC Locations within the Thyspunt POAI. BioCensus, 2026	405
Figure 8-49 – WCBSP of the Bantamsklip site	407
Figure 8-50 – National Landcover Map of Bantamsklip	408
Figure 8-51 – National Protected Area Expansion Strategy of Bantamsklip site	409
Figure 8-52 – Regional vegetation types occurring on and around the Bantamsklip site	410
Figure 8-53 – National Threatened Ecosystems of Bantamsklip site	410
Figure 8-54 – KBAs of Bantamsklip site	411
Figure 8-55 – ECBSP of the Thyspunt site	414
Figure 8-56 – National Land Cover dataset of Thyspunt region	415
Figure 8-57 – Protected areas of Thyspunt site	416
Figure 8-58 – Regional vegetation types occurring on and around the Thyspunt site	417
Figure 8-59 – Key Biodiversity Areas of the Thyspunt site	418
Figure 8-60 – Wetlands that were delineated at Thyspunt in 2013 as cited by Gibb, 2016	423
Figure 8-61 – Map of the habitats delineated for the Bantamsklip PAOI. TBC, 2026	425
Figure 8-62 – The Roadside habitat observed at the Bantamsklip Site. TBC, 2025	426
Figure 8-63 – Degraded fynbos habitat preset on the Bantamsklip site. TBC, 2026	426
Figure 8-64 – Coastal fynbos habitat observed at the Bantamsklip POAI. TBC, 2026	427

Figure 8-65 – Photos of the disturbed fynbos habitat at Bantamsklip. TBC, 2026	428
Figure 8-66 – An example of modified habitat. TBC, 2026	428
Figure 8-67 – Fynbos habitat at the Bantamsklip site. TBC, 2026	429
Figure 8-68 – Bantamsklip Habitat SEI. TBC, 2026	430
Figure 8-69 – The Micro Frog <i>Microbatrachella Capensis</i> (Source: https://natureconnect.earth/)	431
Figure 8-70 – Thyspunt habitat delineation. TBC, 2026	433
Figure 8-71 – Disturbed Grassy Fynbos within Thyspunts POAI. TBC, 2026	434
Figure 8-72 – Pasture field habitat within the Thyspunt POAI. TBC, 2026	434
Figure 8-73 – Seashore Vegetation habitat at Thyspunt. TBC, 2026	435
Figure 8-74 – Standveld Habitat within the Thyspunt POAI. TBC, 2026	435
Figure 8-75 – Water Resource habitat observed in the Thyspunt POAI. TBC, 2026	436
Figure 8-76 – Cape Sand Frog. TBC, 2026	437
Figure 8-77 – Elandsberg dwarf chameleon found at Langefonteinvelei wetland in 2009. Gibb, 2016	438
Figure 8-78 – The Cape Grindle Lizard. TCB, 2026	438
Figure 8-79 – Mammals observed at Thyspunt in 2025. TBC, 2026	439
Figure 8-80 – SCC potentially present at Bantamsklip (Source: https://www.inaturalist.org/)	440
Figure 8-81 – <i>Vaginalis</i> species found on site. TBC, 2026	441
Figure 8-82 – <i>Mantophasmatodea</i> found in TBC 2025 study. TBC, 2026	441
Figure 8-83 – The location of the SCC found at Thyspunt in 2026. TBC, 2026	442
Figure 8-84 – <i>Diplomorium longipenne</i> specimen collected at Thyspunt in 2008. The Biodiversity Company, 2026	443
Figure 8-85 – Thyspunt invertebrate Sensitivity Map. Gibb, 2016	445
Figure 8-86 – Site Ecological Importance for the PAOI. TBC, 2026	447
Figure 8-87 – Key Avifauna locations. Gibb, 2016	449
Figure 8-88 – Site Ecological Importance – Thyspunt. TBC, 2026	450
Figure 8-89 – The Western Cape Province. WSP, 2026	455
Figure 8-90 – Thyspunt in relation to Eastern Cape Province. WSP, 2026	459
Figure 8-91 – Kouga Local Municipality. WSP, 2026	461
Figure 8-92 – Consolidated Spatial Concept from the Kouga SDF (2021)	463

Figure 8-93 – View towards the site the edge of Pearly Beach. BCK,2026	466
Figure 8-94 – View east towards Buffeljachtbaai.BCK,2026	466
Figure 8-95 – View towards the site from the Conservation Office. BCK,2026	468
Figure 8-96 – Typical low vegetation within the site.CK,2026	469
Figure 8-97 – Households located east of the proposed Thyspunt site. Gibb, 2016	470
Figure 8-98 – DFFE Screening report - Bantamsklip - Archaeological sensitivity	472
Figure 8-99 – Previous Heritage Impact Assessments surrounding the proposed development area. CTS, 2026	473
Figure 8-100 – Heritage Resources were previously identified in and near the study area. CTS, 2026	474
Figure 8-101 – DFFE Screening Report -Bantamsklip Palao Sensitivity	476
Figure 8-102 – Palaeosensitivity Map. Indicating Very High fossil sensitivity underlying the study area. CTS, 2026	477
Figure 8-103 – DFFE Screening Tool - Thyspunt - Archaeological and Cultural Sensitivity	479
Figure 8-104 – Heritage Resources previously identified in and near the study area. CTS, 2026	480
Figure 8-105 – DFFE Screening Report -Thyspunt Palao Sensitivity	482
Figure 8-106 – Palaeosensitivity Map – Thyspunt. CTS, 2026	483
Figure 8-107 – Location of nearest sensitive receptors surrounding the Bantamsklip site. WSP, 2026	485
Figure 8-108 – Location of nearest sensitive receptors surrounding the Thyspunt site. WSP, 2026	487
Figure 8-109 – Existing Road Links, ITS, 2023	488
Figure 8-110 – Possible Site Access – Bantamsklip. ITS, 2026	489
Figure 8-111 – Surrounding Routes -Thyspunt. ICS, 2026	490
Figure 8-112 – Bantamsklip Borehole Locality Map. SRK, 2026	492
Figure 8-113 – Water Supply Map – Thyspunt. SRK, 2026	494
Figure 9-1 – Consolidated Sensitivity Map overlain by the Preliminary Site Layout for Thyspunt	503
Figure 9-2 – Consolidated Sensitivity Map overlain by the Preliminary Site Layout for Bantamsklip	504

Figure 10-1 – Existing surrounding projects within 50 km of the Bantamsklip site (REEA, Q3 2025)	679
Figure 10-2 – Existing surrounding projects within 50 km of the Thyspunt site (REEA, Q3 2025)	682
Figure 11-1 – Determining the significance of impacts in the absence of ToC and LAC	771
Figure 11-2 – Mitigation Sequence/Hierarchy	775

APPENDICES

APPENDIX A

DFFE AND NNR CO-OPERATIVE AGREEMENT

APPENDIX B

PUBLIC PARTICIPATION REPORT

APPENDIX C

EAP CV AND DECLARATION

APPENDIX C.1

EAP CV & QUALIFICATIONS

APPENDIX C.2

EAP DECLARATION & UNDERTAKING

APPENDIX D

EAP AND LEGAL PEER REVIEWER CVS

APPENDIX E

SPECIALIST CVS & DECLARATIONS

APPENDIX E.1

SPECIALIST DECLARATIONS

APPENDIX E.2

SPECIALIST QUALIFICATIONS

APPENDIX F

PEER REVIEWER DECLARATIONS & QUALIFICATIONS

APPENDIX G

SPECIALIST STUDIES

APPENDIX G.1

DUNE GEOMORPHOLOGY



APPENDIX G.2

GEOTECHNICAL

APPENDIX G.3

HYDROLOGY

APPENDIX G.4

GEOHYDROLOGY

APPENDIX G.5

FRESHWATER SUPPLY

APPENDIX G.6

AIR QUALITY

APPENDIX G.7

AQUATIC BIODIVERSITY

APPENDIX G.8

TERRESTRIAL FAUNA (VERTEBRATES AND INVERTEBRATES)

APPENDIX G.9

TERRESTRIAL BIODIVERSITY

APPENDIX G.10

TERRESTRIAL FLORA

APPENDIX G.11

AVIFAUNA

APPENDIX G.12

MARINE BIOLOGY

APPENDIX G.13

MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE

APPENDIX G.14

SOCIO-ECONOMIC

APPENDIX G.15

VISUAL

APPENDIX G.16

HERITAGE

APPENDIX G.17

AGRICULTURAL POTENTIAL

APPENDIX G.18



NOISE

APPENDIX G.19

HUMAN HEALTH RISK

APPENDIX G.20

TRAFFIC AND TRANSPORTATION

APPENDIX G.21

RADIOLOGICAL IMPACT

APPENDIX G.22

RADIOACTIVE WASTE MANAGEMENT AND TRANSPORT

APPENDIX G.23

CLIMATE CHANGE

APPENDIX G.24

SPATIAL PLANNING

APPENDIX H

DFFE SCREENING TOOL REPORT

APPENDIX I

SITE SENSITIVITY VERIFICATION REPORT

APPENDIX J

PRE-APPLICATION MEETING MINUTES

APPENDIX K

COMPREHENSIVE PLANT PARAMETER ENVELOPE

APPENDIX L

PROOF OF SIP APPLICATION

APPENDIX M

DEA LETTER NUCLEAR SAFETY IN EIA PROCESSES

APPENDIX N

MAPS

APPENDIX O

STAKEHOLDER INPUT FOR UPDATED TERMS OF REFERENCES

1 INTRODUCTION

WSP Group Africa (Pty) Ltd (WSP) has been appointed by Eskom Holdings SOC Ltd (Eskom) to undertake an Environmental and Social Impact Assessment (ESIA) to meet the requirements under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), also in line with international standards, for the proposed Nuclear Power Plant (NPP) project located either at Bantamsklip in the Overstrand Local Municipality of the Western Cape province or at Thyspunt in the Kouga Local Municipality of the Eastern Cape province.

The proposed development is subject to a Scoping and Environmental Impact Reporting (S&EIR) process in terms of NEMA (as amended) and Appendix 2 and 3 of the EIA Regulations, 2014 and Government Notice Regulation (GNR) 983 (as amended), GNR 984 (as amended) and GNR 985 (as amended). The competent authority for this S&EIR process is the National Department of Forestry, Fisheries and the Environment (DFFE).

1.1 PURPOSE OF THIS REPORT

The S&EIR process is an interdisciplinary procedure to ensure that environmental and social considerations are included in decisions regarding projects. Simply defined, the process aims to identify the possible environmental and social effects of a proposed activity and how those impacts can be mitigated.

The Final Scoping Report (ESR) (this report) aims to provide stakeholders with information on the proposed development including location, layout and technological alternatives, the scope of the environmental assessment and key impacts to be addressed in the environmental assessment, and the consultation process undertaken through the S&EIR process.

1.2 BACKGROUND INFORMATION

South Africa's Nuclear Energy Policy (2008), guided by the 1998 White Paper on Energy Policy, establishes nuclear power as part of a diversified energy mix to reduce reliance on coal, ensure supply security, and mitigate climate change through low-carbon generation. It sets objectives for new NPPs, radioactive waste management, safety oversight, and regulatory effectiveness, while aligning with the National Development Plan (2030), which calls for a secure, sustainable energy portfolio and careful evaluation of role of nuclear. The Integrated Resource Plan (2025) positions nuclear alongside renewables and green hydrogen in a Just Energy Transition (JET), targeting 5 200 MW of new nuclear capacity by 2039, with potential expansion to 10 000 MW under a proposed Nuclear Industrialisation Plan.

South Africa's operational experience with Koeberg Nuclear Power Station demonstrates safe, secure nuclear generation, currently contributing ~5% of national electricity and providing stable baseload capacity to address chronic supply shortfalls. Eskom, responsible for 85 to 90 % of the national power, is committed to diversification and reliability, with authorisation already granted (11 October 2017) by the DFFE for the Nuclear 1 project at Duynefontyn that has been authorised for the generation of up to 4 000 MW. An appeal process ran until 29 July 2025, which culminated in the DFFE confirming the decision to grant authorisation (it is noted that a court review may still be possible).

Eskom now proposes a NPP with the generation capacity of up to 5 200 MW at either Bantamsklip (170 ha) in the Western Cape or Thyspunt (250 ha) in the Eastern Cape, with WSP appointed as the independent Environmental Assessment Practitioner (EAP) to conduct the S&EIR process, aligned with international standards and supported by an Environmental and Social Management Plan (ESMP).

The development footprint includes the NPP itself, and all associated infrastructure as indicated in Table 1-1.

Table 1-1 – Key Technical Details for the proposed NPP

Aspect	Detail	
Technology	Nuclear	
Total Buildable Area (i.e. likely footprint area)	Thyspunt 250 ha	Bantamsklip 170 ha
Export Capacity	Up to 5200 MW (subject to finalisation based on generation capacity scenario selection)	
Design Life	60 years with possibility to extend to 80 years	
Reactor	The proposed development will include multiple units of large conventional Pressurised Water Reactors (PWR) or Small Modular Reactors (SMR) of either PWR or High Temperature Gas Reactors (HTGR) or a mixture thereof (i.e. both conventional and Small modular reactors on the same site). To this end the S&EIR Process will be technology neutral and use a Plant Parameter Envelope approach, meaning it will use parameters from multiple reactor technologies and provide an assessment of the likely effects of a new nuclear project by forming a bounding case. This approach provides flexibility for Eskom regarding future new nuclear deployment.	
Plant Heat Sink	- Sea water cooling using up to around 200 m³/s. - The maximum increase in the temperature of the recirculated water should be < 1.5°C	
Circulating Water Treatment System	Total residual oxidant - 0.5 mg/l	
Intake Structure	- Distance off shore (m): 1 000 to 2 000 - Number of Tunnels (for power station): 2 - 3 - Diameter of tunnels (m): 5 to 10 - Depth of Tunnels (m): ± 30	
Outfall Structure	- Number of tunnels: 3 to 4 - Diameter of tunnels (m): Approximately 3 - Distance off shore (m): Approximately 500 - Depth of Tunnels (m): Approximately 5	
Potable Water System	Maximum Use: 140 l/s / 104.72 l/s (for air-cooled reactors) Stored Water Volume: - Site water (SEP): 48740 m³ - Feed water (SER): 8073 m³ - Demineralised (SED): 1 346 m³ - Condensate feed water (ASG): 4306 m³ - Demineralised primary make-up water (REA): 45747 m³ - Borated Refuelling Water (PTR): 8611 m³	

Aspect	Detail	
Demineralised Water System	- Maximum use / withdrawal from water source: 49.96/s (4 units) - Capacity of demineralised water storage: 4 x 2 200 m³ + 2 x 800 m³ 45747 m³ {2 Demineralised primary make-up water tanks (REA) [8 500 m³] 17 595 m³}	
Fire Protection System	- Maximum Use of Raw Water: 104.2 l/s - Dependent upon chosen reactor technology - Stored Water Volume: 15254.2 m³	
Used Fuel	- Total Mass of used fuel during Licensed Operation: ~5925 T (60 years) per unit - Spent Fuel Storage Pool: capacity of 10 years + full core offload (nominal), with a volume of 3380m³ (total volume below normal water level assemblies or racks) - Spent Fuel Dry Storage: 12.14 ha with a storage capacity of 80 years	
Standby Power System	- Diesel: capacity of 4 x 20 MW, with a storage tank capacity of 6 900 m³ - Station Black-out Diesels: capacity of 2 x 5 MW with storage tank capacity of 1300 m³ - Gas-Turbines: with a capacity of 77 MW	
Hydrogen Plant	- H2 Plant / Unit: 15x2 Nm³/h @ 25 4 x Storage Tanks: 30 Nm³	
Auxiliary Steam Boiler	- Auxiliary Steam Boiler: x8 32 t/h - Diesel Storage Tanks: 676 m³	
Access Routes	- Heavy Haul Routes: 4.00 ha - Maximum Shipment Weight: 1 100 t	
Office Facilities	11 ha	
Parking Lots	2.5 ha	
Permanent Support Facilities	11 ha	
Power Block	20.6 ha	
Protected Areas (maximum)	40 ha	
Switchyard (maximum)	9.7 ha	
Laydown Areas and temporary Construction Facilities	- Laydown Areas: 23.5 ha (for laydown only) - Temporary Construction Facilities: 24.3 ha (concrete batch plant) - Construction Parking Lot: 16.2 ha (Construction parking with separate construction site access road)	
Civil Works - Spoil	Bantamsklip	Thyspunt
	- Natural Ground to Topsoil (0,3m deep): 197 850 m³ - Sand Stockpile: 11 965 574 m³ - Backfill: 1 892 301 m³ - Sand to Spoil: 10 073 273 m³ - Rock Stockpile: 198 591 m³	- Natural Ground to Topsoil (0,3m deep): 229 456 m³ - Sand Stockpile: 7 890 419 m³ - Backfill: 1 518 375 m³ - Sand to Spoil: 6 372 044 m³ - Rock Stockpile: 708 356 m³
Plant Population	- Construction: 6500 vendor construction workers; 2 860 vendor staff; 300 Eskom Project Staff; 52 Eskom Consultants; 700 (off-site – 300 substation, 400 transmission) - Operation: 2400 persons (on-site) - Refuelling/Major Maintenance: 1 000 persons	

1.3 PROJECT LOCATION

The proposed NPP will be located either at Bantamsklip in the Overstrand Local Municipality within the Overberg District Municipality of the Western Cape Province, or at Thyspunt in the Kouga Local Municipality within the Sarah Baartman District Municipality (previously known as Cacadu District Municipality) of the Eastern Cape Province. The Bantamsklip site is situated on the Southern Cape coast, mid-way between Danger and Quoin Points and the Thyspunt site is situated on the Eastern Cape coast between Oyster Bay and St. Francis Bay. **Figure 1-1** below shows the locality map of the proposed NPP site at Bantamsklip, and **Figure 1-2** shows the map of the proposed NPP site at Thyspunt.



Figure 1-1 – Bantamsklip Locality Map

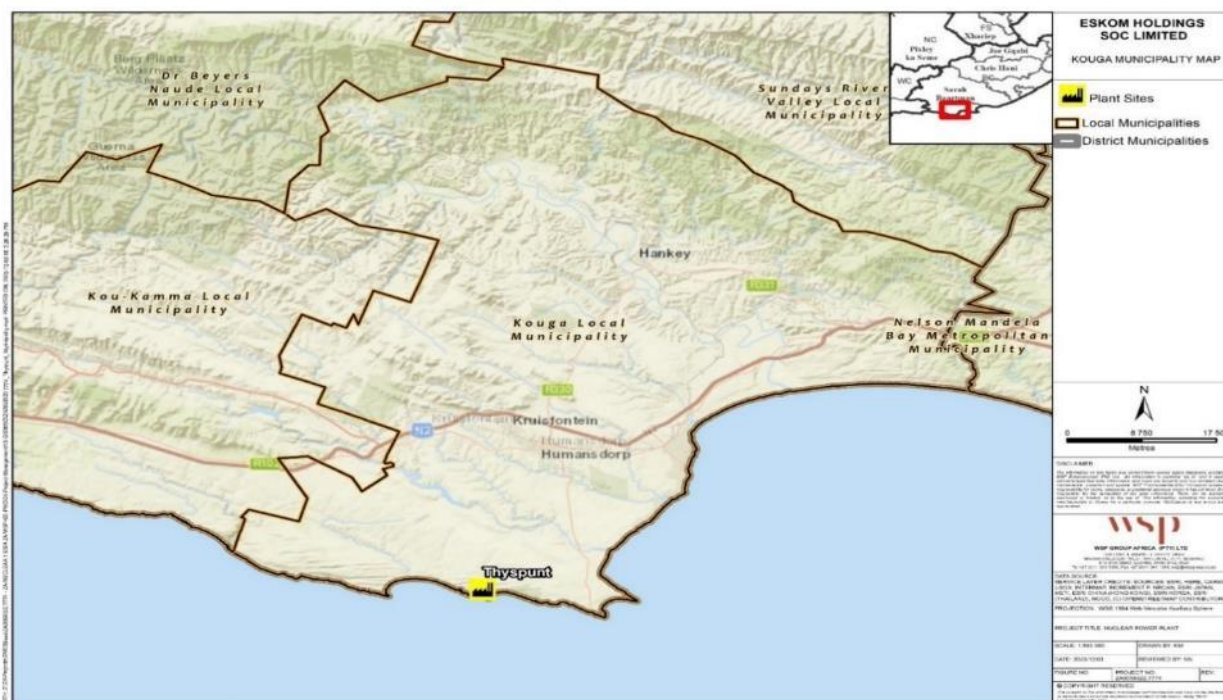


Figure 1-2 – Thyspunt Locality Map

The affected farm portions for each site are outlined in Table 1-2, Figure 1-3 and Figure 1-4. The Thyspunt and Bantamsklip boundary co-ordinates are included in Table 1-3 and Table 1-4.

Table 1-2 – Property Details

Farm name	Portion number	SGID
Thyspunt		
Farm 7454	0	C 0 3 4 0 0 0 0 0 0 0 0 0 0 0 7 4 5 4 0 2 3 8
Farm Langefontein 736	1	C 0 3 4 0 0 0 0 0 0 0 0 0 0 0 7 3 6 0 0 0 0 1
Farm Langefontein 736	2	C 0 3 4 0 0 0 0 0 0 0 0 0 0 0 7 3 6 0 0 0 0 2
Farm Langefontein 736	3	C 0 3 4 0 0 0 0 0 0 0 0 0 0 0 7 3 6 0 0 0 0 3
Farm Langefontein 736	4	C 0 3 4 0 0 0 0 0 0 0 0 0 0 0 7 3 6 0 0 0 0 4
Farm Langefontein 736	5	C 0 3 4 0 0 0 0 0 0 0 0 0 0 0 7 3 6 0 0 0 0 5

Farm name	Portion number	SGID																			
Farm Langefontein 736	6	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	6	0	0	0	6
Farm Langefontein 736	7	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	6	0	0	0	7
Farm Langefontein 736	8	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	6	0	0	0	8
Farm Langefontein 736	172	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	6	0	0	1	2
Farm Welgelegen 735	2	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	5	0	0	0	2
Farm Welgelegen 735	9	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	5	0	0	0	9
Farm Welgelegen 735	10	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	5	0	0	1	0
Farm Welgelegen 735	14	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	5	0	0	1	4
Farm Welgelegen 735	16	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	5	0	0	1	6
Farm Welgelegen 735	17	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	5	0	0	1	7
Farm Welgelegen 735	18	C	0	3	4	0	0	0	0	0	0	0	0	0	7	3	5	0	0	1	8
Farm Welgelegen 743	0	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	3	0	0	0	0
Farm Welgelegen 743	4	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	3	0	0	0	4
Farm Welgelegen 743	6	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	3	0	0	0	6

Farm name	Portion number	SGID																				
Farm Welgelegen 743	8	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	3	0	0	0	0	8
Farm 741	0	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	1	0	0	0	0	0
Farm Buffelsbosch 742	0	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	0	0
Farm Buffelsbosch 742	6	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	0	6
Farm Buffelsbosch 742	9	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	0	9
Farm Buffelsbosch 742	12	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	1	2
Farm Buffelsbosch 742	14	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	1	4
Farm Buffelsbosch 742	16	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	1	6
Farm Buffelsbosch 742	17	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	1	7
Farm Buffelsbosch 742	18	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	1	8
Farm Buffelsbosch 742	19	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	1	9
Farm Buffelsbosch 742	20	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	2	0
Farm Buffelsbosch 742	21	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	2	1
Farm Buffelsbosch 742	22	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	2	0	0	0	2	2
Farm 746	0	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	6	0	0	0	0	0

Farm name	Portion number	SGID																			
Farm 746	5	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	6	0	0	0	5
Farm 746	11	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	6	0	0	0	1
Farm 746	14	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	6	0	0	0	4
Farm 746	23	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	6	0	0	0	3
Farm 746	24	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	6	0	0	0	4
Farm 746	87	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	6	0	0	0	7
Farm 746	92	C	0	3	4	0	0	0	0	0	0	0	0	0	7	4	6	0	0	0	2
Farm 809	0	C	0	3	4	0	0	0	0	0	0	0	0	0	8	0	9	0	0	0	0
Farm 809	36	C	0	3	4	0	0	0	0	0	0	0	0	0	8	0	9	0	0	0	6
Farm 824	0	C	0	3	4	0	0	0	0	0	0	0	0	0	8	2	4	0	0	0	0
Farm 825	0	C	0	3	4	0	0	0	0	0	0	0	0	0	8	2	5	0	0	0	0
Farm 826	1	C	0	3	4	0	0	0	0	0	0	0	0	0	8	2	6	0	0	0	1
Bantamsklip																					
Farm Hagelkraal 318	0	C	0	1	1	0	0	0	0	0	0	0	0	0	3	1	8	0	0	0	0
Farm Hagelkraal 318	1	C	0	1	1	0	0	0	0	0	0	0	0	0	3	1	8	0	0	0	1
Farm Buffel Jagt 309	2	C	0	1	1	0	0	0	0	0	0	0	0	0	3	0	9	0	0	0	2
Farm Buffel Jagt 309	3	C	0	1	1	0	0	0	0	0	0	0	0	0	3	0	9	0	0	0	3
Farm Buffel Jagt Sands 311	0	C	0	1	1	0	0	0	0	0	0	0	0	0	3	1	1	0	0	0	0
Farm Luipaards Poort 310	0	C	0	1	1	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0
Farm 338	0	C	0	1	1	0	0	0	0	0	0	0	0	0	3	3	8	0	0	0	0



Figure 1-3 – Bantamsklip Property Map



Figure 1-4 – Thyspunt Property Map

Table 1-3 – Thyspunt – Property Boundary Co-ordinates

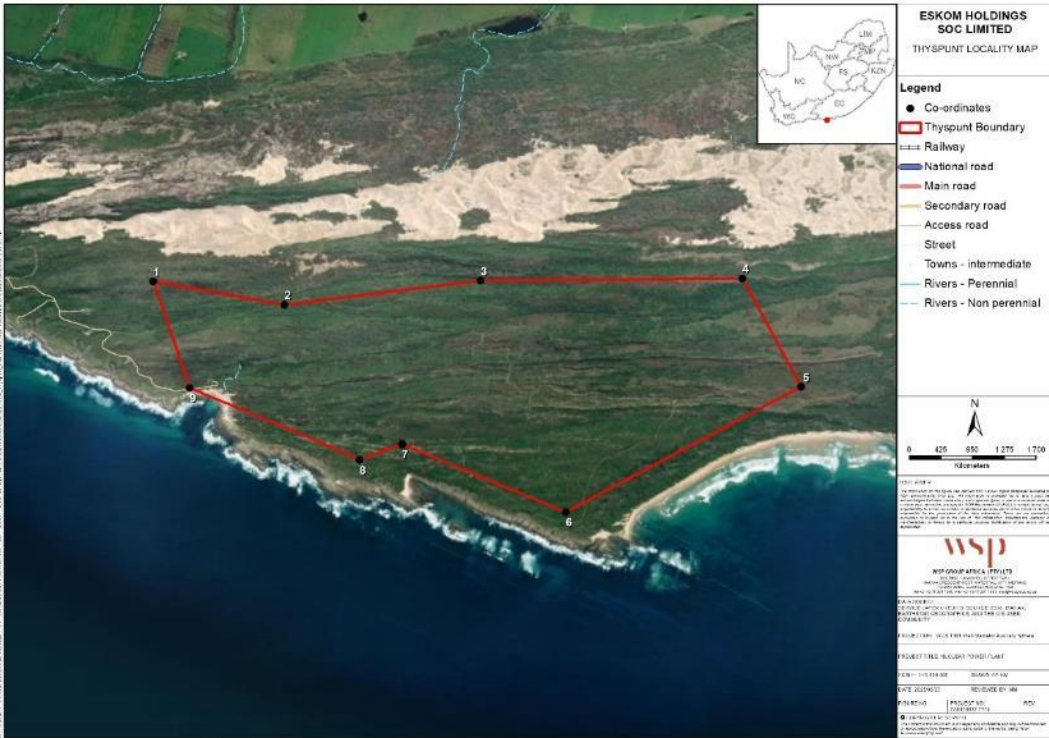
POINT	LATITUDE	LONGITUDE
		
1	34° 10' 35.781" S	24° 40' 50.635" E
2	34° 10' 40.869" S	24° 41' 25.446" E
3	34° 10' 35.601" S	24° 42' 17.485" E
4	34° 10' 35.087" S	24° 43' 26.870" E
5	34° 10' 58.858" S	24° 43' 42.417" E
6	34° 11' 26.355" S	24° 42' 40.099" E
7	34° 11' 11.450" S	24° 41' 56.669" E
8	34° 11' 14.920" S	24° 41' 45.362" E
9	34° 10' 59.115" S	24° 41' 0.262" E

Table 1-4 – Bantamsklip – Property Boundary Co-ordinates

POINT	LATITUDE	LONGITUDE
		
1	34° 41' 28.353" S	19° 33' 50.617" E
2	34° 42' 34.643" S	19° 35' 14.409" E
3	34° 42' 52.025" S	19° 34' 58.402" E
4	34° 43' 0.310" S	19° 35' 7.492" E
5	34° 43' 21.151" S	19° 34' 49.995" E
6	34° 42' 22.186" S	19° 33' 14.297" E
7	34° 42' 8.323" S	19° 33' 13.661" E

1.4 NUCLEAR INSTALLATION LICENCE PROCESS

In addition to the environmental authorisation required under NEMA, the proposed NPP must secure another key authorisation from the National Nuclear Regulator (NNR) prior to construction. Furthermore, various other authorisations are mandated from departments such as the Department of Mineral and Petroleum Resources (DMPR), the Department of Water Affairs and Sanitation (DWS), provincial environmental authorities, the South African Heritage Resources Agency (SAHRA), and additional regulatory bodies like the National Energy Regulator of South Africa (NERSA). The processes associated with these legal requirements are detailed in Section 7 of this report.

The National Nuclear Regulator Act, 1999 (Act No. 47 of 1999) (NNRA) as amended (Act No. 26 of 2024) aims to protect individuals, property, and the environment from nuclear damage, granting the NNR authority over safety and security-related regulatory control. As stipulated in Section 20 of the NNRA, no individual may site, construct, operate, decontaminate, or decommission a nuclear facility without a nuclear licence. Section 21 provides that an application for such a licence must be made to the Chief Executive Officer of the NNR. According to the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) (“the Constitution”) and NEMA, the DFFE, remains responsible for evaluating the potential environmental impacts of the power station, including those related to radiological hazards.

To acknowledge the dual but distinct responsibilities regarding radiation assessment, a co-operative agreement (**Appendix A**) between the DEA (now the DFFE and NNR was gazetted on 18 July 2008). The primary objective of this agreement is to “_prevent unnecessary and avoidable duplication of effort_” between the NNR and DFFE. The NNR's authorisation process is specifically concerned with issues of nuclear and radiation safety pertaining to the siting, design, construction, operation, and decommissioning of nuclear installations. Additionally, a statement issued by the Director General of the DEA in January 2009 (**Appendix M**) further clarifies the purpose of the agreement, indicating that nuclear safety, radiation, and radiology “*are better placed within the regulatory process of the NNRA and that consideration of the same issues in an EIA process will result in unnecessary and avoidable duplication*”.

In alignment with this agreement, the approach adopted in the S&EIR process includes the annexure of “Site Safety Reports¹²” prepared for nuclear licensing purposes, while refraining from an in-depth assessment of radiological issues within the S&EIR itself. However, recognising the requirements of NEMA, supplementary legislation such as the Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000), and relevant legal precedents that necessitate the consideration of all socio-economic factors in the S&EIR process, an evaluation of radiological impacts will nonetheless be incorporated into the reporting. Although this inclusion poses a risk of duplication between the S&EIR and NNR licensing processes, it is considered preferable given the greater risk of appeals arising from the exclusion of substantive issues—such as health considerations—from the S&EIR process.

It is important to note the considerable difference in the approaches of the S&EIR and NNR licensing processes. The S&EIR process concentrates on assessing the potential consequences of radiological releases, including both routine operational emissions and upset conditions. Conversely, the NNR licensing process is designed to protect the public and environment from the harmful affects of radiation and to provide assurance that defence-in-depth strategies—comprising multiple, redundant, and independent safety systems—in the proposed plant's design and operations are sufficient to minimise the probability of events such as core meltdown or containment failure to

¹ The Emergency Response Assessment, Site Access Control Report and Human Health Risk Assessment

extremely low and acceptable levels. While both processes address the consequences of radioactive releases, the NNR framework additionally focuses on substantially reducing the likelihood of such occurrences.

The relationship between the EIA and NNR Processes is illustrated in Figure 1-5.

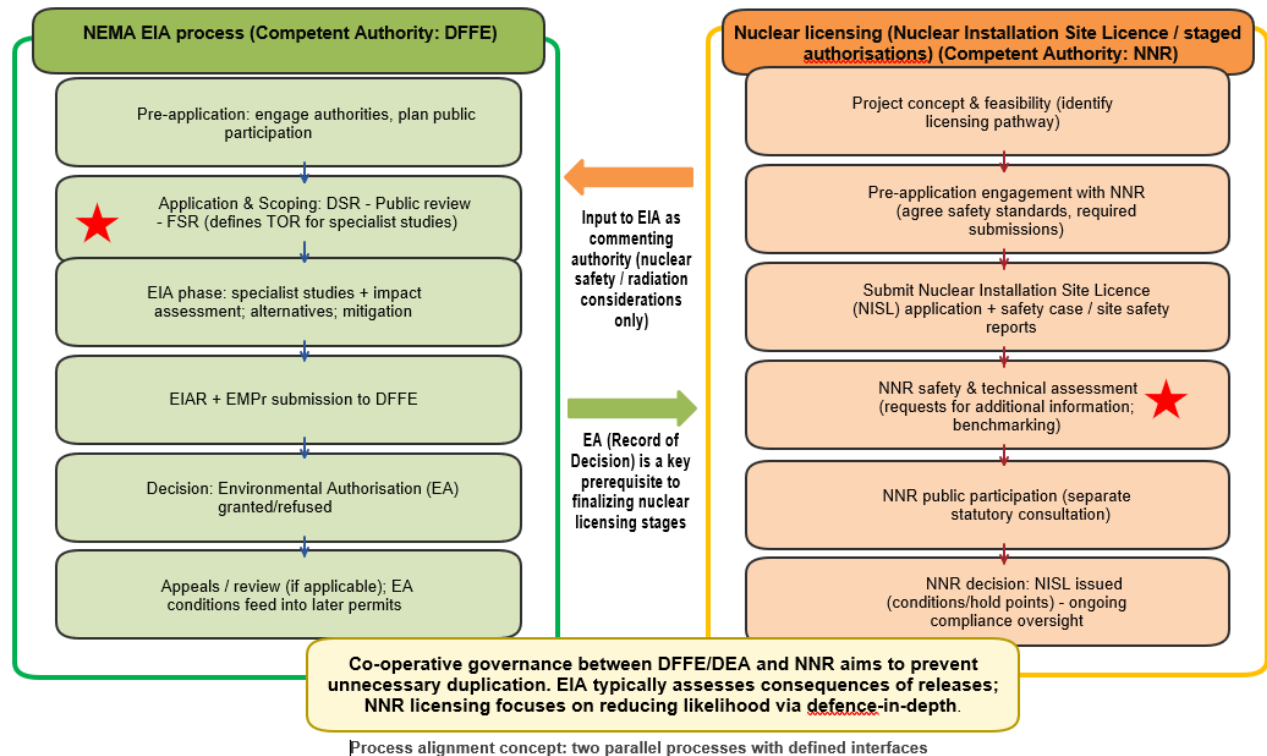


Figure 1-5 - Relationship between the NNR NISL and EIA Processes (Red stars denote the current status of each process)

1.5 DETAILS OF KEY ROLE PLAYERS

1.5.1 PROJECT PROPONENT

Eskom Holdings SOC Limited is the project proponent (Applicant) with regards to this application for the proposed NPP project. Table 1-5 provides the relevant details of the project proponent.

The Applicant is responsible for initiating the application, appointing an independent EAP, providing complete and accurate information, and ensuring compliance with the procedural and notification requirements of the NEMA EIA Regulations (notably Regulations 10, 12, 15, 16 and 67).

Table 1-5 – Details of Project Proponent

Proponent:	Eskom Holdings SOC Limited
Contact Person:	Deidre Herbst
Postal Address	Eskom Head Office, 1 Maxwell Drive, Sunninghill, Sandton, 2196
Telephone:	+27 11 800 3501

1.5.2 COMPETENT AUTHORITY

The Minister must be identified as the Competent Authority (CA), if the activity -

- Section 24C(2)(a): has implications for international environmental commitments or relations, and where- (i) it is identified by the Minister by notice in the Gazette
- GN 779 of 01 July 2016: identifies the Minister as the CA for the consideration and processing of environmental authorisations and amendments thereto for activities related the Integrated Resource Plan (IRP) 2010 – 2030
- Section 24C(2)(c): a development footprint that falls within the boundaries of more than one province or traverses international boundaries – it must be noted that the proposed development footprints do not traverse both provinces, but rather two separate footprints in two provinces as alternative locations.
- Section 24C(2)(d): is undertaken, or is to be undertaken, by- (ii) a provincial department responsible for environmental affairs or any other organ of state performing a regulatory function and reporting to the MEC

Furthermore, the applicant is Eskom Holdings SOC Ltd, which is a State-owned Company. As such, the DFFE is deemed to be the CA for the proposed NPP project, as detailed in Table 1-6.

The Competent Authority is responsible for administering, evaluating and deciding on applications in accordance with Regulations 3, 5–11, 24, 30, 34 and 35, ensuring lawful, informed and procedurally fair decision-making aligned with NEMA principles.

Table 1-6 – Competent Authority

Aspect	Competent Authority	Contact Details
Competent Authority: Environmental Authorisation	Department of Forestry, Fisheries, and the Environment (DFFE)	Case Officer: Mr Wayne Hector Deputy Director: Priority Infrastructure Projects Email: WHECTOR@dffe.gov.za DFFE Ref: 14/12/16/3/3/2/2806

1.5.3 COMMENTING AUTHORITY

The commenting authorities for the project include:

- Western Cape Department: Environmental Affairs and Development Planning (DEA&DP);
- Eastern Cape Department: Economic Development, Environmental Affairs and Tourism (DEDEAT);
- Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform (NCDAERL);
- Department of Water and Sanitation (DWS);
- Department of Mineral and Petroleum Resources (DMPR);
- Department of Electricity and Energy (DOEE);
- Petroleum Agency of South Africa (PASA);
- Department of Public Works;
- Department of Defence (DOD);
- National Department of Transport;
- South African National Roads Agency Limited (SANRAL);
- South African Heritage Resources Agency (SAHRA);

- Eastern Cape Provincial Heritage Resources Authority (ECPHRA);
- Heritage Western Cape (HWC);
- South African Civil Aviation Authority (CAA);
- South African Radio Astronomical Observatory (SARAO);
- South African Weather Service (SAWS);
- Relevant Local Government Authorities in respect of zoning, water services related activities;
- Bird Life South Africa;
- Endangered Wildlife Trust (EWT);
- CapeNature;
- South African National Parks (SANParks);
- Abalone Farmers Association of South Africa (AFASA);
- National Nuclear Regulator (NNR);
- Nuclear Energy Corporation of South Africa (NECSA);
- National Radioactive Waste Disposal Institute (NRWDI);
- Overberg District Municipality;
- Overstrand Local Municipality;
- Sarah Baartman District Municipality; and
- Kouga Local Municipality.

Refer to the Public Participation Report (PPR) in **Appendix B** for a comprehensive list of the commenting authorities.

1.5.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

WSP was appointed in the role of Independent EAP to undertake the S&EIR process for the proposed project. The CV of the EAP is available in **Appendix C.1**. The EAP declaration of interest and undertaking is included in **Appendix C.2**. Table 1-7 details the relevant contact details of the EAP.

The EAP is mandated to independently manage and conduct the environmental assessment process, ensuring compliance with Regulations 17, 19, 21, 28, 31 and 54, with a focus on objectivity, transparency, and the incorporation of environmental and stakeholder considerations.

Table 1-7 – Details of the EAP

EAP:	WSP Group Africa (Pty) Ltd
Contact Person:	Ashlea Strong / Brian Hayes
Physical Address:	Building 1, Maxwell Office Park, Magwa Crescent West, Waterfall City, Midrand, 1685
Telephone:	011 361 1392
EAP Qualifications:	■ Masters in Environmental Management, University of the Free State ■ B Tech, Nature Conservation, Technikon SA ■ National Diploma in Nature Conservation, Technikon SA
EAPASA Registration Number:	EAPASA (2019/1005) / EAPASA (2025/19616)

Statement of Independence

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment.

EAP and Legal Peer Review

WSP has appointed an external EAP and legal specialist to provide external peer review of the project documentation and legal process. The CV of the EAP and Legal Peer Reviewers are available in **Appendix D**. Table 1-7 details the relevant contact details of the EAP.

Table 1-8 – Details of the EAP and Legal Peer Reviewers

EAP Peer Reviewer	
Contact Person:	Sean O’Beirne (SE Solutions)
EAP Qualifications:	- BA Hons (Geography, 1st class) - MSc (Radar rainfall measurement) - Registered EAP
Legal Peer Reviewer	
Contact Person:	Caroline Pepermans (Pepermans Legal Consulting)
Qualifications:	- BSc in Entomology, - LLB - LLM in International Environmental Law

1.5.5 SPECIALISTS

Specialist input was required in support of this application for Environmental Authorisation (EA). The details of the specialists are provided in Table 1-9 below. The specialist declarations and qualifications are included in **Appendix E.1** and **Appendix E.2** respectively. The specialist studies are attached in **Appendix G**.

Table 1-9 – Details of Specialists

Assessment	Name of Specialists	Company	Qualifications	Specialist Report attached as
Dune Geomorphology	Dr Werner Illenberger	Illenberger & Associates	- BSc - BSc Honours - MSc - PhD	Appendix G1
Geological Hazard Assessment	Heather Davis	WSP	- Graduate Diploma in Civil Engineering in the field of Geotechnical Engineering - BSc (Honours) Engineering Geology and Geotechnics - ECSA	Appendix G2
Seismic Risk Assessment				
Geotechnical Characteristics				

Assessment	Name of Specialists	Company	Qualifications	Specialist Report attached as
Hydrology	Simon Lorentz	SRK Consulting	▪ Cert, Environmental Law ▪ MSc, Ag. Eng ▪ GDE, Civil Eng ▪ BSc, Civil Eng	Appendix G3
Geohydrology	Peter Rosewarne	SRK Consulting	▪ MSc, Hydrogeology ▪ BSc (Hons), Geology ▪ Pr. Sci. Nat. (South Africa), Reg. No.401474/83	Appendix G4
Freshwater Supply				Appendix G5
Air Quality Assessment	Dr Hanlie Liebenberg-Enslin	Airshed	▪ Ph.D Geography, ▪ MSc Geography and Environmental Management ▪ BSc Hons. Geography ▪ BSc Geography and Geology	Appendix G6
Aquatic Assessment / Wetlands	Dr Liz Day	The Liz Day Consulting	▪ BA (English) ▪ BSc (Zoology and Environmental and Geographical Science) ▪ BSc (honours- Zoology, first class) ▪ PhD (Zoology / Marine Biology) ▪ Registered Professional Natural Scientist by SACNASP (Reg No 004806)	Appendix G7
Terrestrial Fauna (Vertebrates and Invertebrates)	Martinus Erasmus	The Biodiversity Company	▪ B-Tech in Nature Conservation ▪ National Diploma in Nature Conservation, ▪ Pr Sci Nat (118630)	Appendix G8
	Sarah Newman	The Biodiversity Company	▪ MSc Entomology (Distinction) ▪ BSc (Hons) Zoology ▪ BSc Zoology ▪ Cand Nat Sci (158474)	
Terrestrial Biodiversity	Dr. David Hoare	BioCensus (Pty) Ltd	▪ PhD Botany ▪ SACNASP Reg. no. 400221/05 (Ecology, Botany)	Appendix G.9
Terrestrial Flora				Appendix G.10
Avifauna	Dr. Ryno Kemp	The Biodiversity Company	▪ PhD Zoology ▪ BSc Honours Zoology ▪ BSc Zoology ▪ PrSciNat	Appendix G.11

Assessment	Name of Specialists	Company	Qualifications	Specialist Report attached as
Marine Biology	Dr Barry Clark	Anchor Environmental	- PhD. Marine Biology - BSc (Hons) Marine Biology - BSc Zoology and Ocean & Atmosphere Science - PrSciNat	Appendix G.12
	Amy Wright		- MSc Biological Sciences, - BSc (Hons) Biological Sciences - BSc Marine Biology and Applied Biology - PrSciNat	
	Dr. Adam Rees		- PhD Marine Science - BSc (Hons) Marine Biology & Coastal Ecology - PrSciNat	
Marine Physical, Water Quality, Sediment Transport and Shoreline Change	Roy van Ballengooyen	WSP	- MSc Physical Oceanography (with distinction) - Certificate Project Management - BSc (Hons) Applied mathematics - BSc Applied Mathematics and Physical Oceanography - SACNSP - Membership No. 400435/04	Appendix G.13
Socio-Economic Assessment	Steve Horak	WSP	Master's in Environmental and Social Science	Appendix G.14
	Dr David Mullins	Conningarth Economists	D.Com (Economics)	
Visual Impact Assessment	Menno Klapwijk	Bapela Cave Klapwijk	BSc Landscape Architecture	Appendix G.15
Heritage Impact Assessment	Nic Wiltshire	CTS Heritage	- MPhil in Conservation of the Built Environment - MSc. with Distinction in Archaeology - BSc. Honours in Archaeology - BSc. Archaeology - BSc. Environmental and Geographic Science	Appendix G16
Agricultural Potential Assessment	Johann Lanz	SoilZA	- MSc. (Environmental Geochemistry) - BSc. Agriculture (Soil Science, Chemistry)	Appendix G.17

Assessment	Name of Specialists	Company	Qualifications	Specialist Report attached as
			BA (English, Environmental & Geographical Science)	
Noise Assessment	Kirsten Collett	WSP	- MSc, Atmospheric Sciences, - BSc (Honours) Geography and Environmental Studies - BSc, Geography and Environmental Studies - SACNASP	Appendix G.18
Human Health Risk Assessment	Dr Willie van Niekerk	INFOTOX	- BSc (Chemistry) - Hons BSc (Chemistry) - MSc (Chemistry) - PhD (Chemistry) - QEP (Qualified Environmental Professional), IPEP, USA	Appendix G.19
Traffic and Transportation	Johann Christoff Krogscheepers	ITS Innovative Transport Solutions	- Doctor of Philosophy (Ph.D.) - M.Eng (Transport) - Certificate in Arbitration - B.Eng. (Honours)	Appendix G.20
Radiological Impact Assessment	Johan Slabbert	PSI Risk Consultants	- B Sc Hons (Theoretical Physics) - MPhil-Environmental Management (Radioactive Waste) - Post-graduate theoretical training in Nuclear Engineering and Reactor Physics - Risk Assessment (Safety and Reliability Engineering)	Appendix G.21
Radioactive Waste Management and Transport	Dr Japie van Blerk	AquiSim Consulting	- PhD. – Geohydrology - MSc. (Cum Laude) – Geohydrology - BSc. (Hons. - Cum Laude) – Geohydrology - BSc. (Applied Math., Computer Science)	Appendix G.22
Climate Change Assessment	Kenneth Slabbert	Promethium Carbon	- BEng (Mechanical) - MEng (Mechanical)	Appendix G.23
	Shannon Murray		- BA (LLB) - Bachelor of Laws (LLB)	

Assessment	Name of Specialists	Company	Qualifications	Specialist Report attached as
			■ Certified Sustainability Reporting Manager (CSRM™)	
	Camden Nauschütz		■ MSc Degree (Animal, Plant and Environmental Sciences) ■ BSc Honours Degree (Animal, Plant and Environmental Sciences) ■ BSc Degree (Animal, Plant and Environmental Sciences)	
Spatial Planning Assessment	Claus Mischker	Headland Town Planners	■ B Tech (Town & Regional Planning) ■ Registered Professional Town and Regional Planner	Appendix G.24

All the specialist studies will undergo peer review. The purpose of the peer review is to provide an independent, objective, and expert assessment of specialist studies prepared as part of the NPP EIA phase, to ensure:

- Scientific and technical credibility;
- Compliance with applicable legislation and guidelines;
- Adequate identification and assessment of impacts; and
- Transparency and defensibility of conclusions.

The details of the specialists undertaking peer reviews are provided in Table 1-10. The peer review reports will only form part of the EIA phase of the process. The peer reviewer qualifications are included in **Appendix F**.

Table 1-10 – Details of Specialists undertaking Peer Reviews

Assessment	Name of Specialists Undertaking Peer Review	Company	Qualifications
Hydrogeological, freshwater supply and Hydrological Assessment	Sarah Skinner	WSP	■ MSc, Water Utilisation ■ BSc (Hons) Water Utilisation/ Waste management, ■ BSc (Hons), Geology & Hydrogeology ■ BSc, Geology & Chemistry ■ SACNASP
Aquatic Assessment / Wetlands	Shavaughn Davis	WSP	■ Master of Science, Zoology ■ Bachelor of Science (Hons), Zoology ■ Bachelor of Science, Zoology & Botany

Assessment	Name of Specialists Undertaking Peer Review	Company	Qualifications
Air Quality Assessment	Jared Lodder	WSP	- Master of Science, Geography - Batchelor of Arts (Honours), English and Geography - Batchelor of Arts, English and Geography
Terrestrial Biodiversity	Rudolph Greffrath	WSP	- B-tech Degree in Nature Conservation - National Diploma in Nature Conservation - SACNASP
Marine Biology	Dr Constanze Nina Steffani	Steffani Marine Environmental Consulting	- PhD Zoology - Professional Natural Scientist (Reg No 400122/07)
Marine Physical, Water Quality, Sediment Transport and Shoreline Change	Dr Andre van Tonder	Zutari	- PhD Civil Engineering - BEng (Hons) Civil Engineering - BEng Civil Engineering
Economic Impact Assessment and Tourism Impact Assessment	Richard Downing	Independent Economist	MCom. - Econometrics
Social Impact Assessment	Tony Barbour	Tony Barbour Environmental Consulting	- BSc (Geology and Economics) B. Economics (Honours) - MSc (Environmental Science)
Heritage Impact Assessment	Stefan de Kock	Perception Heritage Planning	- Environmental Impact Assessment Management: Post-Graduate Diploma - Urban & Regional Planning: Honours - Urban Design, Architectural & Urban Conservation (cum laude)
Agricultural Potential Assessment	Dr Darren Bouwer	Digital Soils Africa	- BSc Soil Science - BSc Honours Soils Science - MSc Hydrology and Soil Chemistry - PhD
Noise Assessment	Morne de Jager	Enviro Acoustic Research cc	- B.Eng (Chemical Engineering) - SACNASP (South African Council for Natural Scientific Professions) - 117253 - SAIOSH (SA Institute of Occupation Safety & Health) - 72765282
Emergency Response Assessment	Henriette van Graan	Independent (retired from NNR)	B.Sc. (Mathematics, Mathematical Statistics)

Assessment	Name of Specialists Undertaking Peer Review	Company	Qualifications
Radiological Impact Assessment			- B.Sc. (Hons. Mathematical Statistics and Operational Research) - M.Sc. cum laude (Reactor Science) - Certificate in Risk Management, - Registered as a Professional Natural Scientist in Physical Science
Site Control Assessment			
Beyond Design Accidents			
Radioactive Waste Management and Transport	Robin Heard	Independent (retired from IAEA)	- MBA with electives in Advanced Information Systems, Developing Management Skills, Business of the Environment, Economics and Taxation. (4 years of study) - Diploma in Datametrics - B.Sc. (Hons) (Geology) - B.Sc.
Climate Change Assessment	Kierra Chetty	WSP	- Master of Science Palaeontology - Bachelor of Science Honors Palaeontology - Bachelor of Science Environmental and Engineering Geology
Spatial Planning Assessment	Theunis Strydom	Plan Associates Development Planners (Pty) Ltd	- Bachelor Degree in Town and Regional Planning - Registered Professional Town and Regional Planner

1.6 SCOPING TERMS OF REFERENCE

The 2014 EIA Regulations (Government Notice Regulation (GNR) 982), as amended, identifies the proposed NPP development as an activity being subject to an S&EIR process due to the applicability of the EIA Listing Notice 2 (GNR 984, as amended).

As defined in Appendix 2 of GNR 982, as amended, the objective of the scoping process is to, through a consultative process:

- Identify the relevant policies and legislation relevant to the activity;
- Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- Identify the key issues to be addressed in the assessment phase;

- Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration, and probability of the impacts to inform the location of the development footprint within the preferred site; and
- Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.
- Public participation is a requirement of scoping; it consists of a series of inclusive interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed NPP project. The objectives of the public participation process can be summarised as follows:
 - Identify relevant individuals, organisations and communities who may be interested in or affected by the proposed project;
 - Clearly outline the scope of the proposed Project, including the scale and nature of the existing and proposed activities;
 - Identify viable proposed Project alternatives that will assist the relevant authorities in making an informed decision;
 - Identify shortcomings and gaps in existing information;
 - Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
 - Highlight the potential for environmental impacts, whether positive or negative; and
 - To inform and provide the public with information and an understanding of the proposed project, issues and solutions.

1.7 **FINAL SCOPING REPORT STRUCTURE**

As per the EIA Regulations 2014, as amended, Appendix 2 of GNR 982 identifies the legislated requirements that must be contained within a Scoping Report for the CA to consider and come to a decision on the application. Table 1-11 below details where the required information is located within this report.

Table 1-11 – Legislated Report Requirements as detailed in GNR 982

Appendix 2 of GNR 982	Description	Relevant Report Section
(a)	Details of	
	the EAP who compiled the report; and	Section 1.5.4
	the expertise of the EAP, including a Curriculum Vitae	Appendix C1
(b)	The location of the activity, including-	
	The 21-digit Surveyor code for each cadastral land parcel;	Table 1-2
	Where available, the physical address and farm name	

Appendix 2 of GNR 982	Description	Relevant Report Section
	Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property.	Table 1-3 and Table 1-4
(c)	A plan which locates the proposed activities applied for at an appropriate scale, or, if it is-	
	A linear activity, a description of the corridor in which the proposed activity or activities is to be undertaken; or	N/A
	On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	Table 1-3 and Table 1-4
(d)	A description of the proposed activity, including	
	All listed and specified activities triggered;	Section 7.5
	A description of the activities to be undertaken, including associated structures and infrastructure;	Section 4
(e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 7
(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 5
(h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including-	
	Details of all the alternatives considered;	Section 6
	Details of the public participation undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 2.6 and Appendix B
	a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 2.6 and Appendix B
	the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 8 and Section 9
	the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Section 10
	the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 2.5

Appendix 2 of GNR 982	Description	Relevant Report Section
	positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 10
	the possible mitigation measures that could be applied and level of residual risk;	Section 10
	the outcome of the site selection matrix;	Section 10
	if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	Section 6
	a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 11.4 and Section 11.5
(i)	A plan of study for undertaking the environmental impact assessment process to be undertaken, including-	
	a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Section 11.4 and Section 11.5
	a description of the aspects to be assessed as part of the environmental impact assessment process;	Section 11.6
	aspects to be assessed by specialists;	Section 11.7
	a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	Section 11.8
	a description of the proposed method of assessing duration and significance;	Section 11.8
	an indication of the stages at which the competent authority will be consulted;	Section 2, Section 11.10 and Appendix B
	particulars of the public participation process that be conducted during the environmental impact assessment process; and	Section 2.6, Section 11.10 and Appendix B
	a description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 11
(j)	An undertaking under oath or affirmation by the EAP in relation to-	
	the correctness of the information provided in the report;	Appendix C.2
	the inclusion of comments and inputs from stakeholders and interested and affected parties; and	

Appendix 2 of GNR 982	Description	Relevant Report Section
	any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	
(k)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Appendix C.2
(l)	Where applicable, any specific information required by the competent authority; and	Not yet Applicable
(m)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	Not yet Applicable

2 S&EIA PROCESS

2.1 OBJECTIVES OF THE S&EIR PROCESS AS PER THE PROCEDURAL FRAMEWORK

The S&EIR process consists of various phases with associated timelines as defined in the EIA Regulations of 2014, as amended (GNR 982). The process can generally be divided into four main phases, namely, (i) a Pre-application Phase, (ii) an Application and Scoping Phase (current phase), (iii) an Impact Assessment Phase and (iv) Authorisation and Appeal Phase.

The main objectives of the phases can be described as follows:

- Pre-Application Phase (**Complete**):
 - Although not a formally prescribed phase in the Regulations, this phase is critical to ensuring procedural compliance and efficient progression through the regulated process.
 - Undertake consultation meetings with the relevant authorities to confirm the required process, the general approach to be undertaken and to agree on the public participation plan; and
 - Identify stakeholders, including neighbouring landowners/residents and relevant authorities.
- Application and Scoping Phase (**Current**):
 - This phase is formally regulated and must comply with specific provisions of the EIA Regulations.
 - Compile and submit application forms to the CA and pay the relevant application fees;
 - Compile a DSR describing the affected environment and present an analysis of the potential environmental issues and benefits arising from the proposed project that may require further investigation in the Impact Assessment Phase;
 - Develop draft terms of reference for the specialist studies to be undertaken in the Impact Assessment Phase;
 - Inform stakeholders of the proposed project, feasible alternatives and the S&EIR process and afford them the opportunity to register and participate in the process and identify any issues and concerns associated with the proposed project;
 - Incorporate comments received from stakeholders during the DSR comment period;
 - Should significant amendments be required, release the updated DSR for a 30-day comment period to provide stakeholders with the opportunity to review the amendments as well as provide additional input if required. WSP confirms that no substantive changes have been made to the FSR. Additions and changes are only as a result of Authority / public comments, requests and recommendations; and
 - Submit the Final Scoping Report (FSR), following the consultation period, to the relevant authorities, in this case the DFFE, for acceptance/rejection.
- Impact Assessment Phase (**Not yet applicable**):
 - This phase is triggered upon acceptance of the FSR and is subject to detailed regulatory requirements.
 - Continue to inform and obtain contributions from stakeholders, including relevant authorities, stakeholders, and the public and address their relevant issues and concerns;

- Assess in detail the potential environmental and socio-economic impacts of the project as defined in the FSR;
 - Identify environmental and social mitigation measures to avoid and/or address the identified impacts;
 - Develop and/or amend environmental and social management plans based on the mitigation measures developed in the Environmental Impact Assessment Report (EIAR); and
 - Submit the EIAR and the associated the Environmental Management Programme (EMPr) to the CA to undertake the decision-making process.
- **Authorisation and Appeal Phase (Not yet applicable):**
- This phase is governed by the decision-making and appeals provisions of the EIA Regulations.
 - The DFFE to provide written notification of the decision to either grant or refuse EA for the proposed project; and
 - Notify all registered stakeholders of the decision and right to appeal.

The S&EIR process being followed for the proposed NPP EA application is depicted in Figure 2-1, along with relevant legislated timeframes and potential dates, noting that the dates can differ slightly.

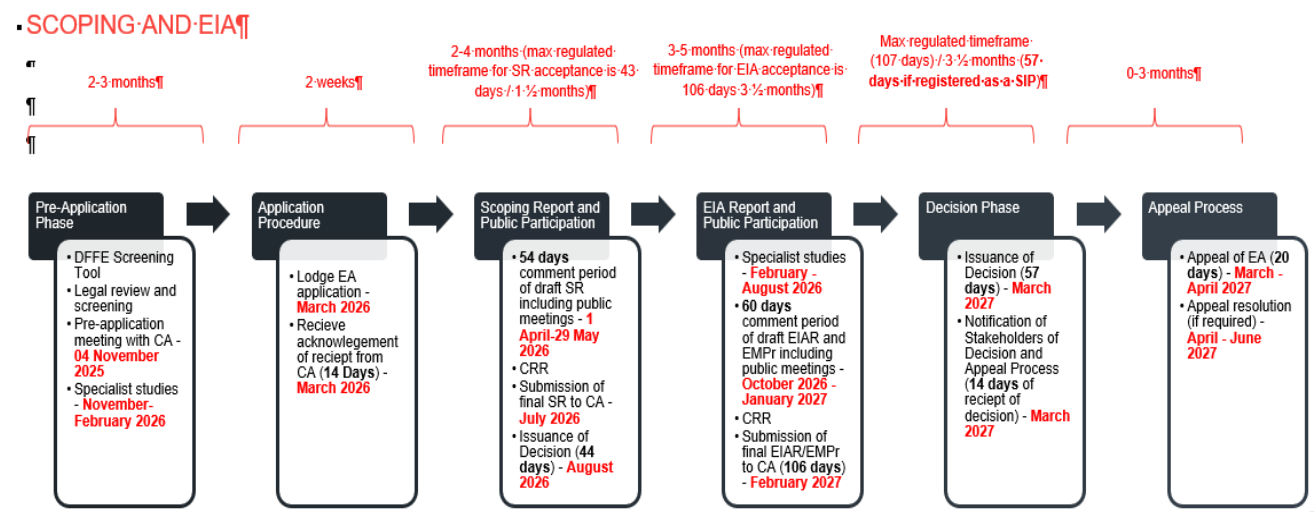


Figure 2-1 – S&EIR Process for the Proposed NPP

2.2 DFFE WEB-BASED ENVIRONMENTAL SCREENING TOOL

DFFE developed the National Web-based Environmental Screening Tool in order to flag areas of potential environmental sensitivity related to a site as well as a development footprint and produces the screening report required in terms of regulation 16 (1)(v) of the EIA Regulations (2014, as amended). The Notice of the requirement to submit a report generated by the national web-based environmental screening tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No. 107 of 1998) and Regulation 16(1)(b)(v) of the EIA Regulations of 2014, as amended (GN 960 of July 2019) states that the submission of a report generated from the national web-based environmental screening tool, as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations of 2014, published under Government Notice No. R982 in Government Gazette No. 38282 of 4 December 2014, as amended, is compulsory when submitting an application for environmental authorisation in terms of

Regulation 19 and Regulation 21 of the EIA Regulations, 2014 (as amended) as of 04 October 2019.

The Screening Report generated by the National Web-based Environmental Screening Tool contains a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development footprint as well as the most environmentally sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected.

Screening Reports for the proposed NPP were generated for both sites on 10 February 2026 and are attached as **Appendix H**. The Screening Reports for the project identified various sensitivities for both sites. The reports also generated a list of specialist assessments that should form part of the S&EIR based on the development type and the environmental sensitivity of both sites. Assessment Protocols in the reports provide minimum information to be included in a specialist report to facilitate decision-making. Table 2-1 depicts the sensitivities identified in the DFFE Screening Reports for both sites.

Table 2-1 – Sensitivities identified in the DFFE Screening Reports

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Bantamsklip = X Thyspunt = O				
Agricultural Theme	O	X		
Animal Species Theme		X O		
Aquatic Biodiversity Theme	X O			
Archaeological and Cultural Heritage Theme	O	X		
Civil Aviation Theme		X	O	
Defence Theme				X O
Palaeontology Theme	X O			
Plant Species Theme		O	X	
Terrestrial Biodiversity Theme	X O			

In addition to having to undertake the above-related specialist studies, the DFFE Screening Tools further identified the following additional studies that must be undertaken:

- Landscape / Visual Impact Assessment
- Marine Impact Assessment
- Hydrology Assessment
- Radioactivity Impact Assessment
- Traffic Impact Assessment
- Geotechnical Assessment
- Climate Impact Assessment

- Health Impact Assessment
- Seismicity Assessment

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report:

- Dune Geomorphology
- Geological Hazard Assessment
- Seismic Risk Assessment
- Geotechnical Characteristics
- Hydrology
- Geohydrology
- Freshwater Supply
- 1:100 Floodline
- Air Quality Assessment
- Flora Assessment
- Aquatic Assessment (including Wetlands)
- Vertebrate Fauna
- Invertebrate Fauna
- Marine Biology
- Marine Physical, Water Quality, Sediment Transport and Shoreline Change Study
- Economic Impact Assessment
- Social Impact Assessment
- Visual Impact Assessment
- Heritage and Palaeontology Impact Assessment
- Agricultural Potential Assessment
- Tourism Impact Assessment
- Noise Assessment
- Human Health Risk Assessment
- Traffic and Transportation
- Emergency Response Assessment
- Site Control Assessment
- Beyond Design Accidents
- Radioactive Waste Management and Transport
- Climate Change Assessment
- Spatial Planning Assessment
- Conservation Offsets

2.2.1 MOTIVATION FOR SPECIALIST STUDIES

The report recognises that “it is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation.”

Table 2-2 outlines the specialist assessments that have been commissioned for the project based on the environmental sensitivities identified by the Screening Reports.

Table 2-2 – Specialist Studies identified by the DFFE Screening Reports

Specialist Study Identified	Specialist Study Commissioned	Specialist	Motivation to Exclude
Agricultural Impact Assessment	Yes	Johann Lanz – SoilZA	N/A
Animal Species Assessment	Yes	Martinus Erasmus; Sarah Newman – The Biodiversity Company	N/A
Aquatic Biodiversity Impact Assessment	Yes	Shavaughn Davis – WSP Group Africa (Pty) Ltd	N/A
Archaeological and Cultural Heritage Impact Assessment	Yes	Nicholas Wiltshire – CTS Heritage	N/A
Civil Aviation Assessment	No – the Compliance Statement will be compiled by the EAP	N/A	According to the DFFE Screening Tool Reports, civil aviation is regarded as having medium sensitivity at the Thyspunt site as it is between 8 and 15 km of other civil aviation aerodrome; and high sensitivity at the Bantamsklip site as it is also between 8 and 15 km of other civil aviation aerodrome, and because of a dangerous and restricted airspace as demarcated. Therefore, a compliance statement is required as per the protocol specifications. The purpose of the Air Traffic and Navigation Services (ATNS) is to evaluate the impact on Obstacle Limitation Surfaces (OLS) in an Obstacle Analysis Report, which defines protected airspace around airports and flight paths, and flight safety. The South African Civil Aviation Authority (SACAA) regulates obstacle assessments under the Civil Aviation Act (2009) and Civil Aviation Regulations Part 178. Any nuclear project must submit an Obstacle Analysis Report to SACAA for approval before construction begins. For a nuclear facility in South Africa: Tall Structures: Reactor buildings and weather masts often exceed 50–100 meters, making them potential aviation obstacles. Site Location: Proximity to airports or flight paths increases the likelihood of stricter requirements, highlighting the no-flight zone requirements.

Specialist Study Identified	Specialist Study Commissioned	Specialist	Motivation to Exclude
			Safety Integration: Obstacle analysis ensures that the nuclear project does not compromise aviation safety, while also aligning with environmental and public safety regulations. ATNS and SACAA have been included on the project stakeholder database. They have been informed of the proposed project, and comments have been sought from them (Refer to Appendix B). Furthermore, an application for the Approval of Obstacles will be submitted to ATNS/SACAA and the required permits will be obtained prior to the development of the project.
Defence Assessment	No	N/A	According to the DFFE Screening Tool Report, Defence is regarded as having low sensitivity at both sites. Therefore, a compliance statement is not required as per the protocol specifications. The Department of Defence has been included on the project stakeholder database, informed of the proposed project and comments have been sought (Refer to Appendix B).
Palaeontology Impact Assessment	Yes	Nicholas Wiltshire – CTS Heritage	N/A
Plant Species Assessment	Yes	Martinus Erasmus – The Biodiversity Company	N/A
Terrestrial Biodiversity Impact Assessment	Yes	Martinus Erasmus; Sarah Newman – The Biodiversity Company	N/A
Landscape/Visual Impact Assessment	Yes	Menno Klapwijk – Bapela Cave Klapwijk	N/A
Marine Impact Assessment	Yes	Dr Barry Clark – Anchor Environmental	N/A
Hydrology Impact Assessment	Yes	Simon Lorentz – SRK Consulting	N/A
Radioactivity Impact Assessment	Yes	Johan Slabbert – PSI Risk Consultants	N/A
Traffic Impact Assessment	Yes	Johann Christoff Krogscheepers – ITS Innovative Transport Solutions	N/A

Specialist Study Identified	Specialist Study Commissioned	Specialist	Motivation to Exclude
Geotechnical Assessment	Yes	Heather Davis – WSP Group Africa (Pty) Ltd	N/A
Climate Impact Assessment	Yes	Kenneth Slabbert – Promethium Carbon	N/A
Health Impact Assessment	Yes	Dr Willie van Niekerk – INFOTOX	N/A
Seismicity Assessment	Yes	Heather Davis – WSP Group Africa (Pty) Ltd	N/A
Socio-Economic Assessment	Yes	Steve Horak – WSP Group Africa (Pty) Ltd; Dr David Mullins – Conningarth Economists	N/A

Specialist assessments will be conducted in accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes, which were promulgated in Government Notice No. 320 of 20 March 2020 and in Government Notice No. 1150 of 30 October 2020 (i.e. “the Protocols”). The assessment protocols followed as well as the Site Sensitivity Verification (SSV) undertaken by the specialists are indicated in Section 9 and **Appendix I**.

Where relevant, specific reference will be given to other environmental management guidelines and tools. In this instance, the scope of the applicable specialist studies will, amongst other aspects, be aimed at determining the impact on sensitive or vulnerable areas or receptors in the relevant geographic range of the proposed project.

During the public participation phase, the outcomes of the identified impacts, specific to the geographical region, will in collaboration with the relevant specialists, conservation stakeholders, regulators and landowners, be circularised and thoroughly canvassed.

The objective is to ensure that an inclusive and transparent consultation process between relevant, informed, suitably qualified and experienced stakeholders, culminate in a comprehensive strategic and bespoke EMP, will be implemented for the duration of the project.

2.3 APPLICATION FOR ENVIRONMENTAL AUTHORISATION

The application phase consisted of a pre-application consultation with DFFE and subsequently completing the appropriate application form as well as the submission and registration of the application for EA with the DFFE. The pre-application meeting was held with DFFE on 04 November 2025 (meeting minutes included in **Appendix J**). The application form was submitted to the DFFE with the DSR on 31 March 2026. The DFFE confirmed receipt of the application on 01 April 2026 and allocated the following reference number to the application – 14/12/16/3/3/2/2806.

A letter for an extension request in terms of Regulation 3(7) of the 2014 NEMA EIA Regulations, as amended (the EIA Regulations) was submitted to the DFFE on 20 April 2026, to request a 30-day extension of the prescribed forty-four (44) day timeframe within which the final SR is to be submitted to the DFFE. The motivation for the request was based on concerns raised by interested and affected parties (I&APs) indicating that the statutory 30-day timeframe was insufficient to review the volume

and technical nature of information made available during the scoping phase. The DFFE approved the request. Of the 30-days, 20-days were allocated to the public for review and the remaining 10-days were retained for considered of the anticipated volume of comments. However, due to the floods that occurred in the Eastern Cape towards the end of the first week of May 2026, a couple of key meetings had to be postponed and the public review period was again extend by an additional 4 days (review ending on 29 May 2026) such that these meeting could be rescheduled.

A second letter for an extension request in terms of Regulation 3(7) of the 2014 NEMA EIA Regulations, as amended (the EIA Regulations) was submitted to the DFFE on 4 June 2026, to request a further 35-day extension of the prescribed timeframe within which the final SR is to be submitted to the DFFE. The motivation for the request was based on the high level of stakeholder interest, reflected in the volume and substantial nature of comments received from I&APs, an extension was required to allow the EAP and Applicant sufficient time to finalise the comment-and-response report and revise the scoping report. The DFFE approved the request and the FSR is now due to be submitted on 23 July 2026.

2.4 BASELINE ENVIRONMENTAL ASSESSMENT

The description of the environmental attributes of both the project areas was compiled through a combination of desktop reviews and site investigations. Desktop reviews made use of available information including existing reports, aerial imagery, and mapping. The specialist teams undertook site investigations, between November 2025 and January 2026, to identify sensitive features on site that informed the sensitivity mapping for both areas of the proposed project.

2.5 IMPACT ASSESSMENT METHODOLOGY

2.5.1 ASSESSMENT OF IMPACTS AND MITIGATION

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The methodology chosen for this project has been adapted from the “Draft Best Practice Guidelines for Implementing the Mitigation Hierarchy in South Africa” (February 2023) developed through a collaboration between the Endangered Wildlife Trust, BirdLife South Africa and Enviro-Insight, with funding from Rand Merchant Bank; and is intended to support improved implementation of the mitigation hierarchy by specialists, environmental assessment practitioners and developers

In the absence of clear Thresholds of Concern (ToC) and Limits of Acceptable Change (LAC) against which to evaluate the likely significance of impacts and risks, use of a risk-based approach is recommended (Figure 2-2), moderated by consideration of the potential for irreplaceable loss of resources and the need for a precautionary approach where consequences could be major and there is high uncertainty about impact predictions.

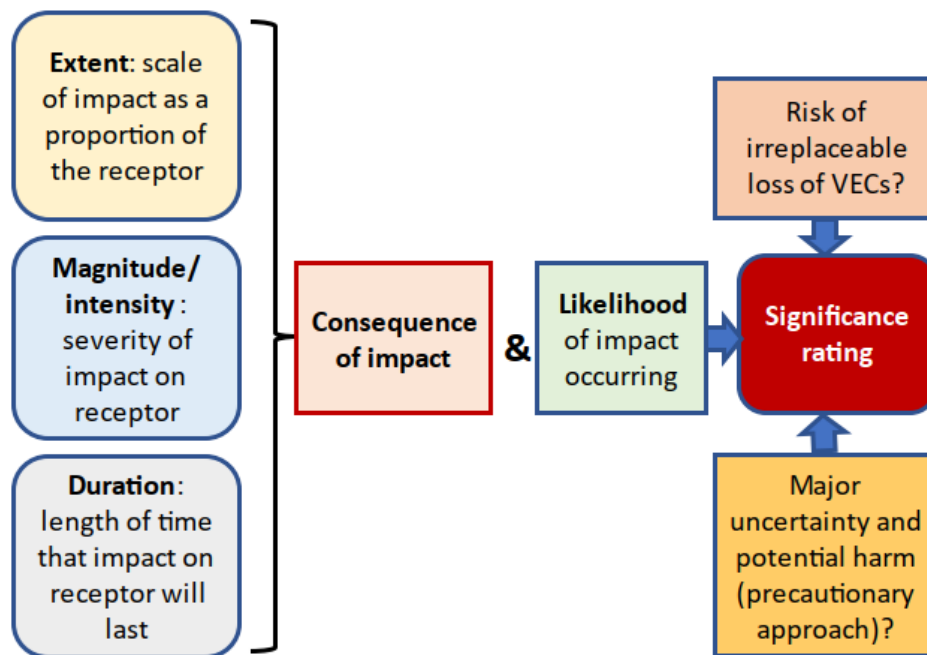


Figure 2-2 – Determining the significance of impacts in the absence of ToC and LAC

The ‘consequence’ adopts a proxy measure of the largest/highest rating from the assessment of likely magnitude against extent (i.e. at what spatial scale would an impact be measurable), and magnitude against duration (i.e. over what time period would an impact last). Ratings of magnitude, extent and duration should be scaled to reflect categories of seriousness, from the maximum of ‘very high’ (e.g. an extent which includes most or all of the spatial distribution of a threatened ecosystem or species, severe magnitude, and permanent duration) to ‘very low’ (e.g. very small area, negligible magnitude and ephemeral), as outlined in Table 2-3. Table 2-4 outlines the criteria for determining Duration, Extent and Magnitude.

Table 2-3 – Determining the Consequence rating of an impact (the higher of the magnitude/extent, or magnitude/duration scores)

The Higher of Duration or Extent Score						
Magnitude		Very Low	Low	Moderate	High	Very High
	Very High	Very High	Very High	Very High	Very High	Very High
	High	High	High	Very High	Very High	Very High
	Moderate	Moderate	Moderate	High	High	Very High
	Low	Low	Moderate	Moderate	High	Very High
	Very Low	Very Low	Low	Moderate	High	Very High

Table 2-4 – Criteria for Magnitude, Duration and Extent

CRITERIA	Very low	Low:	Medium:	High:	Very High:
Impact Magnitude (M): The degree of alteration of the affected environmental receptor	No impact on processes	Slight impact on processes	Processes continue but in a modified way	Processes temporarily cease	Permanent cessation of processes
Impact Extent (E): The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Duration (D): The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite

The likelihood of the impact occurring would range from ‘definite’ to ‘highly unlikely’, drawing on experience from similar developments and activities in comparable environments. The combination of consequence and likelihood is used to determine a significance rating (Table 2-5), which is then modified to take into account uncertainty/confidence levels, and potential for irreplaceable loss of resources as described below. Once the impact significance rating has been determined, refer to the relevant implications for mitigation as outlined in Table 2-6..

Table 2-5 – Using Consequence and Likelihood to determine significance ratings

	Likelihood					
		Highly Unlikely	Unlikely but Possible	Likely	Highly likely	Definite
Consequence	Very High	Moderate	High	Very High	Very High	Very High
	High	Low	Moderate	High	Very High	Very High
	Moderate	Very Low	Low	Moderate	High	High
	Low	Very Low	Very Low	Low	Low	Low
	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low

Modifications to the significance rating should be made:

- Where there is a risk of irreplaceable loss of resources identified as VECs and high uncertainty in impact predictions, rating of significance should be set at ‘very high’, taking a risk-averse and cautious approach.
- Where there is high uncertainty in impact predictions (e.g. with unprecedented type of development, or where there are major gaps in baseline data) and a threat of significant negative impacts (e.g. major loss of ecological infrastructure and associated ecosystem services should a ‘worst case’ scenario develop), significance ratings should be increased, similarly taking a risk-averse and cautious approach.

Table 2-6 – Thresholds of Concern, impact significance, and the mitigation hierarchy

Description of impacts above Thresholds of Concern, and Limit of Acceptable Change	Impact Significance	Implications for Mitigation
Negative impacts in this category cannot be remedied because of the irreplaceability of affected resources. Impacts in this category are of the highest magnitude, duration and/or extent, and would generally be unacceptable.	Very High	These impacts constitute a fatal flaw to the proposed development. The activity(ies) should not be authorised unless highly exceptional circumstances can be demonstrated. These negative impacts must be avoided or prevented, as they cannot be remedied; compensation or offsets would not be feasible.
Limit of Acceptable Change		
Negative impacts (including the proposed development's contribution to cumulative impacts) would result in environmental quality and/or Valued environmental components (VECs) approaching the Limit of Acceptable Change, and/or would be long term, of major concern, and/or be large scale/affect a large area.	High	Effort should be prioritised to avoid negative impacts by exploring spatial alternatives (location, siting, layout, routing options) and temporal avoidance. Minimisation of impacts is essential when further avoidance is demonstrably not feasible. Restoration of areas disturbed or degraded by the proposed development must be undertaken. Where residual negative impacts of 'high' significance remain, biodiversity offsets/compensation must be provided.
Threshold of major concern		
Negative impacts in this category could mean a deterioration in environmental quality or VECs. Negative impacts are of some concern, could endure in the medium to long term, and/or affect a considerable area.	Moderate	Effort should be made to avoid negative impacts by exploring spatial alternatives, design, technology, temporal and operational alternatives. Minimisation of impacts is essential, when further is demonstrably not feasible. Restoration of areas disturbed or degraded by the proposed development must be undertaken. Where residual negative impacts of 'medium' significance remain, biodiversity offsets/compensation must be provided.
Threshold of Potential Concern		
Negative impacts in this category could lead to some localised and minor deterioration in environmental quality in the short term, but affected components are not considered to be VECs.	Low	The focus is on avoidance and minimisation of impacts as far as possible. Rehabilitation/restoration would minimise residual negative impacts.

Description of impacts above Thresholds of Concern, and Limit of Acceptable Change	Impact Significance	Implications for Mitigation
		Biodiversity offsets or compensation would not be required.
Threshold of Low Concern		
Negative impacts in this category affect highly modified areas not considered to be VECs.	Very Low	The focus would be on seeking opportunities to rehabilitate/restore degraded areas and improve ecological infrastructure (as an enhancement measure, rather than to mitigate negative impacts). Biodiversity offsets or compensation would not be required.
Threshold of negligible concern		

2.5.1.1 Impact Mitigation

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in Figure 2-3 below.

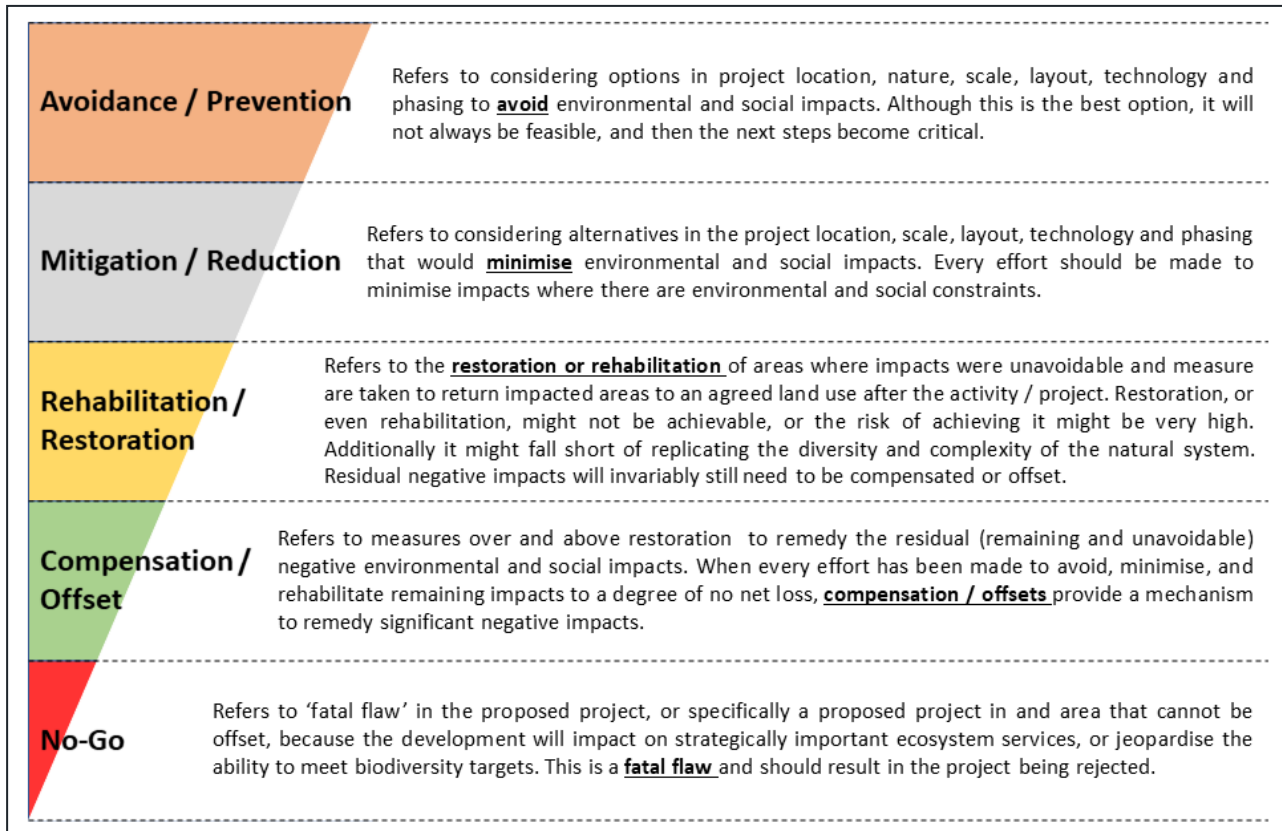


Figure 2-3 – Mitigation Sequence/Hierarchy

The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

2.6 STAKEHOLDER ENGAGEMENT PROCESS

Stakeholder engagement (public participation) is a requirement of the S&EIR process. It consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR decision-making process. Effective engagement requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed project. The objectives of the stakeholder engagement process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the proposed project;

- Clearly outline the scope of the proposed project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed project, issues, and solutions.

A Public Participation Report (PPR) has been attached as **Appendix B** detailing the project's compliance with Chapter 6 of the NEMA EIA Regulations 2014, as amended.

2.6.1 STAKEHOLDER IDENTIFICATION

Stakeholders were identified and will continue to be identified through several mechanisms. These include:

- Utilising the existing Nuclear 1 EIA stakeholder database;
- Utilising additional existing databases from other projects in the area;
- Advertising in the press;
- Placement of community site notices;
- Completed comment sheets;
- Attendance registers at meetings; and
- Discussions by the EAP with the applicant who is familiar with the area.

All stakeholders identified to date have been registered on the project stakeholder database. The EAP endeavoured to ensure that individuals/organisations from referrals and networking were notified of the proposed NPP project. Stakeholders were identified at the horizontal (geographical) and vertical extent (organisations level).

A list of stakeholders captured in the project database is included in the PPR in **Appendix B**.

2.6.1.1 STAKEHOLDER NOTIFICATION

Direct Notification

Notification of the proposed NPP project was issued to potential and existing stakeholders, via direct correspondence (i.e., emails and SMSs) on 21 November 2025. The notification letter that was circulated is included in Appendix B-3 of the PPR (**Appendix B**).

Virtual Information Sessions

Two virtual public information sessions were held on 02 and 03 December 2025. The objective of these sessions was to notify existing and potential stakeholders of the proposed NPP project, providing background information and obtaining initial feedback from the stakeholders. A copy of the presentation and meeting minutes is included in Appendix B-5 of the PPR (**Appendix B**).

Newspaper Advertisements

In accordance with the requirements of GNR 982, as amended, the proposed NPP project has been advertised in national and local newspapers. The purpose of the advertisements were to notify the public about the proposed project and to invite them to register as stakeholders. Copies of the

advertisements are included in Appendix B-1 of the PPR (**Appendix B**). The relevant scoping phase advertisement dates are listed in **Table 2-7**, along with the respective newspapers.

Table 2-7 – Dates on which the Newspaper Advertisements were published

Newspaper	Reach	Date of Publication	Publication Language
Media 24 online website	National	16 November 2025	English, Afrikaans, Xhosa
Isolezwe Lesixhosa	Regional (EC)	27 November 2025	Xhosa only
Sunday Times	National	16 November 2025	English only
Cape Times	Regional (WC)	19 November 2025	English, Xhosa
Burger	Regional (WC)	19 November 2025	English, Afrikaans
Daily Despatch	Regional (EC)	19 November 2025	English, Afrikaans, Xhosa
EP Herald	Regional (EC)	19 November 2025	English, Afrikaans, Xhosa
Village News	Local (WC)	21 November 2025	Eng English, Afrikaans, Xhosa
Kouga Express	Local (EC)	20 November 2025	English, Afrikaans, Xhosa
Go and Express (PE)	Local (EC)	20 November 2025	English, Afrikaans, Xhosa
Hermanus Times	Local (WC)	21 November 2025	English, Afrikaans, Xhosa
Suidernuus	Local (WC)	21 November 2025	English, Afrikaans, Xhosa
Gemsbok	NC	21 November 2025	English, Afrikaans
Platteland	NC	21 November 2025	English, Afrikaans

Radio Broadcasts

The proposed NPP project was also broadcasted on local radio stations. The purpose of the radio broadcasts was to notify the public about the proposed project, to invite them to register as stakeholders and inform on the initial virtual information sessions that were held on 02 and 03 December 2025. A copy of the radio broadcast advertisements is included in Appendix B-1 of the PPR (**Appendix B**). The respective radio stations and advertisement broadcast dates are listed in Table 2-8.

Table 2-8 – Radio Broadcasts

Radio	Listenership	Date of Broadcast	Broadcast Language
Bay FM (EC)	23 000	26 – 28 November 2025	English, Afrikaans, Xhosa
Kingfisher (EC)	8 000	25 – 26 November 2025	English, Afrikaans, Xhosa
Kouga FM (EC)	7 000	26 – 28 November 2025	English, Afrikaans, Xhosa

Radio	Listenership	Date of Broadcast	Broadcast Language
Caledon FM (WC)	17 000	26 – 30 November 2025	English, Afrikaans
Radio Overberg (WC)	9 000	25 – 28 November 2025	English, Afrikaans
Whale Coast FM (WC)	3 000	26 – 30 November 2025	English, Afrikaans, Xhosa

Site Notices

The official site notices were erected as per GNR 982, as amended, at both access gates at both proposed sites. In addition, general project notices, announcing the proposed NPP project and inviting stakeholders to register, were placed at various locations in and around both potential project areas. The site notices were erected between 26 and 30 January 2026. A copy of the site notices and proof of placement are included in Appendix B-3 of the PPR (**Appendix B**). **Figure 2-4** and **Figure 2-5** illustrate the locations that site notices were erected.



Figure 2-4 – Site note placement near Bantamsklip



Figure 2-5 – Site notice placement near Thyspunt

Stakeholder Consultation

During the pre-application public information meetings undertaken by the public participation and social team, a number of focus group meetings (FGMs) were held, as detailed in **Table 2-9**. The meeting minutes of each FGM are included within Appendix B-4 of the PPR (**Appendix B**).

Table 2-9 – Pre-application Public Information Meetings

Stakeholder	Date of Meeting
Overstrand Local Municipality	27 January 2026
Blue Horizon Abalone Farm	27 January 2026
Gary Koekemoer (WESSA)	28 January 2026
Thyspunt Alliance	29 January 2026
Kouga Local Municipality Councillor	29 January 2026
Kouga Local Municipality	30 January 2026
Thyspunt Nuclear Development Foundation	30 January 2026
Kouga Small Business Council	30 January 2026

The objective of these meetings was to inform these stakeholders of the proposed project, providing background information and to obtain some initial feedback on the project.

2.6.2 PUBLIC REVIEW

The DSR was placed for public review for a period of 30 days from 01 April 2026 to 05 May 2026, with an extension granted until 25 May 2026 and again until 29 May 2026, allowing for a 54 day public review period, at the following public locations, as detailed in Table 2-10. Proof of display is included in Appendix B of the PPR (**Appendix B**).

Table 2-10 – Locations for DSR Public Review

Area	Public Location	Address
Bantamsklip	Hermanus Public Library	1 Magnolia Street, Hermanus, 7200
	Stanford Public Library	155 Queen Victoria Street, Stanford, 7210
	Gansbaai Public Library	C/O Main and Kapokblom Street, Gansbaai, 7220
	Eluxolweni Public Library	3 Holomisa Street, Eluxolweni, Pearly Beach, 7220
	Buffeljachtsbaai Public Library	Buffeljachtsbaai
	Bredasdorp Library	5 Church Street, Bredasdorp, 7280
	Welverdiend Library	56 Ou Meule Street, Bredasdorp, 7280
	Elim Library	Skool Street, Elim, 7284
Thyspunt	Jeffreys Bay Public Library	43 Diaz Road, Jeffreys Bay, 6330
	Humansdorp Public Library	9 Bureau Street, Humansdorp, 6300
	Sea Vista Library	Geelbek Street, St Francis Bay, 6312
	Kouga Local Municipality – St Francis Bay	1 Assisi Drive, St Francis Bay, 6312
	Oesterbaai Eiendomme	Tornyn Street, Oyster Bay, 6331
	Coastal Collective	2 Suffolk Lane, Cape St Francis, 6313
Electronic Copy: Datafree Website	https://wsp-engage.com/	
WSP Website	https://www.wsp.com/en-za/services/public-documents	
Eskom Megawatt Park	1 Maxwell Drive, Sunninghill, Sandton, 2196	
WSP Cape Town Office	The Pavilion, 1 st Floor, Corner Portwood and Beach Rd, Waterfront, Waterfront, 8001	
WSP Midrand Office	Building 1, Maxwell Office Park, Magwa Crescent West, Waterfall City, Midrand, 1685	
The Draft Reports were made available to Commenting Authorities via a One Drive link.		

This FSR, inclusive of all comments and responses received, will be submitted to the DFFE for approval.

2.6.3 PUBLIC MEETINGS

During the DSR public review period, in-person public meetings were held on the following dates, at the following venues, as detailed in Table 2-11.

Table 2-11 – Scheduled Public Meetings during DSR Public Review Period

Area	Venue	Date	Address
Bantamsklip	Hermanus Municipal Auditorium	07 April 2026	1 Magnolia St, Hermanus, 7200
	NG Kerk Pearly Beach	08 April 2026	20 Main Road, Pearly Beach, 7220
	Gansbaai Tourism Information and Conference Center Hall	09 April 2026	Great White Junction, Main Road, Gansbaai, 7220
Thyspunt	St Francis Bay Golf Club	20 April 2026	556 Lyme Rd, St Francis Bay, 6312
	KwaNomzamo Community Hall	21 April 2026	Mjekula St, Humansdorp, 6300
	Sea Vista Hall	22 April 2026	Geelbek St, St Francis Bay, 6312
	<u>St Francis Bay Golf Club</u>	<u>23 April 2026</u>	<u>556 Lyme Rd, St Francis Bay, 6312</u>
	Oyster Bay Hall	23 April 2026	Oester Ave, Oyster Bay
	Newton Hall	24 April 2026	17 Goedehoop St, C-Place, Jeffreys Bay, 6330
	Coega Vulindlela Conference Centre	11 May 2026	Corner N2 and Addo Rd, Markman, Gqeberha, 6212

Additionally, two virtual public meetings were held on 05 and 06 May 2026. A copy of the presentation and meeting minutes is included in Appendix B-XX of the PPR (Appendix B).

In-person FGMs were also held with key stakeholder groups during the DSR public review period throughout both sites, as detailed in Table 2-12.

Table 2-12 - Focus Group Meetings during DSR Public Review Period

Area	Focus Group	Venue	Date	Address
Bantamsklip	<u>Buffeljagsbaai Community</u>	<u>Buffeljagsbaai Community Hall</u>	<u>08 April 2026</u>	<u>Buffeljagsbaai</u>
	<u>Elim Community</u>	<u>Elim Opsienersraad</u>	<u>09 April 2026</u>	<u>Elim Opsienersraad Offices – Die Werf Square</u>
Thyspunt	<u>Kouga Koisan Council Representatives</u>	<u>Patensie Community Hall</u>	<u>21 April 2026</u>	<u>Pruimboomstreet St, Noorshoek, Patensie</u>

<u>Area</u>	<u>Focus Group</u>	<u>Venue</u>	<u>Date</u>	<u>Address</u>
	<u>Chokka Fishermen Representatives</u>	<u>Newton Hall</u>	<u>24 April 2026</u>	<u>17 Goedehoop St, C-Place, Jeffreys Bay, 6330</u>
	<u>O. B. O. Gamtobaqua Khoisan First Nation Council</u>	-	<u>12 May 2026</u>	<u>3 Vuyo Katoo Street Centerton, Hankey</u>
	<u>Gaokx AibXammi Representatives</u>	-	<u>12 May 2026</u>	<u>244 Tier St (opposite Patensie High School)</u>
	<u>Ecotourism</u>	-	<u>12 May 2026</u>	<u>Humansdorp</u>
	<u>Commercial Squid & Fishers</u>	<u>Kouga LM, St Francis Office</u>	<u>13 May 2026</u>	<u>1 Assisi Dr, St Francis Bay, 6312</u>
	<u>Thyspunt Alliance</u>	<u>Cape St Francis Resort</u>	<u>13 May 2026</u>	-
	<u>Kouga Local Municipality</u>	-	<u>14 May 2026</u>	<u>33 Da Gama Road, Jeffreys Bay</u>
	<u>Nelson Mandela Bay Metropolitan Municipality</u>	<u>Virtual</u>	<u>18 May 2026</u>	<u>Virtual</u>
	<u>Sarah Baartman District Municipality</u>	<u>Virtual</u>	<u>26 May 2026</u>	<u>Virtual</u>
	<u>Chief Stuurman</u>	<u>Boardroom - Bethelsdorp Police Station</u>	<u>27 May 2026</u>	<u>Soudien Rd, Arcadia, Saltville, 6059</u>
	<u>Sea Vista</u>	<u>Sea Vista Hall</u>	<u>27 May 2026</u>	<u>Geelbek St, St Francis Bay, 6312</u>
	<u>St Francis Tourism</u>	<u>Cape St Francis Resort</u>	<u>27 May 2026</u>	-
	<u>St Francis Residents Association</u>	<u>Cape St Francis Resort</u>	<u>28 May 2026</u>	-
	<u>Fishers</u>	<u>Newton Hall</u>	<u>29 May 2026</u>	<u>17 Goedehoop St, C-Place, Jeffreys Bay, 6330</u>

2.6.4 COMMENT AND RESPONSE REPORT

All concerns, comments, viewpoints, and questions (collectively referred to as 'issues') received during the initial notification period, including the initial virtual information sessions, and during the DSR public review period have been documented and responded to adequately in the Comments and Responses Report (CRR) that is attached as Appendix B-5 to the PPR (**Appendix B**). The CRR records the following:

- List of all issues raised;
- Record of who raised the issues;
- Record of where the issues were raised;
- Record of the date on which the issue was raised; and
- Response to the issues.

2.6.5 SUMMARY OF COMMENTS AND RESPONSES - PRE-APPLICATION

This summary reflects stakeholder engagement primarily through the Pre-Application Phase of the S&EIR process undertaken between November 2025 and March 2026 for the proposed NPP. Table 2-13 give breakdown of the 603 substantive comments received to date.

Table 2-13 – Breakdown of the substantive comments received between December 2025 and March 2026

Theme Category	Count	Description
Questions/Inquiries	236	General questions about the project, process, and impacts
I&AP Registration Requests	162	Requests to be registered as Interested & Affected Parties
Meeting Information	80	Requests for meeting links, times, and materials
Socio-Economic Concerns	63	Jobs, employment, tourism, community impacts
Environmental - Marine	44	Concerns about marine life, fishing, whales, sharks, penguins
Alternative Energy Sources	46	Suggestions for renewable energy (solar, wind) instead
Public Participation Process	42	Comments on engagement methods, virtual vs in-person
Opposition to Project	32	Direct objections to the nuclear plant
Cost/Financial Concerns	31	Project costs, funding, taxpayer burden
Transmission Lines	23	Questions about power lines and grid connections
Technology Questions	23	PWR, SMR, technology envelope concerns
Safety/Risk Concerns	19	Nuclear safety, accident risks
Radioactive Waste	17	Waste disposal and management concerns
Support for Project	15	Pro-nuclear comments
Environmental – Terrestrial	14	Flora, fauna, fynbos, biodiversity concerns

The main categories of the comments and the response thereto are summarised in Table 2-14 to Table 2-22, but with more information provided in the various referenced sections of this report as well as a detailed response in the CRR (**Appendix B**).

Table 2-14 – I&AP Registration Requests (December 2025 – March 2026)

Comments to I&AP Registration Requests	Key Summary of Response	Reference in Report
The majority of comments related to requests to be registered as Interested and Affected Parties, submitted by individual residents (including Oyster Bay, St Francis Blay, Pearly Beach and Hermanus), environmental organisations (such as Earthlife Africa, FOSTER, CapeNature and	All registration requests were acknowledged and confirmed, and registered parties were provided with virtual meeting details, including meeting IDs and passwords, for the public engagement sessions held on 01 and 02 December 2025.	Chapter 2; Appendix B – Public Participation Report

Comments to I&AP Registration Requests	Key Summary of Response	Reference in Report
WESSA), government departments (including the Department of Water and Sanitation and the Department of Energy and Electricity), local municipalities (Kouga and Overstrand), as well as conservation trusts and non-governmental organisations.		

Table 2-15 – Public Participation Process

Comments to Public Participation Process	Key Summary of Response	Reference in Report
Comments raised concerns regarding the reliance on virtual meetings, including the exclusion of vulnerable communities without reliable internet access, technical failures of the registration system preventing access to meetings, requests for in person engagement sessions in affected communities, requests for access to meeting recordings and presentation materials, and difficulties experienced when joining meetings (including extended waiting times in virtual lobbies).	In response, meeting recordings and presentation materials were made available following the engagement sessions, technical challenges were acknowledged and addressed by pausing the presentation, and confirmation of Interested and Affected Party registration was provided where applicable. It was further indicated that in-person public meetings will be held during the Scoping and EIA phases.	Chapter 2; Appendix B – Public Participation Report

Table 2-16 – Site Selection

Comments to Site Selection	Key Summary of Response	Reference in Report
Comments questioned why only two sites from the 1980s national nuclear site assessment were taken forward, why the Coega Industrial Development Zone (near Gqeberha) was not considered, and what became of the other candidate sites (Brazil, Schulpfontein and Duynefontyn).	In response, it was confirmed that the 1980s national assessment identified five potential sites. Brazil and Schulpfontein remain not feasible due to their remoteness and distance from the transmission grid, which would prevent timely grid integration. The Duynefontyn site has already been approved for the development of a nuclear power plant. The Coega IDZ was considered during the Nuclear-1 EIA process but was found to be unsuitable due to seismic constraints. Thyspunt is the most advanced candidate site in terms of completed site-specific investigations and progression against the NNR licensing requirements, with Bantamsklip having also undergone studies but at a comparatively earlier stage of readiness for the 2039 Integrated Resource Plan timeframe.	Chapter 6; Chapter 11; Appendix G – Specialist Scoping Studies

Table 2-17 – Environmental Concerns

Comments to Environmental Concerns	Key Summary of Response	Reference in Report
Marine environment comments raised concerns regarding potential impacts on shark breeding areas at Bantamsklip, whale migration routes and Southern Right	In response, it was confirmed that specialist assessments addressing marine ecology (including thermal effects) and fisheries, as well as terrestrial flora, fauna and ecological	Chapter 8; Chapter 10; Chapter 11; Appendix G – Specialist Scoping Studies

Comments to Environmental Concerns	Key Summary of Response	Reference in Report
Whale calving grounds, African penguin populations near Dyer Island, thermal pollution associated with warm water discharge and its effects on marine ecosystems, as well as potential impacts on small-scale and artisanal fishing activities, including the chokka (squid) industry. Terrestrial environment comments related to potential impacts on endemic flower species at Groot Hagekraal, pristine coastal areas, endemic fynbos and strandveld vegetation, proximity to Cape Agulhas National Park, ecologically sensitive dune systems, and critical biodiversity areas.	sensitivities, are being undertaken during the Scoping Phase. Key environmental sensitivities, including those associated with sharks, whales, Dyer Island, kelp forests, sensitive vegetation types and dune systems, have been identified and will be assessed in detail as part of the specialist studies.	

Table 2-18 – Technical and Process Concerns

Comments to Technical and Process	Key Summary of Response	Reference in Report
Comments raised technical and process-related concerns, including the use of a technology envelope approach (PWR versus SMR) without selection of a specific reactor technology, the exclusion of transmission line routing from the current EIA, feasibility of project timelines given potential litigation risks, queries regarding the NNR licensing process, questions on why Coega and other sites were not considered (including reliance on 1980s site selection studies), concerns regarding construction timelines and budget certainty, and the adequacy of the 30-day public comment period.	In response, it was clarified that the technology envelope defines bounding parameters representing a worst-case development scenario that any reactor technology must meet, allowing assessment of the maximum potential impacts. Transmission lines are being progressed separately by the National Transmission Company of South Africa (NTCSA) and will be subject to a separate EIA process. The target date for completion of the current environmental authorisation process is mid 2027. Legislative timeframes applied during this process are aligned with the EIA Guidelines (2014), which prescribe statutory public participation and authority review periods that were not legislated at the time of the Nuclear-1 EIA.	Chapter 2; Chapter 11; Appendix B – Public Participation Report; Appendix G – Specialist Scoping Studies; Appendix J – Pre-Application Meeting Minutes

Table 2-19 – Financial and Economic Concerns

Comments to Financial and Economics	Key Summary of Response	Reference in Report
Comments raised financial and economic concerns relating to overall project cost estimates and funding sources, comparisons with the costs of renewable energy alternatives, the economic viability of the project given extended construction timelines, and Eskom's historical delivery performance, including references to Medupi.	In response, it was clarified that Eskom has not yet initiated a formal procurement process for the proposed NPP and, as such, detailed cost and funding information is not yet available. An Economic Impact Assessment will be undertaken during the EIA Phase, which will assess the relevant phases (including construction-phase impacts) on businesses, employment and household income, as well as the broader macro-economic implications of the project.	Chapter 8; Chapter 10; Chapter 11; Appendix G – Specialist Scoping Studies

Table 2-20 – Socio-Economic Concerns

Comments to Socio-Economics	Key Summary of Response	Reference in Report
Comments raised socio-economic concerns relating to potential impacts on the tourism sector (including whale watching, shark cage diving and birding), opportunities for local employment and skills transfer, accommodation requirements for a large construction workforce, potential impacts on property values, prolonged community disruption during the anticipated construction period, the influx of job seekers and associated social tensions, impacts on local businesses, and youth employment opportunities.	In response, it was confirmed that a Social Impact Assessment, Economic Impact Assessment and Tourism Assessment will be undertaken during the EIA Phase, covering construction, operational and, where applicable, decommissioning phases	Chapter 8; Chapter 10; Chapter 11; Appendix G – Specialist Scoping Studies

Table 2-21 – Energy Alternative Concerns

Comments to Energy Alternatives	Key Summary of Response	Reference in Report
Comments proposed alternative energy options, including renewable energy technologies such as solar, wind and battery storage, as well as hydrogen-based power generation, and requested cost comparisons between nuclear and renewable energy options. Questions were also raised regarding the rationale for pursuing nuclear power instead of green alternatives.	In response, it was clarified that the Integrated Resource Plan (2025 IRP) requires a diversified energy mix, recognising that nuclear and renewable energy sources are complementary rather than competing. Nuclear power provides stable, reliable baseload electricity that intermittent renewable sources cannot deliver on their own. Nuclear energy is recognised as a low-carbon energy source aligned with the Climate Change Act, particularly in the context of the planned decommissioning of approximately 15 GW of coal-fired generation between 2034 and 2042. South Africa has limited hydro resources (only two hydropower plants at ~300 MW each). Three pump storage sites exist, with another EIA completed for Steelpoort. Pump storage is considered for storing surplus renewable power but cannot replace baseload capacity. Detailed cost information is not yet available and will only be established once Eskom issues a formal Request for Proposals (RFP). Economic viability will be assessed during the EIA Phase through Cost-Benefit Analysis and Macroeconomic Impact studies.	Chapter 6; Chapter 11

Table 2-22 – Nuclear Specific Concerns

Comments to Nuclear	Key Summary of Response	Reference in Report
Comments raised nuclear-specific concerns relating to radioactive waste management (including disposal at the Vaalputs facility), nuclear safety and accident risks, long-term liability associated with radioactive waste, comparisons with	In response, it was confirmed that Vaalputs, located in the Northern Cape, is South Africa's designated facility for the disposal of low- and intermediate-level radioactive waste, with high-level waste stored on a long-term basis in relatively low volumes at	Chapter 3; Chapter 4; Chapter 5; Chapter 6; Chapter 11; Appendix G – Specialist Scoping Studies

Comments to Nuclear	Key Summary of Response	Reference in Report
international nuclear projects, and decommissioning considerations.	the nuclear power plant. South Africa's National Policy and Strategy for the Management of Radioactive Waste (2005) provides the overarching framework for radioactive waste management. A high-level radioactive waste disposal programme has not yet been implemented in South Africa, and the EIA will include an overview of international programmes and best practices. Nuclear safety is regulated through the NNR licensing process, which runs in parallel with the EIA and requires multiple specialist studies to inform decision-making. Radioactive waste disposal impacts, including long-term considerations, will be assessed in the EIA, together with qualitative descriptions of disposal routes for different waste categories where appropriate. A radioactive waste transport study will be undertaken to assess potential impacts and mitigation measures, with all transport activities required to comply with NNR safety standards aligned with IAEA requirements. The scope of assessment also includes radioactive waste generated during decommissioning and how it will be managed, with decommissioning-related socio-economic aspects, including costs and timelines. References to French nuclear plants near populated/tourist areas were made. These facilities offer educational tours and visitor centres demonstrating safe coexistence with communities. Post-Fukushima regulatory changes are acknowledged but detailed responses are still pending.	

2.6.6 SUMMARY OF COMMENTS AND RESPONSES – SCOPING PHASE

This summary reflects stakeholder engagement during the public review of the DSR undertaken between 1 April and 29 May 2026 for the proposed NPP. Table 2-23 give breakdown of the 3500 substantive comments received to date.

Table 2-23 – Breakdown of the substantive comments received between April to May 2026

Theme Category	Estimated Prevalence	Description	Reference In Report
Public Participation Process	Very High	I&AP registration requests, meeting logistics (virtual and in-person), comment period adequacy, document volume and accessibility, language accessibility (Afrikaans, isiXhosa, English), recording and distribution of meetings, notification procedures, and adequacy of engagement with fishing communities and indigenous groups. This is the highest-volume	Section 2.6 PPR (Appendix B)

<u>Theme Category</u>	<u>Estimated Prevalence</u>	<u>Description</u>	<u>Reference In Report</u>
		category, comprising the majority of early comments (Nov 2025 – Mar 2026).	
<u>EAP Independence & Conflict of Interest</u>	High	Concerns regarding WSP's corporate association with the global nuclear industry, perceived structural bias, formal declarations of independence, EAPASA registration requirements, the SARFU reasonable apprehension of bias test, procurement of specialists by the EAP, and requests for fully independent EAPs and peer reviewers nominated by DFFE.	<u>Section 1.5.4</u>
<u>Need & Desirability / Energy Alternatives</u>	High	Challenges to the justification for nuclear power under the IRP 2025, requests for lifecycle cost assessments (LCOE), comparisons with renewables-plus-storage alternatives, cost transparency, the relationship between Nuclear-1 and Nuclear-2 capacity allocations, and requests for Strategic Environmental Assessments (SEAs).	<u>Section 3</u> <u>Section 5</u> <u>Section 6</u>
<u>Site Selection & Alternatives</u>	High	Objections to the identification of Thyspunt as the preferred site, requests to retain Bantamsklip for comparative EIA-phase assessment, requests for brownfield site consideration, and premature scoping-out of alternatives before full comparative assessment.	<u>Section 6</u> <u>Section 11</u>
<u>Cultural Heritage</u>	High	Thyspunt provisional Grade I Cultural Landscape protection (NHRA s29), SAHRA 2016 no-go recommendation, heritage specialist findings that the site "cannot be supported" from a cultural landscape perspective, NHRA s38(8) requirements, Khoisan and indigenous heritage, and archaeological/palaeontological sensitivity.	<u>Section 8.3.3</u> <u>Section 10.4.16 and 10.5.9</u> <u>Section 11.3.16 and 11.6.17</u> <u>Appendix G.16</u>
<u>Marine Ecology & Fisheries</u>	High	Chokka squid (<i>Loligo reynaudii</i>) spawning grounds, fishery exclusion zone impacts (rated "High, no practical mitigation"), sediment plume modelling, thermal discharge, dredging and spoil disposal, larval entrainment, benthic habitat, cumulative fisheries-economic consequences, and inconsistencies between marine ecology and socio-economic impact ratings.	<u>Section 8.2.7</u> <u>Section 10.4.13 and 10.5.7</u> <u>Section 11.3.13 and 11.6.12</u> <u>Appendix G.16</u>
<u>Nuclear Safety & Radiological Risk</u>	Moderate–High	Low-probability/high-consequence risk profile, emergency preparedness and	<u>Section 3</u>

<u>Theme Category</u>	<u>Estimated Prevalence</u>	<u>Description</u>	<u>Reference In Report</u>
		evacuation planning, Fukushima precedent, baseline and long-term radiation monitoring, security threats (sabotage, aircraft, drones, cybersecurity), natural disaster interaction, risk perception effects on wellbeing, and requests for transparent, independent oversight.	Section 8.1.9 Section 10.4.22 Section 11.3.22 and 11.6.24 Appendix G.21
<u>Governance & Institutional Capacity</u>	<u>Moderate–High</u>	Eskom's financial capacity and infrastructure maintenance record, long-term institutional sustainability, Earthlife Africa v Minister of Energy (2017) judgment, State Capture Commission findings, procurement governance (PFMA), multi-generational public responsibility, NNR regulatory independence, and public confidence concerns.	Appendix F of the PPR (Appendix B)
<u>Socio-Economic Impacts</u>	<u>Moderate–High</u>	Impacts on tourism, property values, investment, fishing, and agriculture in the St Francis Bay and Kouga regions; risk perception effects on regional economy; local employment and procurement expectations; skills gap analysis; construction workforce impacts; and requests for independent economic modelling.	Section 8.3.1 Section 10.4.15 and 10.5.8 Section 11.3.15, 11.6.14, 11.6.15 and 11.6.16 Appendix G.14
<u>Project Splitting / Cumulative Impacts</u>	<u>Moderate</u>	Concerns that transmission corridors, construction villages, access roads, water supply and other associated infrastructure are excluded from the current EIA (unlawful "project splitting"), project boundary too narrow for cumulative assessment, NEMA s2(4)(vii) compliance, and requests for integrated single EIA or SEA.	Section 4 Section 10.5, 10.6 and 10.8
<u>Radioactive Waste Management</u>	<u>Moderate</u>	Spent fuel storage, radioactive waste transport, long-term waste stewardship, decommissioning obligations, Radioactive Waste Management Policy, and NNR licensing requirements for waste management provisions.	Section 10.4.23 Section 11.6.23 Appendix G.22
<u>Coastal Resilience & Geotechnical Stability</u>	<u>Moderate</u>	Shoreline change modelling, sediment transport, erosion projections, climate change scenarios, groundwater behaviour, subsurface structural analysis, palaeovalleys, post-Fukushima coastal safety requirements, and integration of existing geological research (e.g. Claassen & De Wit findings).	Section 8.1.8 Section 10.4.6 and 10.5.3 Section 11.3.6 and 11.6.6 Appendix G.13

<u>Theme Category</u>	<u>Estimated Prevalence</u>	<u>Description</u>	<u>Reference In Report</u>
<u>Terrestrial Biodiversity & Ecology</u>	<u>Moderate</u>	<u>Critical Biodiversity Areas (CBAs), mobile dune ecosystems, NEMBA and National Biodiversity Framework compliance, conservation corridors, faunal and floral impacts, and requests for permanent conservation of candidate sites.</u>	<u>Section 8.2</u> <u>Section 10.4.9, 10.4.10, 10.4.11, 10.4.12, 10.4.13, and 10.4.14</u> <u>Section 10.5.4, 10.5.5, 10.5.6, and 10.5.7</u> <u>Section 11.3.9, 11.3.10, 11.3.11, 11.3.12, 11.3.13, and 11.3.14</u> <u>Section 11.6.9, 11.6.10, 11.6.11, 11.6.12, and 11.6.13</u> <u>Appendix G.7</u> <u>Appendix G.8</u> <u>Appendix G.9</u> <u>Appendix G.10</u> <u>Appendix G.11</u> <u>Appendix G.12</u>
<u>Climate Change</u>	<u>Moderate</u>	<u>GHG lifecycle emissions, avoided emissions methodology, carbon accounting, desalination parasitic energy demand, storm surge/wave climate/compound flood modelling, and climate vulnerability of coastal infrastructure.</u>	<u>Section 8.1.12</u> <u>Section 10.4.21 and 10.5.11</u> <u>Section 11.3.21 and 11.6.22</u> <u>Appendix G.23</u>
<u>General Objections / Support</u>	<u>Moderate</u>	<u>General objections to nuclear power at Thyspunt and/or Bantamskip, general expressions of support for nuclear energy, constitutional rights concerns, and requests for refusal of environmental authorisation.</u>	<u>Appendix F of the PPR (Appendix B)</u>
<u>Transmission Integration</u>	<u>Low–Moderate</u>	<u>Exclusion of high-voltage transmission corridors from the current EIA, separate NTCSA authorisation process, transmission integration planning for both sites, and cumulative visual and ecological impacts of powerline routes.</u>	<u>Section 4</u> <u>Section 6</u>
<u>Traffic & Transportation</u>	<u>Low–Moderate</u>	<u>Road infrastructure capacity for abnormal heavy vehicle loads, construction traffic impacts, regional road upgrades, and biosecurity risks associated with workforce and vehicle movement.</u>	<u>Section 8.3.6</u> <u>Section 10.4.24 and 10.5.12</u> <u>Section 11.3.23 and 11.6.25</u> <u>Appendix G.20</u>

<u>Theme Category</u>	<u>Estimated Prevalence</u>	<u>Description</u>	<u>Reference In Report</u>
<u>Agricultural Potential</u>	<u>Low–Moderate</u>	<u>Impacts on irrigated pastures, FMD and biosecurity risks, agricultural land loss, and food security considerations.</u>	<u>Section 8.1.2</u> <u>Section 10.4.8</u> <u>Section 11.3.7 and 11.6.7</u> <u>Appendix G.17</u>
<u>Air Quality</u>	<u>Low</u>	<u>Potential air quality impacts during construction and operation phases.</u>	<u>Section 8.1.10</u> <u>Section 10.4.1 and 10.5.1</u> <u>Section 11.3.1 and 11.6.1</u> <u>Appendix G.6</u>

The main categories of the comments and the response thereto are summarised in Table 2-24, more information is provided in the various referenced sections of this report as well as a detailed response in the CRR (**Appendix B**).

Table 2-24 – Breakdown of the substantive comments received between April to May 2026

<u>Main Category</u>	<u>Detailed Nature of Comments Raised</u>	<u>Typical Response Approach In CRR</u>	
<u>Public Participation Process</u>	<u>High volume of administrative and access-related issues including: I&AP registration requests, requests for confirmation of registration, failure to receive notifications; difficulty accessing or joining Microsoft Teams meetings; concerns regarding exclusion of digitally disadvantaged stakeholders; requests for audit trails and proof of participation; perception that PPP was not sufficiently inclusive or representative</u>	<u>Administrative confirmation of registration and inclusion on stakeholder database; provision or re-sharing of meeting links and RSVP instructions; clarification that notifications were issued using available contact details; explanation of steps taken to resolve technical issues (e.g. pausing meetings, re-sharing links); assurance that all stakeholders will receive future notifications and that participation remains open via email and formal comment channels</u>	<u>Section 2.6</u> <u>PPR (Appendix B)</u>

<u>Main Category</u>	<u>Detailed Nature of Comments Raised</u>	<u>Typical Response Approach In CRR</u>	
<u>EIA Process / Procedural Issues</u>	Concerns regarding adequacy and defensibility of the EIA process, including: compressed timelines; lack of opportunity for meaningful engagement; perceived procedural unfairness; likelihood of legal challenges; limitations of the scoping phase (e.g. absence of detailed specialist studies); requests for extension of comment periods; concerns about independence of process.	Responses emphasize regulatory compliance with NEMA EIA Regulations and prescribed timeframes; clarification that scoping and EIA phases have distinct objectives; acknowledgment of constraints (e.g. no formal extension for scoping phase); indication that extensions may be requested for EIA phase; reassurance that all comments are captured and addressed in CRR; emphasis on transparency and structured multi-phase process.	Section 2
<u>Project Description / Scope</u>	Requests for clarity on project components and boundaries, including: what infrastructure is included/excluded (e.g. transmission lines); how the “technology envelope” approach works; concern that technology is undefined; questions on scale, phasing, and operational parameters; concern that impacts cannot be assessed without a specific design.	Responses clarify that the EIA assesses a worst-case “envelope” of parameters; explanation that transmission infrastructure will be assessed separately under a different applicant and EIA process; confirmation that specialist assessments are based on maximum design assumptions; reassurance that detailed design will follow within approved envelope conditions.	Section 4
<u>Alternatives (Site and Technology)</u>	Strong objections to limited site alternatives, including: perception that only two sites are being “forced”; requests to reconsider previously excluded alternatives (e.g. Coega); concern that historic (1970s–1980s) screening is outdated; concerns regarding lack of renewable or other energy alternatives; calls for broader spatial and technological assessment.	Responses reference prior national siting studies and IAEA-guided processes; explanation that current sites are most advanced and aligned with IRP timelines; justification for exclusion of certain sites (e.g. seismic constraints); confirmation that alternatives assessment (site, technology, and no-go) will be detailed in Scoping and EIA Reports; reiteration of IRP-aligned energy mix approach.	Section 3 Section 4 Section 6 Section 11

<u>Main Category</u>	<u>Detailed Nature of Comments Raised</u>	<u>Typical Response Approach In CRR</u>	
<u>Project Need and Desirability</u>	Criticism of the rationale for nuclear power, including: affordability concerns; long lead times; perceived obsolescence given renewable advancements; questioning “baseload” justification; concerns about debt burden and opportunity costs (public spending priorities); requests for updated demand modelling.	Responses consistently reference the Integrated Resource Plan (IRP) and national energy policy; explanation that nuclear forms part of a diversified energy mix; justification based on stable baseload supply and energy security; acknowledgment that costing, funding models, and demand considerations are still under investigation.	Section 5
<u>Socio-economic Impacts</u>	Concerns about local and regional socio-economic impacts, including: pressure on municipal infrastructure (water, electricity, housing, health, schools); in-migration of workers; boom-bust effects post-construction; tourism impacts; affordability and economic feasibility of the project; lack of financial transparency.	Responses indicate that specialist studies (SIA and economic assessments) will quantify impacts for both construction and operational phases; explanation that modelling includes employment, income, and business impacts; acknowledgment that construction impacts are significant but temporary; confirmation that funding and cost analysis is ongoing.	Section 8.3.1 Section 10.4.15 and 10.5.8 Section 11.3.15, 11.6.14, 11.6.15 and 11.6.16 Appendix G.14
<u>Environmental Impacts (General)</u>	Broad environmental objections, including: biodiversity loss; disturbance of sensitive coastal ecosystems; cumulative impacts (construction spoil, infrastructure); visual and landscape transformation; ecological sensitivity of sites.	Responses confirm that impacts will be assessed through multiple specialist studies; emphasis on identification of impact significance and mitigation measures; assurance that findings will be documented in Scoping and EIA Reports and inform decision-making.	Section 10
<u>Marine Biology / Ocean Impacts</u>	Detailed marine-specific concerns, including: thermal discharge impacts from cooling water; impacts on fisheries (e.g. squid); spoil disposal in marine environment; impacts on sharks and marine biodiversity; alteration of coastal processes.	Responses confirm that marine ecology and fisheries studies will assess thermal plumes, habitat disturbance, and species impacts; acknowledgement of sensitivity of marine environment; indication that mitigation and monitoring measures will be defined in specialist reports.	Section 8.2.7 Section 10.4.13 and 10.5.7 Section 11.3.13 and 11.6.12 Appendix G.16

<u>Main Category</u>	<u>Detailed Nature of Comments Raised</u>	<u>Typical Response Approach In CRR</u>	
<u>Geotechnical / Seismic / Climate Risks</u>	Concerns regarding: geological stability; seismic risk; historical adequacy of site investigations; impact of climate change (sea-level rise, extreme events); suitability of coastal siting	Responses indicate that previous studies will be updated and validated; confirmation that new geotechnical, seismic, and climate change assessments will be undertaken; assurance that these findings will inform site suitability evaluation	Section 8.1.1, 8.1.3 and 8.1.4 Section 10.4.7 Section 11.3.8 and 11.6.8 Appendix G.2
<u>Infrastructure & Associated Development</u>	Concerns regarding supporting infrastructure being excluded or deferred, including: transmission lines, grid integration, bulk services; cumulative and indirect impacts; concern that project is being “segmented”	Responses clarify that transmission infrastructure is the responsibility of NTCSA and will undergo a separate EIA; explanation that interdependencies are recognised in planning; indication that corridors and cumulative considerations will be addressed at appropriate level	Section 4 Section 6
<u>Information Access & Transparency</u>	Requests for improved access to information, including: copies of presentations and recordings; specialist reports; registration confirmation; submission mechanisms; comment deadlines; transparency on data and decisions	Responses provide links, contact details, and assurances that materials (recordings, presentations) will be distributed; confirmation that comments can be submitted via multiple channels; reiteration that all submissions are captured in CRR and considered in decision-making	PPR (Appendix B)
<u>General / Opinion Statements</u>	Non-technical comments, including: strong objections or support; statements on Eskom’s performance or governance; broader political or ideological views; commentary not requiring technical response	Typically acknowledged or “noted” without detailed response unless clarification is necessary; where relevant, responses redirect to appropriate specialist studies or policy frameworks	PPR (Appendix B)

2.6.7 WAY FORWARD

On-going Consultation and Engagement

In addition to the public documents distributed to stakeholders, there will be on-going communication between the proponent, the EAP and stakeholders throughout the S&EIR process. These interactions will include the following:

- Interactions with stakeholders will take place in English, Afrikaans and Xhosa;
- Feedback to stakeholders, individually and collectively;
- Written responses (email, faxes or letters) will be provided to stakeholders acknowledging issues and providing information requested (dependent on availability); and

- As per the GNR 982, as amended, particular attention will be paid to landowners, and neighbouring communities, specifically where literacy levels and language barriers may be an issue.

Final Scoping Report Submission

All issues raised during the scoping phase of the proposed project has been incorporated into the FSR and will be addressed during the EIR Phase.

The DFFE has 43 days to review the FSR once submitted. This FSR will be placed on stakeholder review during the DFFE's final review and decision-making process. The delegated CA must within this specified timeframe issue a decision on whether to proceed onto the next phase, the EIR phase.

2.7 ASSUMPTIONS AND LIMITATIONS

General assumptions and limitations:

- The EAP hereby confirms that they have undertaken to obtain project information from the client that is deemed to be accurate and representative of the project;
- Site visits have been undertaken to better understand the project and ensure that the information provided by the client is correct, based on site conditions observed;
- The EAP hereby confirms their independence and understands the responsibility they hold in ensuring all comments received are accurately replicated and responded to within the EIA documentation;
- The comments received in response to the public participation process, will be representative of comments from the broader community; and
- Based on the pre-application meeting and subsequent minutes, the CA would not require additional specialist input, in order to make a decision regarding the application.

Dune Geomorphology Scoping Study:

- Information required for this report is sufficiently complete at Bantamsklip.
- The following limitations are relevant to the Thyspunt site:
- The geohydrological investigation undertaken for the EIA was focused on the NPP site itself, with only two boreholes drilled within the mobile Oyster Bay dunefield; and
- The hydrological investigation undertaken for the EIA focused on the NPP site itself, with no investigation of the mobile Oyster Bay dunefield.
- These limitations have not seriously compromised this investigation, as field observations and aerial photo interpretation has provided sufficient information to achieve a moderate to high degree of confidence in the results of the investigation and deductions made.

Geotechnical Scoping Study:

- Conditions may exist which were undetectable given the limited nature of the enquiry WSP was retained to undertake with respect to the site. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the report. Accordingly, additional studies and actions may be required.
- In addition, it is recognised that the passage of time affects the information and assessment provided in this report. WSP's opinions are based upon information that existed at the time of the production of the report. It is understood that the Services provided allowed WSP to form no more

than an opinion of the actual conditions of the site at the time the site was visited and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

- Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by WSP for incomplete or inaccurate data supplied by others.

Hydrology Scoping Study:

- This Scoping Report has been based on a desk study of available information, which included a reconnaissance visit to each site, surface water modelling and impact assessments during the previous EIRs and SSRs, for the two sites. The Thyspunt site information has been updated to 2025 with the latest data whereas the Bantamsklip site data were last updated in 2014. However, this site had been sufficiently characterised up to that date to enable compilation of this Scoping Report. The previous hydrological studies relied on meteorology, oceanography and coastal engineering, geohydrology and water supply sections.
- A component of this study is the collection of local and regional data. A problem generally encountered in South Africa is the lack of long-term meteorological and surface runoff data. In view of this, all existing and appropriate short and long-term data was collected. Extrapolation of the data was done using standard statistical methods (Annual Maximum Series (AMS) for various probability distributions) to predict longer term occurrences. Professional judgement is therefore necessary to ensure that realistic values are carried forward during the assessment.
- The catchments impacting the site has been considered for Thyspunt and Bantamsklip to adequately cover local and regional surface runoff including the hydrological features. These areas may be modified as more information becomes available.

Freshwater Supply Scoping Study:

This Scoping Report has been based on a desk study, a reconnaissance visit to each site by SRK and detailed site investigations, monitoring and data analysis between 2008 and 2025 by SRK. The Thyspunt site dataset was updated for the TSSR Rev 1 completed in early 2025. Although the Bantamsklip dataset only includes data between 2008 and 2014, this is considered to be adequate for the purposes of this Scoping Report.

Assumptions

- Provisional potable water requirements for a NPP, based on units of a 5 200 MWe, are estimated to be (WSP, 2026):
 - Site establishment: 70.72 L/s;
 - Early construction: 91.64 L/s;
 - Construction peak: 94.94 L/s;
 - Operation: 30.39 L/s.
- Demineralised water is required for e.g. boiler feed comprising an additional 49.96 L/s, during the operation phase. Housing of temporary and permanent staff will be established and the required amounts for these staff vary from 46 L/s initially to 12 L/s permanently. It is assumed that this water will be sourced from the local municipal supply (Eskom, 2008).

- The following temporary reservoirs will need to be established on the site (Eskom, 2026) for the excavation and construction phases (subject to further confirmation):
 - Seawater reservoir (pre-desalination): 1 x 9 000 m³;
 - Desalinated construction water (two days standby): 2 x 9 000 m³.
- The following permanent reservoirs will be required for the operational phase (subject to further confirmation):
 - Demineralised water: 2 x 800 m³ and 4 x 2 200 m³;
 - Seawater reservoir (pre-desalination): 1 x 9 000 m³;
 - Potable water: 2 x 9 000 m³;
 - Fire water: 2 x 1 800 m³.
- Options for fresh water supply to both sites include:
 - Surface water from existing dams/pipeline or construction of a new supply dam(s);
 - Groundwater;
 - Treated waste water;
 - Buying out of existing water use licenses;
 - Storm water run-off from the site (source Hydrology study);
 - Desalination of seawater, which is Eskom's preferred option at both sites.
- Seawater desalination plants (reverse osmosis) will be used for the main water supply to the sites and will be deployed in phases during the lifecycle of the project, typically as follows (WSP, 2026):
 - Early construction: Pilot plants with beach wells;
 - Main construction phase: Permanent desalination systems housed in a permanent building with seawater intake from beach wells;
 - Operational phase: Intake of seawater via the NPP cooling water intake and discharge of brine via the NPP cooling water outfall.
- All desalination plant infrastructure will be located within the enveloping footprint area shown in Drawing 7-1 and 7-2 of the Freshwater Supply Study, for Thyspunt and Bantamsklip, respectively.
- The intake water has is assumed to have a salinity or total dissolved solids (TDS) of c.35 000 mg/L. The resultant brine from the desalination process will have a TDS of c.65 000 mg/L (WSP, 2026).
- The seawater requirements and brine discharge for potable water supply throughout the main stages of the NPP lifecycle, assuming a conservative 40% potable water recovery, would be approximately:
 - Site establishment: 176.80 L/s input and 106.08 L/s of brine;
 - Peak construction: 237.35 L/s input and 142.41 L/s of brine;
 - Operation: 75.97 L/s input and 45.58 L/s of brine;
 - Operation: demineralised water requirement will be 49.96 L/s. The volume of brine is unknown at this stage.
- During excavation and construction, a number of discharge options exist (Eskom, 2010a):

- Through a pipe located on the upper beach profile;
 - From a pipe located in the surf zone at a depth of 5 m;
 - From a pipe located beyond the surf zone at a depth of 10 m.
- During operation the brine will be mixed with the very large volumes of cooling water discharged from the NPP, c.72 000 L/s per unit (Eskom, 2025) to minimise such impacts. Mixing of this water with the brine will result in a TDS of c.45 532 mg/L of the total discharge water.

Limitations

- The preliminary specialist reports, undertaken during the Scoping phase of the S&EIR process, were based primarily on desktop investigations and limited field investigations in accordance with the requirements for scoping as stipulated in the EIA Regulations. It must be emphasised that the detailed specialist investigations will take place during the detailed assessment phase of the EIA process and the results thereof will form part of the EIA Report.
- Detailed information in terms of associated infrastructure such as roads, harbours and transmission lines required for the operation of the NPP as well as the integration of the generated power into the network will be further assessed in the EIA phase.

Geohydrology Scoping Study:

- This Geohydrological Scoping Report has been based on a desk study of available information, a reconnaissance visits to each site, detailed site work in the form of surface geophysics, drilling of exploration boreholes, yield testing and numerical groundwater flow modelling. The Thyspunt site information has been updated to 2025 with the latest groundwater monitoring data whereas the Bantamsklip site data were last updated in 2014. However, this site had been sufficiently characterised up to that date to enable compilation of this Scoping Report. A list of references sourced for the study is given in Section 12 of the report.
- Geohydrology is an inexact science in that very few of the key parameters required to define and quantify aquifers can actually be measured. These are water levels; borehole yields and electrical conductivity (EC) and pH. All other parameters, such as hydraulic conductivity (K), transmissivity (T), storage (S) and recharge can only be determined by indirect means. Professional judgement is therefore very important, along with 'sanity checks' to ensure that realistic values are carried forward into e.g. numerical flow modelling.
- A study area of 20 km radius has been taken for Thyspunt and Bantamsklip to adequately cover local and regional aquifers and other geohydrological features. These area limits may be modified as more information becomes available.

Aquatic Ecosystems Scoping Study:

The outputs of this study are subject to the following limitations:

- No new biophysical or water quality data were collected as part of this study, with site visits to both sites being intended to refamiliarise the specialist with the sites and to identify whether there have been significant changes in wetland condition or in the general landscape within and abutting the sites since previous site engagements. Since both sites have been extensively studied from an aquatic ecosystems' perspective, this is not considered a serious limitation of this study.
- The above comments notwithstanding, both sites are large and include extensive wetlands. These have not been delineated in detail on the ground, with mapping of wetland extent being

primarily carried out using aerial photography, supplemented with ground-truthing in areas. In some areas, alien vegetation and/or dense to impenetrable indigenous vegetation making accessing of wetland margins unfeasible in some areas. This means that while the mapped wetland extent presented here is broadly accurate, it is not accurate to the nearest meter. The delineations provided are however considered adequate for the purposes of this EIA, particularly since broad wetland setback are allowed for, in part to allow for delineation inaccuracies as well as to allow for expansion of wetland areas in wetter conditions or with alien plant clearing.

- Wetlands mapped in the Thyspunt dunefields should be seen as indicative layers only, since their positions change over time, as the dunes migrate. Some of the smaller, higher-lying wetlands also dry out and may disappear completely during drier cycles when the water table is no longer exposed in these areas.
- The Scope of Study is confined to proposed activities on the two sites. However, other aspects of the development could well have major indirect impacts on aquatic ecosystems, which are not considered directly in this assessment but could add to the cumulative impacts of the project. These include:
 - Impacts associated with transmission line corridors to either site;
 - Indirect impacts associated with locally increased populations in the broader areas, with accommodation and servicing (water and sanitation) requirements likely to increase for both construction and operational phase workforces, as well as for jobseekers;
 - Impacts associated with the construction of security fences around the broader sites.

Uncertainties at the time of this report comprised:

- The detailed design of the proposed western access route to the Thyspunt site, and how the road design would deal with a dynamic dune system;
- Details as to the proposed fencing of both sites;
- The treatment mechanism for sewage generated on-site and the disposal of treated effluent in particular;
- The indirect impacts likely to be associated with transmission corridors from both sites'
- Climate change impacts – the impacts of climate change based on updated climate change models will be assessed in the EIA phase of this project, as the findings of that specialist study become available.

An important assumption of this Scoping Phase report is that its findings are subject to change, on the basis of more detailed information, particularly regarding the design of various development components – particularly the proposed access road to the Thyspunt site.

Terrestrial Biodiversity Scoping Study:

The following assumptions, limitations, uncertainties are listed regarding the assessment of the site:

- The terrestrial biodiversity field surveys undertaken as part of the scoping phase were limited in spatial and temporal extent and are therefore intended to provide a high-level baseline and sensitivity screening, rather than a comprehensive assessment of all species potentially occurring within the study area.
- The assessment is based on the site visits as well as desktop studies of the available information. The time spent on the sites was adequate for understanding general habitat patterns across the study area and locating as many Species of Conservation Concern as possible.

- Recent large-scale fire events within and adjacent to the study area of Bantamsklip may have temporarily altered habitat structure and species visibility, thereby limiting species recording during the scoping-phase surveys.
- Final survey effort, seasonal coverage, and species-specific investigations will be refined and expanded during the EIA phase, once the detailed project footprint and assessment requirements have been confirmed.

Terrestrial Flora Scoping Study:

The following assumptions, limitations, uncertainties are listed regarding the assessment of the site:

- The assessment is based on the site visits as well as a desktop studies of the available information. The time spent on the sites was adequate for understanding general vegetation patterns across the study area and locating as many species of conservation concern as possible.
- Rare and threatened plant species can be easily missed. This is partially overcome by undertaking desktop research of possible species of concern. The Screening Tool output contains modelled distributions of all species that could occur on site, based on current knowledge of all SANBI databases.
- The field surveys undertaken as part of the scoping phase were limited in spatial and temporal extent and are therefore intended to provide a high-level baseline and sensitivity screening, rather than a comprehensive assessment of all species potentially occurring within the study area.
- Recent large-scale fire events within and adjacent to the study area of Bantamsklip may have temporarily altered habitat structure and species visibility, thereby limiting species recording during the scoping-phase surveys.
- Final survey effort, seasonal coverage, and species-specific investigations will be refined and expanded during the EIA phase, once the detailed project footprint and assessment requirements have been confirmed.

Avifauna Scoping Study:

The following assumptions and limitations are applicable for this assessment:

- It is assumed that all information received from the client/developer is accurate;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The assessment area (PAOI) was based on the project areas as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- The area was only surveyed during a single site visit (dry season) and therefore, this assessment does not consider temporal trends (note that the data collected is considered sufficient to derive a meaningful baseline);
- This report is limited to a scoping and site sensitivity verification level in accordance with South African EIA regulations; it is not a comprehensive EIA specialist study. Additional impacts and mitigation measures may be identified and assessed in detail during the full EIA phase, and the findings herein are preliminary and subject to revision;
- Whilst every effort was made to cover as much of the PAOI as possible, some plant and animal species that are present within the PAOI may not have been recorded during the field

investigations. However, it is the opinion of the specialist that an accurate representative sample of the ecological components considered within this assessment was collected; and

- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.

Terrestrial Invertebrate and Fauna Scoping Study:

The following assumptions and limitations are applicable for this assessment:

- It is assumed that all information received from the client/developer is accurate;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The assessment area (PAOI) was based on the project areas as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment.
- This assessment does not consider temporal trends (note that the data collected is, however, considered sufficient to derive a meaningful baseline);
- This assessment includes vertebrate non-volant terrestrial mammals, herpetofauna and invertebrates only;
- The area was only surveyed during a single site visit (wet season) and therefore, this assessment does not consider temporal trends (note that the data collected, as well as the available previous vertebrate data (Harrison et al., 2011), is considered sufficient to derive a meaningful baseline);
- Whilst every effort was made to cover as much of the PAOI as possible, it is possible that some plant and animal species that are present within the PAOI were not recorded during the field investigations. However, it is the opinion of the specialist that an accurate representative sample of the ecological components considered within this assessment was collected; and
- The GPS used in the assessment has an accuracy of 5 m and consequently, any spatial features may be offset by up to 5 m.

Marine Biology Scoping Study:

- The study is based on details provided by WSP as they pertain to planned infrastructures design, proposed activities and sites, etc. The accuracy and confidence of this study is dependent on the data available for the marine and coastal environments of the East Coast and the Port itself.
- The accuracy and confidence of this study is dependent on the data available for the marine and coastal environments of the south coast and the sites of interest. No additional in situ data collection was undertaken for this project; instead, the site visit served as a high-level confirmation of site sensitivity (although some incidental information on the sites were collected by the specialists).
- Confidence in such assessment is based on a combination of the quality, quantity and period of time spanned by the available data, as well as the knowledge and experience of the specialists. This is a subjective measure, as some specialists may be inherently more confident than others. Therefore, DWA (2012) provides a useful guideline for assessing confidence. As there are good, up to date data available for the system, confidence in this assessment is 'high'.

Marine Physical, Water Quality, Sediment Transport and Shoreline Change Scoping Study:

A reactor technology has not been selected yet and will not be selected as part of this EIA process. The EIA will be technology neutral and use a plant parameter envelope (PPE) approach (ESKOM, 2025b), meaning it will use parameters from multiple reactor technologies and provide an

assessment of the likely effects of a new NPP by forming a bounding case. This means that none of the individual reactor designs would have a greater impact on the environment, socio-economic conditions or human health than what is included in the PPE and assessed in the EIA. This approach provides flexibility for the proposed NPP regarding future nuclear deployments.

A summary of the key components considered for the PPE are outlined in the overall Scoping Report for the project (WSP, 2026), based on ESKOM (2025b, c) and subsequent communications from ESKOM. This approach however does inherently preclude consideration of relative advantages of the two sites in terms of required marine infrastructure (e.g., the requirement for a stilling basin or intake and outfall tunnels, etc. should the sites support one of these options more readily than the other). As a consequence of using the PPE approach, it is necessary to consider all intake and discharge infrastructure options for both the Bantamsklip and Thyspunt sites despite any specific advantages that may exist for various marine infrastructure options at the two sites.

The two key requirements for a successful EIA, associated Environmental Authorisations and permitting are the timeous generation of:

- a sufficiently encompassing and detailed project description (that includes all possible infrastructure and operations proposed for the planned NPP) to allow for a sufficiently granular and rigorous specialist impact assessments informing the EIA.
- adequate data to provide the environmental baselines for the EIA specialist studies, as well as determine appropriate environmental quality objectives and specific water and sediment guideline thresholds (e.g., PRDW, 2019; ESKOM, 2013, 2025a) to be used in both the impacts assessments and subsequent monitoring activities to meet ESMP and permit requirements.

Specifically, this detail is necessary to ensure adequate granularity and rigour of the assessments to meet both “best practice” and regulatory requirements, specifically those associated with the development of an appropriate Environmental and Social Management Programme (ESMP) and any permitting and/or licencing. The present project will require both an application for a Coastal Waters Discharge Permit (CWDP) and a Dumping at Sea permit (or similar authorisation for any land-based disposal of material).

The required information flows between engineering design, environmental impacts assessment and regulatory authority approval process required to minimise the risk of delays in environmental authorisation processes and permitting, is addressed in detail for:

- capital dredging projects in van Ballegooyen (2012) and for
- land-based effluent discharges into marine environments in van Ballegooyen et al., (2026).

The rigour preliminary impact assessment, the gap analysis and plan of study and screening to determine a preferred site undertaken here, is commensurate with the accuracy of the project description and adequacy of the existing baseline data. Any inadequacies and uncertainties in the project description and available environmental data to:

- ensure a sufficiently rigorous EIA process and
- meet permitting requirements,

are addressed as part of the study and appropriate recommendations provided to resolve any issues in this regard.

Socio-Economic Scoping Study:

The following assumptions underpin this report and the Socio-Economic Impact Assessment undertaken during the Scoping Phase:

- The site alternatives are based on the findings of the Nuclear Site Investigation Programme (NSIP) study undertaken by independent consultants in the 1980s and on further findings from the EIA process for the Nuclear 1 Power Plant.
- The terms of reference for the study do not include an assessment of the power lines routes required to evacuate the power from the proposed NPP sites
- The project description, development footprint, technology options, and construction timelines provided by Eskom are accurate and representative of the proposed development at the time of assessment.
- Available secondary data sources, including census data, municipal information, and published reports, adequately represent baseline socio economic conditions within the project area of influence.
- Stakeholder issues and concerns raised during the limited engagements undertaken during the pre-Scoping Phase are assumed to be broadly representative of key social sensitivities within the affected communities.
- It is assumed that standard industry practices and regulatory requirements will be applied during construction, operation, and decommissioning, including labour management, health and safety controls, and environmental management measures.
- Mitigation measures identified at the Scoping Phase are assumed to be implementable and will be further refined during the EIA Phase.
- No significant unplanned developments or major socioeconomic shocks will occur within the study area that would fundamentally alter baseline conditions before project implementation.

The following limitations apply to this report at the Scoping Phase:

- The Scoping Phase SIA is high-level in nature and does not provide the same level of detail as a full EIA phase Social Impact Assessment. Impact ratings at this stage are therefore preliminary.
- Primary socio-economic surveys were not undertaken during the Scoping Phase; the assessment relies largely on secondary data and stakeholder engagement inputs.
- Some socioeconomic data sources are subject to time lags (e.g. census and municipal datasets) and may not fully reflect recent changes in population dynamics, service provision, or local economic conditions.
- Stakeholder engagement during the pre-scoping provides insight into perceived impacts and concerns but may not capture the full diversity of views across all affected or interested parties.
- The assessment does not quantify employment numbers, economic benefits, or service demands in detail, as these depend on final project design and workforce requirements.
- Cumulative social impacts have been identified conceptually. Still, they could not be assessed in detail due to limited information on the timing and scale of other planned or future developments in the area.
- Site-specific social impacts, including housing demand, immigration effects, and pressure on social services, will require further refinement once the project description is finalised.
- The assessment assumes that future phases of the EIA process will address identified data gaps and refine the assessment of impact significance through more detailed studies and targeted engagement.

Notwithstanding these assumptions and limitations, the Scoping Phase SIA provides a reasonable and defensible basis for identifying key social risks, opportunities, and sensitivities associated with the proposed project and for informing the comparative assessment of alternatives. The findings are intended to guide the focus of the EIA phase SIA, where impacts will be assessed in greater detail and mitigation measures further developed.

Visual Scoping Study:

The following assumptions and limitations have been made in the study:

- The description of project components is limited to what has been supplied to the author prior to the date of completion of this report.
- The accuracy of the viewshed analysis depends on the quality of the input digital surface model (DSM). Readily available digital contours for the area are limited to 20m contours. BCK have interpolated these down to 1m intervals to get better accuracy. However, these types of viewshed investigations (using readily available GIS software and terrain contours only) are limited in their accuracy due to their inability to incorporate vegetation information. To be more accurate at predicting absolute visibility, the analysis would require “a 3D model of a tree/plant and a layer indicating the spatial distribution and density of vegetation on the landscape” (Llobera 2007:799) and buffering all existing buildings, structures and infrastructure. The possibility of indicating both the spatial and density distribution of tree/plants, and the three-dimensional model representing vegetation and all structures, is currently not available to the author. Therefore, on-site observations are critical.
- The position of important or key viewpoints such as farmsteads and homes have not all been visited. The ‘ground truthing’ of this information would have been time-consuming at this level of investigation. However, the contour-based viewshed provides detail line of site visibility information.
- The viewshed map is computer generated and does not take into account intervening local and minor visual interruptions in the landscape such as trees on the edge of roads, minor landforms, buildings, etc. As a result, the visibility on these maps could be overstated. Site observations have identified the most significant obstructions to direct views of the NPP
- Site photos taken in mid-summer (when the site visits were conducted) do not necessarily reflect the complete landscape character of the area as experienced through all seasons i.e. the density of the bush in the summer would further restrict visual access to the site. The weather was sunny with some cloud and haze conditions. Coastal conditions and accompanying visibility can vary greatly from clear skies, to haze, mist and rain.
- The author has relied on the project description and layout that was previously assessed.

Heritage Scoping Study:

- The significance of heritage resources is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.
- It should be noted that archaeological and palaeontological deposits often occur below ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted, and it would be required that the heritage consultants are notified for an investigation and evaluation of the find(s) to take place.

■ Palaeontology – Constraint and Limitations:

No property constraints were encountered. Other minor constraints include the dense short grass vegetation, which was especially prevalent in low-lying areas. Other constraints include: Comparable rock units outside the project site, if not present in the project area, such as riverbanks, gullies, and burrowing pits, can offer insights into the underlying strata but are not always accessible.

Fossils are often concealed by overlying deposits of soil, vegetation, or other surface materials. This obscures their presence and limits direct observation.

Data from distant exposures may be required, reducing the resolution of site-specific interpretations.

There are several factors limit the effectiveness of Palaeontological Impact Assessments:

The absence of a comprehensive South African fossil heritage database.

Varying accuracy levels in geological maps, affecting the reliability and precision of studies.

Insufficient explanations accompanying geological maps and availability of published palaeontological materials.

Limited palaeontological studies conducted in most regions of South Africa, leading to reliance on extrapolation from other locations.

■ Archaeology:

Thyspunt: The area is covered in thick dune vegetation within the proposed study site for the nuclear power station. Areas along the immediate rocky coastal band were revisited to inspect the state of the shell middens and other heritage resources identified by the ACO more than 13 years ago and these sections are relatively easy to access and survey as the vegetation is more limited;

Bantamsklip: The terrain is fairly level and easy to navigate through as the vegetation cover is not impenetrable. The access points off the R43 main road were unlocked and access had been arranged through Eskom's staff which facilitated two visits to the area. The survey achieved sufficient coverage of the area to revisit selected sites documented in depth by Hart (2012) during the initial HIA for the Bantamsklip nuclear power station proposal

Agricultural Potential Scoping Study:

There are no specific assumptions, uncertainties or gaps in knowledge or data that affect the findings of this study.

Noise Scoping Study:

At this stage, the following assumptions and limitations are/will be applicable to the Environmental Acoustic Impact Assessment:

- Due to the erratic nature of the construction phase, construction activities will not be quantified, but rather a qualitative assessment of construction phase acoustic impacts will be undertaken.
- Since the reactor technology will not be selected until after the EIA phase, the Environmental Acoustic Impact Assessment will utilise a worst-case assessment of potential noise sources or alternatively build on the approach adopted in the original Nuclear 1 EIA acoustic assessment.
- The identification of sensitive receptors is based on a desktop assessment using Google Earth™ imagery. It is assumed that all current, inhabited receptors have been included in this report.

Human Health Risk Scoping Study:

The study is based on a number of assumptions, particularly with regard to the baseline health status of the receptor communities, which was derived from provincial and district mortality rates.

The underlying assumption is that the socioeconomic properties and the availability and quality of health services in the receptor communities are similar to the median of the district or province. Sufficient district- or local municipality health data are not readily available to assess the limitations of this assumption, but the associated uncertainty should be borne in mind when considering information presented in this report. The validity of the findings of the study is not expected to be affected by these assumptions and limitations and is the most accurate baseline health assessment currently possible.

Traffic and Transportation Scoping Study:

The following assumptions were made while compiling this Report:

- Low to medium level radioactive waste will be transported and stored at Vaalputs (Northern Cape Province).
- High level radioactive waste (spent fuel) will be stored within the proposed nuclear power station for a period of approximately 60 years, as is currently practised at the existing Koeberg Nuclear Power Station.
- Nuclear fuel delivery to Nuclear-1 will occur during the operational stage approximately 2 to 3 times a year. The fuel will be manufactured offshore, imported via a major South African port, and conveyed by road to the proposed Nuclear-1 site. Due to the infrequent annual fuel delivery consignments, the road transport impacts are expected to be negligible and are required to conform to the regulations for the transport of hazardous materials.
- Decommissioning phase transport impacts expected to be less than construction; to be assessed closer to the time (~60 years post-commissioning).
- Several construction phase details, such as the location of laydown and location of workers' villages, will be assessed in a separate EIA process and are not included in this TIA scope.
- Construction traffic estimates provided by Eskom ("Nuclear-1 Traffic Estimates during Construction and Operation to the Bantamsklip site", June 2010) are used as the planning basis.
- Construction traffic estimates provided by Eskom ("Nuclear-1 Traffic Estimates during Construction and Operation to the Thyspunt site", June 2010) are used as the planning basis.
- The guidelines for the emergency planning zones are derived from the General Safety Requirements Part 7 (2015) and the standards that are stipulated by the National Nuclear Regulator (NNR), 2012. The Exclusion Zone (EZ) is based on the prescribed distances that are provided in the European Utility Requirements and the ETE adapted from the standard times.

Radiological Impact Assessment:

The impacts a NPP project will have on the environment involve collection and analysis of the site vicinity and regional environmental data as well as a thorough understanding of the reactor technology, particularly its discharges to the environment. Any potential radiological impact assessment has associated with it many factors that introduce uncertainties, due to the models and the values adopted for a large number of parameters describing systems for which models are created. The models are simplified representations of complex environmental and human systems.

The dose assessments adopted at this early phase of NPP authorisation (specifically NNR site licensing) adopted a cautious approach using conservative assumptions to account for uncertainties as far as is possible. The main objective is to demonstrate site suitability. Site suitability is achieved when the regulatory dose constraint is met.

A brief overview is provided of some of the uncertainties and main assumptions in the dose assessments.

- Source terms

A bounding source term was used that is representative of the maximum power generating capacity of 33 000 MWth during a 60-year operating period of a NPP consisting of a number of nuclear reactors. The average annual power level will be lower than this maximum value because of the sequential construction of reactor units over a period of multiple years. Power production capacity will also be less than 100 per cent (< 33 000 MWth) as a result of reactor maintenance and refuelling outages, for example.

The modelled radiological impact is dominated by the radioactive carbon (C-14) in the source term for normal NPP operation. The dose to the public and non-human species is highly sensitive to the chemical species of C-14 in the environment. In this assessment of the sites, it was conservatively assumed that the chemical form is inorganic $^{14}\text{CO}_2$. All discharged C-14 therefore participates in the photosynthesis process, as opposed to organic chemical species. This assumption results in a potentially higher dose contribution from ingestion pathways. However, the measured releases of gaseous C-14 from two U.S. and six German commercial pressurised water reactors found that the inorganic release fraction is on average 20 per cent and the organic release fraction is 80 per cent. A more accurate assessment of the radioactive carbon dioxide fraction, $^{14}\text{CO}_2$, of the C-14 source term in the airborne release as well as the liquid release should be used in the radiological assessment when a specific NPP design becomes available.

- Atmospheric dispersion

The semi-empirical Gaussian plume model is used in PC-CREAM 08 for assessing the impact of continuous and routine discharges to the atmosphere. The end-points of the calculations are long-term average or time-integrated concentrations in air, as is normally the case in the assessment of dose from continuous releases. The airborne discharge is assumed to be from a single point at ground level. This assumption results in higher radionuclide concentrations than would be the case for multiple stacks discharging at tens of metres above ground level. When more realistic dispersion is performed by considering a stack/building vents discharge points and building wake effects, smaller dispersion coefficients should be obtained and therefore lower radioactivity concentrations in the environment.

- Dispersion in the sea

It is assumed that the liquid discharge is from a single point into a local marine compartment of limited size used as input to PC-CREAM 08. There are, however, large uncertainties associated with complex behaviour of radionuclides in different marine environments, e.g. sediment distribution coefficients (expressed as Bq/kg in sediment per Bq/l in seawater) and the radionuclide bioaccumulation and biomagnification in marine species at different trophic levels. More advanced marine dispersion modelling should be used to support optimisation studies during the safety analysis of a specific NPP design.

- Public dose and the representative person

Habits data that were used to derive the annual dose to a representative person of the public will change by the time a NPP may become operational at any of the two sites. Although the approach to the dose assessment was to choose habits data to ensure a conservative and bounding results

are determined, a repeat of a habits survey will be required at regular intervals (e.g. every 5 years) for the site selected for the NPP.

Radioactive Waste Management and Transport Scoping Study:

The purpose of the report is to present the Scoping Report for the Study, similar to the scoping deliverables prepared for other specialist disciplines within the S&EIR process (e.g., hydrology, hydrogeology, visual, heritage, wetlands, and human health). However, a careful review of the Study's more specific objectives indicates that the approach proposed for this Study differs from that applied in the other disciplines.

The most notable distinction is that the Study is not site-specific, as it addresses generic aspects of radioactive waste management and transport. These topics are not inherently dependent on a particular site and are therefore largely unaffected by whether the proposed NPP is developed at Thyspunt or Bantamsklip. However, where site-related differences are relevant, the Study will explicitly identify and discuss them.

In addition, while the radioactive waste of concern is generated at the NPP, the issues addressed extend beyond the NPP footprint. The potential area of influence extends beyond the site and immediate environment because certain waste streams must be transported via a designated route to the National Radioactive Waste Disposal Facility at Vaalputs in the Northern Cape Province of South Africa for storage and/or disposal. These scope elements are therefore largely independent of the selected NPP site.

Furthermore, as part of the Nuclear Installation Licence, radioactive waste management and waste transport (where required) must comply with applicable national legislation, associated regulations, and relevant safety standards to protect human health and the environment from exposure to ionising radiation. This national framework is aligned with internationally recognised principles, requirements, guidance, and recommendations developed by organisations with key roles in radiation protection and safety, including the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the International Commission on Radiological Protection (ICRP), and the International Atomic Energy Agency (IAEA).

However, the scope of the Study excludes any quantitative assessment of radiation exposures to humans or the environment. Instead, the scope is limited to a discussion of the overarching principles and generic approaches for managing radioactive waste generated over the life cycle of an NPP, as well as the transport of such waste where required.

Taken together—namely, site independence, a well-defined nuclear legislative and regulatory framework and the absence of quantitative exposure analysis—these conditions make a conventional qualitative or quantitative EIA impact assessment challenging for the following reasons.

- **Dose-criteria-based standards:** The relevant safety standards within the regulatory framework are expressed as a dose limit and a dose constraint that must be met to obtain regulatory authorisation. The safety standards do not provide a basis for classifying exposures as "low", "medium", or "high" relative to the dose limit.
- **Optimisation (ALARA):** The safety standards embed the optimisation principle (ALARA), which requires that exposures be reduced to as low as reasonably achievable, taking into account economic and societal factors. This optimisation process is conceptually different from the mitigation-focused impact-reduction approach typically applied in the S&EIR process.

- Assessment boundary beyond the sites: Given the purpose and scope of the Study, a comparative impact rating between the two proposed sites is not feasible. The issues extend beyond the sites' footprints to include potential transport corridors to the National Radioactive Waste Disposal Facility at Vaalputs.

Air Quality Scoping Study:

Managing uncertainties attempts to eliminate the source of technical disagreements and failure to understand them often leads to a conclusion that all uncertainties need to be eliminated before project decisions can be made. The first decision about how to manage uncertainties relates to their significance given the decision being addressed. In the current context, the different parts of the investigation were grouped into similar uncertainty regimes, namely:

- Dispersion model uncertainties: Modelled results are considered valid when they fall within the generally accepted (US EPA, 2005) “factor of two” accuracy of dispersion models. In quantifying the uncertainty of the modelled results for this assessment, measured ambient data is required which was not available for this study.
- Input data uncertainties: The emissions and dispersion modelling data assessed in this scoping level study was based on the Nuclear-1 study conducted in 2010. The assessment was done based on the best available information and is regarded comprehensive and representative of the project description at the time. Emissions and stack design specifications for the auxiliary power generators were based on the Siemens SGT 700 Gas Turbine design using diesel fuel. The meteorological data used in the Nuclear-1 assessment is regarded representative of the different site conditions. More recent meteorological data is available for Thyspunt (2017 to 2019) but not for Bantamsklip, where the weather station (WS) was decommissioned. Based on the comparisons provided to nearby South African Weather Station (SAWS) records, the prevailing wind fields are unlikely to have changed.
- Methodology of validating model results: Since a reactor technology has not been selected yet and will not be selected as part of this EIA process, it is not clear to what extent the actual technology would differ from what was previously assessed. However, given the typical design of a NPP, it is not expected to result in different impacts to those assessed in the Nuclear-1 assessment.
- Study scope limitations: Whereas the AQIA conducted as part of the Nuclear-1 EIA included the assessment of radiological impacts, this AQIA is limited to the impacts from ambient air pollutants on human health and the receiving environment. The dispersion modelling results will however be provided to the Radiation and Health Risk experts for use in the respective radiation exposure- and comprehensive health risk assessments.

Spatial Planning Scoping Study:

The latest Spatial Development Frameworks are sourced from the local and /or district municipal websites. The assumption is that these are the correct versions.

3 NUCLEAR POWER CONTEXT

3.1 INTRODUCTION AND BACKGROUND

Nuclear power is a significant component of the global energy mix, offering a low-carbon alternative to fossil fuels while providing reliable baseload electricity. Nuclear generation contributes to climate change mitigation by reducing greenhouse gas (GHG) emissions and supporting energy security. However, it also requires careful consideration of environmental and social factors, including site selection, water use, waste management, radiation safety, and long-term decommissioning.

To allow for an understanding of the proposed project, this chapter highlights what nuclear power refers to, the history associated with nuclear power, what the nuclear power generation process entails, what radiation refers to and the effect of nuclear radiation.

3.2 NUCLEAR POWER²⁵

The heat energy generated by nuclear power results from a process called "fission", which entails the splitting of heavy atoms—such as uranium—by even smaller particles, called neutrons. When a relatively large fissile atomic nucleus is struck by a neutron, it forms two or smaller nuclei as fission products, releasing energy and neutrons in a process called nuclear fission. Thereafter, the neutrons trigger further fission, and the fission process continues. When this nuclear chain reaction is controlled, the energy released can be used to heat water, produce steam and drive a turbine that generates electricity at about 20 kV. Finally, electrical transformers on the power plant step up the electricity generated by the turbine generator to 400 kV or 765 kV and feed it into the national grid via transmission powerlines.

A single uranium pellet, as used in a Pressurised Water Reactor (PWR) for example, is capable of releasing as much energy as one ton of coal. A single ton of uranium releases the equivalent amount of energy that would be produced during the combustion of 400 000 barrels of oil.

In simple terms, nuclear power may be described as an efficient way to generate heat, which in turn is used to generate electricity. PWRs with modern Generation III+ designs, typically have a thermal-to-electrical efficiency of approximately 33% to 37%³. Advanced SMR designs, such as HTGRs, can reach up to 45%–50%^{4,5}. Unlike fossil fuels, nuclear power does not release combustion products to the environment and is increasingly recognised as a vital low-carbon option for climate change mitigation within the framework of UN climate change conferences, notably gaining formal recognition at COP28 in 2023. COP28 included a consensus to accelerate “zero- and low-emission technologies”, specifically naming nuclear energy alongside renewables. The International Atomic Energy Agency (IAEA) has played an active role in recent COP conferences (COP26, 27, 28) with

³ Eureka. (2026). Analyzing Energy Efficiency in Pressurized Water Reactors. Available: <https://eureka.patsnap.com/report-analyzing-energy-efficiency-in-pressurized-water-reactors>.

⁴ Esam M.A. Hussein. (2020). Emerging small modular nuclear power reactors: A critical review. *Physics Open*, 5, 100038. Available: <https://www.sciencedirect.com/science/article/pii/S2666032620300259#:~:text=4.4.&text=In%20case%20of%20failure%20of,reactor%20is%201620%E2%88%98C>.

⁵ Nøland, J.K. (n.d.). Overview of Small Modular and Advanced Nuclear Reactors and Their Role in the Energy Transition. DOI 10.1109/TEC.2025.3529616. Available: <https://www.diva-portal.org/smash/get/diva2:1944371/FULLTEXT01.pdf>.

its Atoms4NetZero initiative, presenting nuclear as essential to decarbonising both electricity and hard-to-abate industrial sectors. Furthermore, a 2021 United Nations Economic Commission for Europe (UNECE) report noted that international climate objectives would not be met if nuclear power is excluded⁶.

Nuclear fission provides in excess of 10% of the world's electricity, powers naval vessels around the world, and has powered space missions. Over four hundred nuclear power plants around the world produce approximately 400 GW of electricity.

3.3

HISTORY OF NUCLEAR POWER PLANTS⁷

The initial confirmed instance of nuclear fission occurred in Germany, conducted by Otto Hahn in 1939. The geopolitical climate during World War II necessitated the accelerated advancement of nuclear weapons technology within the United States. On December 2, 1942, a team of researchers led by Enrico Fermi successfully sustained the inaugural controlled nuclear chain reaction within an experimental apparatus known as Chicago Pile 1, which consisted of a significant assembly of uranium and graphite. This reaction was maintained for a duration of 28 minutes, laying the foundational framework for the contemporary thermal nuclear reactor technology.

In the following years after the identification of the nuclear chain reaction, the application of nuclear energy was predominantly confined to military objectives. It was not until the post-war period that efforts were redirected towards the peaceful use of nuclear energy for electricity generation. In 1946, the United States Congress enacted the pivotal Atomic Energy Act, which facilitated the development of nuclear power for non-military purposes.

In December 1951, the first four electric light bulbs were powered by electricity generated from the EBR-1 nuclear reactor in Idaho Falls, marking a significant milestone as the first experimental breeder reactor. Simultaneously, the development of the pressurised water reactor (PWR) proceeded, initially designed for submarine propulsion and successfully tested in 1953.

A major achievement occurred in 1954 in Obninsk, Soviet Union, where the world's first nuclear power plant (NPP), known as APS-1, was successfully commenced. This facility generated a modest output of five megawatts of electric power and was moderated using graphite. It heralded the evolution of the channel-type reactor, specifically the Reaktor Bolshoy Moshchnosti Kanakniy (RBMK). On July 17, 1955, the experimental boiling reactor BORAX-III produced sufficient electricity for the city of Arco in Idaho, representing a notable advancement in nuclear technology.

The inauguration of the first gas-cooled NPP, at Calder Hall in Great Britain, took place on October 17, 1956. This event signified the commencement of the British nuclear program and marked the first commercial utilisation of electricity generated from nuclear power. The Calder Hall facility was eventually decommissioned in 2003 following 46 years of operational service.

⁶ Midgley, E. (2023). IAEA at COP28: The Role of Nuclear Technology in Climate Change Monitoring, Mitigation and Adaptation. Available: <https://www.iaea.org/newscenter/news/iaea-at-cop28-the-role-of-nuclear-technology-in-climate-change-monitoring-mitigation-and-adaptation#:~:text=Mitigation%20and%20Adaptation-.IAEA%20at%20COP28:%20The%20Role%20of%20Nuclear%20Technology%20in%20Climate,are%20impacted%20by%20climate%20change>.

⁷ Nuclear 1 Final Environmental Impact Assessment Report, February 2016

In 1956, the first commercial NPP in the United States, known as Shippingport, commenced operations. This was followed by the construction of the second commercial NPP, Yankee-Rowe, in 1960 in Massachusetts. Both facilities utilised PWR technology and were constructed by Westinghouse Electric Corporation. Furthermore, in 1960, the General Electric Company initiated operations of the first commercial boiling water NPP, located in Dresden near Chicago, Illinois. The first Canadian NPP, designated NPD, was commissioned in 1962, employing natural uranium and heavy water in its operations.

The nuclear power industry has been developing reactor technology for almost five decades since the first nuclear power station came into operation in the 1950s. Since then, and to date, the development of the nuclear power generation industry can be summarised as follows:

- There are currently 413 commercial nuclear power reactors operating in 31 countries, with 377 147 MW of total net electricity capacity⁸;
- A total of 23 reactors has suspended its operation within 2 countries, with a total net electricity capacity 19 687 MW⁸;
- A total of 226 reactors has been shut down permanently, within 22 countries, with a total net electricity capacity of 115 861 MW⁸;
- Nuclear power stations provide about 9 % of the world's electricity as continuous, baseload power, and their efficiency is increasing⁹;
- Over 160 ships are powered by more than 200 small nuclear reactors, ranging from icebreakers to aircraft carriers, most of which are submarines¹⁰; and
- A total of 74 nuclear power reactors with a combined output of approximately 77 707 MW are currently under construction across 16 countries⁸.

3.4 NUCLEAR TECHNOLOGY EVOLUTION

As civil nuclear power developed after the Second World War, reactor technologies evolved in identifiable stages. To describe this progression, the international nuclear community later adopted a “generation” framework, grouping reactors according to their era of development, design philosophy, and safety approach. Although these generational labels were applied retrospectively, they provide a useful structure for understanding how nuclear power plants have changed over time.

3.4.1 GENERATION I (GEN I): FIRST-OF-A-KIND COMMERCIAL PROTOTYPES (1950S–1960S)

Generation I reactors represent the earliest commercial nuclear power plants, developed during the 1950s and 1960s. These reactors were closely derived from military and research reactor designs, particularly those developed for naval propulsion and plutonium production.

⁸ IAEA. (2026). Power Reactor Information System (PRIS). Available: <https://pris.iaea.org/PRIS/WorldStatistics/OperationalReactorsByCountry.aspx>.

⁹ Galindo, A. (2025). What is Nuclear Energy? The Science of Nuclear Power. IAEA. Available: <https://www.iaea.org/newscenter/news/what-is-nuclear-energy-the-science-of-nuclear-power#:~:text=Radioactive%20waste%20makes%20up%20a,now%20and%20in%20the%20future>.

¹⁰ World Nuclear Association. (2025). Nuclear-Powered Ships. Available: <https://world-nuclear.org/information-library/non-power-nuclear-applications/transport/nuclear-powered-ships>.

Typical characteristics included custom, non-standardised designs, limited operating lifetimes, minimal redundancy, and early safety philosophies. Representative examples include the Shippingport Atomic Power Station (USA, first grid connection in 1957), based on early Pressurised Water Reactor (PWR) concepts first developed in the early 1950s, and the Magnox reactors of the United Kingdom, first used commercially in 1956 and named after their magnesium-alloy fuel cladding. All Generation I reactors have now been retired and serve primarily as historical and developmental reference points.

3.4.2 GENERATION II (GEN II): STANDARDISED COMMERCIAL EXPANSION (1970S–1990S)

Generation II reactors form the backbone of the global nuclear fleet. Designed for routine commercial operation, these plants typically had original design lifetimes of 30 to 40 years, with the common extended lifetime of 60 years and further extensions in select cases up to 80 years¹¹. They introduced standardised designs, improved reliability, and formal regulatory oversight.

The dominant reactor types of this generation include the Pressurised Water Reactor (PWR), first used for electricity production in the late 1950s and widely deployed from the 1960s onward; the Boiling Water Reactor (BWR), first deployed commercially in the early 1960s; and the Pressurised Heavy Water Reactor (PHWR), commonly known as CANDU (CANada Deuterium Uranium), which first connected to the grid in the early 1960s in Canada. Most operating reactors worldwide today fall into this category.

3.4.3 GENERATION III AND III+ (GEN III / III+): EVOLUTIONARY SAFETY ENHANCEMENTS (1990S–PRESENT)

Generation III reactors represent evolutionary improvements over Generation II designs. The terminology emerged in the 1990s following lessons learned from major nuclear accidents, particularly Three Mile Island (1979) and Chernobyl (1986), which are discussed in more detail in Section 3.10.1 below and summarised in Table 3-1.

Table 3-1 – Lessons Learned from Major Nuclear Accidents¹²

Major Nuclear Accidents	Lesson	Impact	Design change
Three Mile Island (1979, USA)	Led to comprehensive reforms in U.S. nuclear safety regulation, operator training, and reactor design. The Nuclear Regulatory Commission redesigned control room displays, improved emergency procedures, and established the Institute of Nuclear Power Operations (INPO) to enhance industry-wide safety culture.	Generation III reactors emphasise simplified control systems, automation, and clearer operator interfaces to reduce human error.	Enhanced instrumentation and control systems with redundancy.

¹¹ Crownhart, C. (2024). Why the lifetime of nuclear plants is getting longer. MIT Technology Review. Available: <https://www.technologyreview.com/2024/04/04/1090630/old-nuclear-plants/>.

¹² NukeSim. (2025). Nuclear Accidents and Safety. Learning from Chernobyl, Fukushima, and the Path to Safer Nuclear Power. Available: <https://www.nukesim.com/blog/nuclear-accidents-safety>.

Major Nuclear Accidents	Lesson	Impact	Design change
Chernobyl (1986, USSR)	The disaster underscored the dangers of operating reactors with design flaws and without robust containment structures to prevent radiation release. It revealed the consequences of inadequate safety culture, poor operator training, and the absence of transparent communication during emergencies. From Chernobyl, the world learned that nuclear plants must be designed with inherent safety features, strong physical containment, strict regulatory oversight, and a culture that prioritises safety above production.	Generation III reactors require robust containment structures and fail-safe reactor designs that prevent runaway reactions.	Reactors must be inherently stable, with negative reactivity coefficients (reactivity decreases as temperature rises).
Fukushima (2011, Japan)	The disaster highlighted that nuclear plants must be designed to withstand extreme external hazards and prolonged station blackouts. The disaster revealed vulnerabilities in relying on active safety systems that depend on electricity and operator intervention, as the earthquake and tsunami disabled backup generators and cooling systems. Key lessons included the need for passive safety mechanisms that function without power, diversified and elevated backup systems to avoid flooding, and stronger site resilience against earthquakes and tsunamis. It also emphasised the importance of emergency preparedness, transparent communication, and international cooperation to manage crises effectively and maintain public trust.	Generation III reactors incorporate passive safety systems that work without external power or human intervention.	Elevated backup power systems, diversified cooling methods, and improved flood/earthquake resilience.

Common contributing factors are highlighted below:

- Human factors: All three accidents involved operator errors or inadequate training.
- Design issues: Each revealed specific design vulnerabilities in reactor systems.
- Communication problems: Poor information flow hampered emergency response.
- Regulatory oversight: Insufficient attention to known vulnerabilities.
- Safety culture: Complacency and normalisation of risk contributed to accidents.

The lessons learnt were incorporated into the designs which incorporate enhanced defence-in-depth, improved materials, and stronger safety systems. Generation III+ further advances this approach by introducing passive safety systems that rely on gravity and natural circulation, explicit severe-accident mitigation features, and extended design lifetimes of 60 years or more. These reactors are predominantly Light Water Reactors (LWRs), a term first used in the 1950s to distinguish water-cooled reactors from gas- or metal-cooled systems.

In terms of the safety features, these modern reactor designs incorporate passive safety systems that do not require power or human intervention to function. These systems use natural forces like gravity and convection to provide emergency cooling. The safety features for Generation III+ are highlighted in Table 3-2.

Table 3-2 – Generation III+ Reactors Safety Features¹²

Passive Safety Features	Enhanced Containment
Gravity-fed emergency cooling systems	Double-walled containment structures
Natural circulation for heat removal	Hydrogen recombiners to prevent explosions
Passive containment cooling	Filtered containment venting systems
Automatic reactor shutdown systems	Higher design pressure ratings
Core catcher systems to contain melted fuel	Extended station blackout capability

3.4.4 GENERATION IV (GEN IV): ADVANCED AND INNOVATIVE REACTOR SYSTEMS (CONCEPTUAL TO EARLY DEPLOYMENT)

Generation IV reactors represent a strategic shift toward innovative nuclear systems. The term Generation IV was formally adopted in the early 2000s through international collaboration focused on sustainability, waste minimisation, and long-term energy security.

Generation IV concepts explore new coolants, fuel forms, and neutron spectra, and aim for higher efficiency and inherent safety. Key concepts include the High-Temperature Gas-Cooled Reactor (HTGR), first demonstrated experimentally in the 1960s; the Very High Temperature Reactor (VHTR), proposed in the 1990s for hydrogen and industrial heat applications; the Sodium-cooled Fast Reactor (SFR), with origins in fast-reactor research of the 1950s; the Lead-cooled Fast Reactor (LFR), derived from 1960s naval reactor concepts; the Gas-cooled Fast Reactor (GFR); the Molten Salt Reactor (MSR), first operated experimentally in the 1960s; and the Supercritical Water-Cooled Reactor (SCWR), proposed in the 1990s. Most Gen IV systems remain at research or early demonstration stages.

3.4.5 SOUTH AFRICA AND THE PBMR (PEBBLE BED MODULAR REACTOR)

South Africa's PBMR programme (1990s–2010) sought to commercialise a Generation IV high-temperature gas-cooled reactor (HTGR) using TRISO-fuelled graphite pebbles and helium coolant. The reference electrical configuration targeted ≈ 165 MWe per module with inherent safety characteristics and high outlet temperatures suitable for industrial heat as well as electricity.

Although the PBMR demonstration plant was never built and public funding ceased in 2010, the programme established significant capabilities, including a prototype TRISO fuel line and high-temperature helium test facilities. The design heritage influenced subsequent HTGR efforts worldwide. China's HTR-PM, a 210 MWe plant comprising two 250 MWt pebble-bed modules coupled to one turbine, entered commercial operation in late 2023, demonstrating the concept at utility scale.

Recent policy statements (*Cabinet officially lifts PBMR from care and maintenance – Engineering News, 13 Nov 2025*) indicate renewed South African interest in advanced small modular reactors, including options derived from PBMR know-how for industrial heat, hydrogen, and coal-plant repowering.

3.5 NUCLEAR POWER PLANTS IN SOUTH AFRICA – KOEBERG^{7,13}

South Africa's journey into nuclear energy commenced with the establishment of the Koeberg Nuclear Power Station (Koeberg), construction started in 1976. This facility is owned and operated by Eskom. Unit 1 was synchronised to the national grid on April 4, 1984, followed by Unit 2 on July 25, 1985. Presently, Koeberg stands as the only NPP in South Africa, situated approximately 30 km north of Cape Town, near Melkbosstrand along the western coastline.

The initial expectation was for Koeberg to function as the sole baseload power station in the Western Cape, primarily due to the prohibitive costs associated with transporting fossil fuels from other regions, which made the establishment of a coal-fired power plant in the area economically unviable. At the time Koeberg was commissioned, the demand for electricity in the Western Cape was below the capacity of the plant, resulting in the surplus power being distributed to other regions of South Africa. However, current energy demands in the Western Cape (4 000 MW) have outstripped Koeberg's output capacity (1 800 MW), necessitating the import of approximately 3 000 MW into the Cape region to meet the increasing energy requirements (5 700 MW by 2035)¹⁴.

Koeberg is equipped with two PWRs, fuelled by uranium and supplied by Framatome of France under a licensing agreement with Westinghouse in the United States. The plant operates two large turbine generators exceeding 900 MW, yielding a total capacity of 1 800 MW available for the national grid, accounting for internal consumption.

Koeberg was originally designed for a 40-year operational life. Koeberg Unit 1 reached 40 years of commercial operation on 21 July 2024, and, through a comprehensive Long-Term Operation (LTO) programme, its operation has been extended by 20 years, until 21 July 2044. Koeberg Unit 2 reached 40 years of commercial operation on 09 November 2025 and, under the same LTO programme, has also been granted an additional 20 years, until 09 November 2045.

Notably, the grounds surrounding Koeberg encompass a nature reserve of 30 km². The Koeberg Private Nature Reserve was formally proclaimed in 1991 under Ordinance 19 of 1974. Although this designation predates the enactment of the National Environmental Management: Protected Areas Act (2003), the reserve is now governed under the provisions of the newer legislation, which incorporates previously protected areas. In accordance with the Act, the reserve is managed through an approved Management Plan that guides conservation activities, land use, and ecological stewardship in alignment with national environmental objectives.

The establishment of the nature reserve was primarily driven by the need to support the safe operation of the Koeberg NPP while conserving the surrounding natural habitat. It serves as a protective buffer zone around the facility and preserves land for potential future development. The reserve spans approximately 3 000 hectares and encompasses a diverse range of habitats, including seasonal wetlands, coastal dune fields, Cape Flats Dune Strandveld, Atlantis Sand

¹³ Eskom. Koeberg Nature Reserve. Available at <https://www.eskom.co.za/eskom-divisions/gx/visitor-centres/koeberg-private-nature-reserve/>.

¹⁴ Swart, J. (2025). WHITE PAPER: Electricity independence for the Western Cape. CapeXit. Available: <https://capexit.org/white-paper-electricity-independence-for-the-western-cape/>.

Fynbos, and an intertidal zone. It also overlays two significant aquifers—the Primary Sandveld Aquifer and the Malmesbury Aquifer—highlighting its hydrological importance.

The reserve supports a rich array of wildlife. Mammal species include Steenbok (*Raphicerus campestris*), Common Duiker (*Sylvicapra grimmia*), Springbok (*Antidorcas marsupialis*), Burchell's Zebra (*Equus burchelli*), Eland (*Taurotragus oryx*), Gemsbok (*Oryx gazella*), Caracal (*Caracal caracal*), and Small Grey Mongoose (*Alerella pulverulenta*). Amphibian diversity is notable, with nine species potentially present, eight of which are confirmed or probable. Reptile surveys have recorded 40 species, including two Red Listed species of probable occurrence—Gronovi's Dwarf Burrowing Skink (*Scelotes gronovii*, Near Threatened) and Southern Adder (*Bitis armata*, Vulnerable)—and one confirmed Red Listed species, the Bloubaai Dwarf Burrowing Skink (*Scelotes montispectus*, Near Threatened).

Avian biodiversity is particularly rich, with over 210 bird species identified within the reserve. Notable examples include the Black-winged Kite (*Elanus caeruleus*), African Black Oystercatcher (*Haematopus moquini*), Cape Bulbul (*Pycnonotus capensis*), and Cape Robin Chat (*Cossypha caffra*), among many others. This diversity underscores the ecological value of the reserve and its role in regional conservation efforts.

In addition, there is a visitors centre, a conference centre, a weather station, the Duynefontyn substation and a number of other auxiliary buildings within the close surroundings of the Koeberg NPP, as depicted in Figure 3-1¹⁵.

¹⁵ Eskom. Attachment 5 – Koeberg Site Map (K-27660-E) (2012). Available at: <https://www.eskom.co.za/koeberg-long-term-operation/>.



Figure 3-1 – Koeberg Site Map

3.6 NUCLEAR FUEL CYCLE^{16,23}

When uranium is mined, it is extracted from the earth's crust in a form that is not useable for power generation. As such, mined uranium must undergo a process that enriches the uranium isotope, which is uranium-235 before it can be used to generate power within a nuclear reactor.

The diagram below represents the entire nuclear fuel cycle (Figure 3-2):

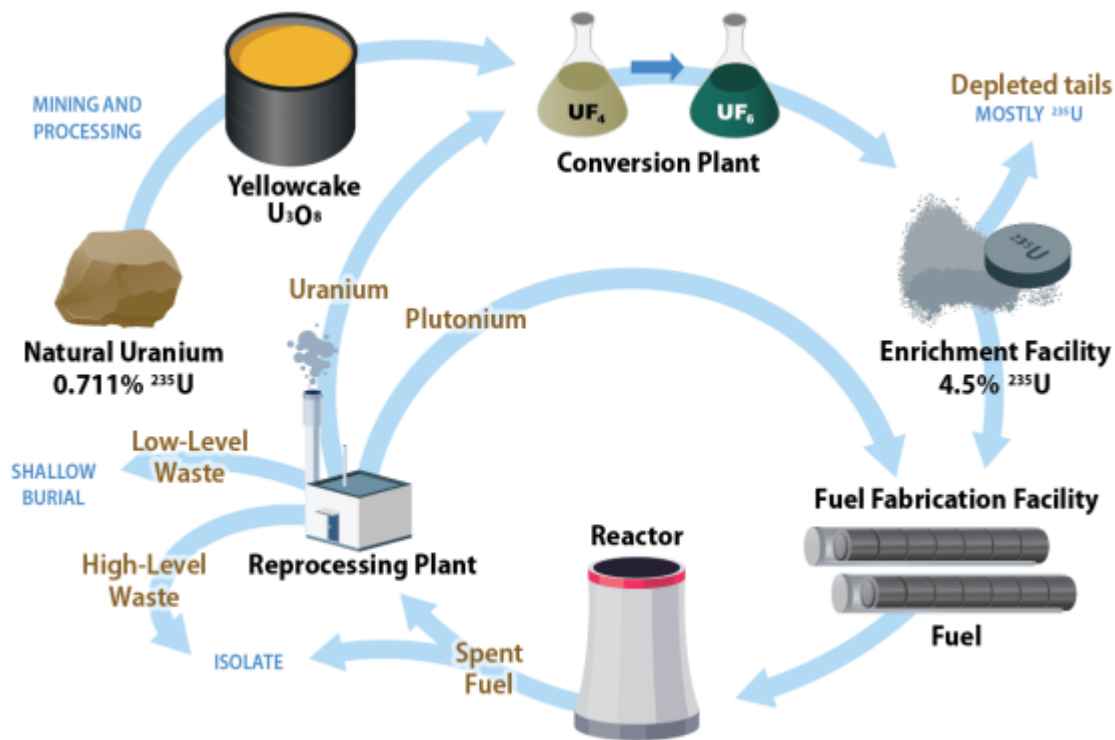


Figure 3-2 – Nuclear Fuel Cycle¹⁶

The core steps associated with the production of nuclear fuel for use in a nuclear reactor include mining and milling, conversion, enrichment and fuel fabrication. Other components of the process deal with the uranium once it has been utilised by the reactor. The stages are described in detail below²³.

3.6.1 MINING AND MILLING

Mining and milling represent the first two processes in the nuclear fuel cycle. Uranium is an ore that is mined either as open cut or underground mining, or through a process of in situ leaching, which is dependent on the depth at which the ore may be found. Once mined, the ore is sent to a mill where it is crushed and ground to a slurry. Sulphuric acid is then added to dissolve the uranium from the

¹⁶ U.S. Government Accountability Office. (2021). Commercial Spent Nuclear Fuel – Congressional Action Needed to Break Impasse and Develop a Permanent Disposal Solution, GAO-21-603.

other materials. The uranium solution is then filtered, separated and dried to produce a solid uranium concentrate termed “yellow cake”. It is this uranium oxide concentrate or U_3O_8 that is used in the next step of the cycle. Approximately 200 tonnes of U_3O_8 is required on an annual basis to maintain a 1 000 MW nuclear power reactor. If compared to oil or coal, 1 800 000 tonnes of oil and 3 000 000 tonnes of coal would be required to produce the same amount of electricity.

3.6.2 CONVERSION

Given that the uranium needs to be in a gaseous form before it can be enriched, the U_3O_8 is converted to gas uranium hexafluoride (UF_6). This can only happen at a conversion plant either in Europe, Russia or North America as South Africa no longer has an operating plant to implement the conversion process.

3.6.3 ENRICHMENT

Enrichment refers to the process of concentrating the amount of Uranium (U)-235 isotope, compared with the U-238 isotope. Nearly all the nuclear power reactors in operation or under construction require enriched uranium where the proportion of the U-235 isotope is raised from the natural level of 0.7% to about 3-5%. This process removes approximately 85% of the U-238 by separating gaseous uranium hexafluoride into two streams. One stream is enriched to the level required for fabrication (the next step in the fuel cycle) while the other is depleted in U-235 (It is mainly U-238).

3.6.4 FUEL FABRICATION¹⁷

Fuel fabrication in a nuclear power plant involves the preparation of fissile material into a usable form that can sustain a controlled chain reaction within the reactor core. The process typically begins with uranium dioxide (UO_2) powder, which is pressed into pellets and sintered at high temperatures to achieve the required density and stability. These pellets are then loaded into long, sealed tubes made of zirconium alloy, forming fuel rods. Fuel rods are assembled into bundles or fuel assemblies, which are specifically designed to fit into the reactor core of pressurised water reactors (PWRs) or boiling water reactors (BWRs). The rod-based system provides a rigid, structured arrangement that allows precise control of coolant flow, neutron moderation, and fuel burn-up, ensuring predictable reactor performance and safety.

By contrast, pebble-bed reactor designs use spherical fuel elements, commonly referred to as pebbles, rather than rods. Each pebble is a graphite sphere containing thousands of small fuel particles coated with ceramic layers that act as containment barriers. Pebble fuel offers inherent safety advantages due to its high-temperature tolerance and the ability to continuously refuel the reactor by adding or removing pebbles during operation. Unlike fuel rods, which require periodic shutdowns for refuelling, pebble-bed reactors can operate with an online refuelling cycle, enhancing efficiency and flexibility. The key distinction lies in geometry and handling: fuel rods are structured

¹⁷ World Nuclear Association (2021) *Nuclear Fuel and its Fabrication*. World Nuclear Association. Available at: <https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/fuel-fabrication>? (Accessed: 11 February 2026).

assemblies requiring batch replacement, while pebble feedstock is modular, mobile, and designed for continuous circulation within the reactor core.

3.6.5 SPENT NUCLEAR FUEL (SNF) STORAGE

To ensure that the performance of a reactor is optimised, approximately one-third of the spent nuclear fuel (SNF) is removed every 12 to 18 months and replaced with new fuel. When the SNF is removed from the reactor, it is very radioactive and hot and must therefore undergo cooling and be shielded from people. It is therefore placed in spent fuel cooling ponds at the reactor site. The storage ponds are steel-lined concrete tanks, approximately eight metres deep and filled with water.

The heat and radioactivity decrease over time, and after about 40 years the heat and radioactivity are down to about 1/1,000 of what it was when initially taken from the reactor.

There are essentially two alternatives for the storage of SNF. Firstly, to store SNF in the ponds, as mentioned above, and secondly to dry store it in specifically engineered facilities that are cooled by air. It should be noted that both methods as described above are required until the SNF is sent for reprocessing (described below) or long-term storage without reprocessing.

3.6.6 REPROCESSING

This is the process in which the uranium and plutonium is separated from waste and the fuel assembly cladding. The recyclable portion is mostly uranium depleted to less than 1% U-235, with some plutonium, which is most valuable. If the SNF is reprocessed at a later stage, about 97% of the SNF can be recycled leaving only 3% as high-level waste. Currently, the skills and technology required to set up a reprocessing facility are not available in South Africa. There are major commercial reprocessing plants operating in France and Japan.

Arising from a year's operation of a typical 1000 MW nuclear reactor, about 230 kilograms of plutonium (1% of the SNF) is separated during reprocessing. This can be used in fresh mixed oxide (MOX) fuel.

Approximately 3% of the reprocessed SNF constitutes high-level waste, which amounts to 700 kg per year. This waste must be isolated from the environment for a very long time. These wastes are in liquid form and are stored in stainless steel tanks inside concrete cells until solidified.

3.6.7 VITRIFICATION

Once reprocessing of the liquid high-level waste has occurred, it may be calcined (heated strongly) to convert it to a powder form, which may in turn be combined with borosilicate (Pyrex) glass, trapping the waste. The glass is then poured into stainless steel canisters, each of which can hold 400 kg of glass. A year's waste generated by a 1 000 MW reactor could therefore be incorporated in five tonnes of glass, or approximately 12 canisters, with the following dimensions: 1.3 m high and 0.4 m in diameter, that may then be easily transported and stored with the appropriate care.

3.6.8 FINAL DISPOSAL

The SNF assemblies are stored underwater. Storage racks provide sufficient capacity in the SNF pools to contain these assemblies for the life of the NPP. Water cools the fuel rods and serves as an effective shield to protect workers in the fuel storage building from radiation. Radiation starts decreasing immediately after the fission reaction has stopped and within about ten years has decreased by more than 95%. SNF will either be sent to a reprocessing facility when uranium extraction becomes viable, or it will be disposed of at an approved repository.

3.6.9 NUCLEAR WASTE⁷

NPPs, as with any other nuclear industry, produce nuclear waste which can take a solid, liquid or gaseous form. Depending on the level of radioactivity, waste is divided into four main groups, as outlined in Table 3-3 below.

Table 3-3 – Types of Waste Generated from a NPP⁷,

TYPE OF WASTE	DESCRIPTION
Exempt Waste	Activity levels at or below levels found in natural materials (natural background radiation levels).
Low-level waste (LLW)	Consists of day-to-day refuse such as paper, gloves, glassware, plastic containers and disposable overalls and overshoes, most of which have low traces of radioactive contamination. LLW is compressed into steel drums, sealed and transported for disposal.
Intermediate-level waste (ILW)	Consists of radioactive resins and sludges, spent filter cartridges and scrap metal pieces from normal maintenance work. ILW is solidified by combining it with a sand/cement mix, which is poured into concrete drums. The drums are transported to the radioactive waste disposal burial site. The drums have a design life of hundreds of years, although the waste they contain will reach natural radiation levels after a hundred years.
High-level waste (HLW)	SNF is what remains when the SNF has been chemically processed to remove usable plutonium and uranium. After processing, HLW in synthetic-rock form will be buried about 1 km deep at waste repositories.

3.6.10 TRANSPORTATION OF RADIOACTIVE MATERIAL^{18,19}

Transportation of radioactive material from a NPP to a designated waste management facility is conducted under strict international and national regulatory frameworks to ensure safety and environmental protection. The process involves packaging radioactive waste in specially engineered casks designed to withstand extreme conditions, including fire, impact, and immersion. These casks are rigorously tested and certified to prevent the release of radioactive material during transit. Depending on the volume and type of waste, transport may occur via road, rail, or sea, with each mode subject to stringent oversight. The International Atomic Energy Agency (IAEA) provides global standards for such operations, while national regulators enforce compliance at the local level. This includes the NNR Regulatory Guide for General Transport Guidance and the Department of Health's Radiation Control Unit under the South African Health Products Regulatory Authority (SAHPRA) and the National Radioactive Waste Disposal Institute (NRWDI), which is responsible to ensure all waste disposal operations comply with international standards²⁰. Escort vehicles, surveillance systems, and contingency plans are often employed to mitigate risks and ensure secure delivery to the waste facility.

¹⁸ International Atomic Energy Agency (IAEA) (2024) Transport Safety of Radioactive Material. Available at: <https://www.iaea.org/topics/transport-safety>.

¹⁹ World Nuclear Association (2025) Radioactive Waste Management. World Nuclear Association. Available at: <https://world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-waste/radioactive-waste-management.aspx>.

²⁰ National Nuclear Regulator (NNR). Regulatory Guide: General Transport Guidance, RG-0008, Rev 0

3.7 OPERATION OF A TYPICAL NUCLEAR POWER PLANT²¹

All nuclear power plants, irrespective of the specific nuclear technology work in broadly the same way. They use heat generated by controlled nuclear reactions to produce electricity. The key steps in this process are common to all technologies, even though the detailed designs differ, with the main stages:

- Fuel inside the reactor produces heat.
- The heat is removed by a cooling system.
- The heat is converted into electricity using turbines and generators.
- Unused heat is released to the environment through cooling systems.
- Electricity is sent to the national grid.

3.7.1 REACTOR CORE AND FUEL

The reactor core is the heart of a nuclear power plant. It is the part of the plant where nuclear fuel is located, controlled nuclear reactions take place and heat is generated for electricity production.

The fuel provides the energy source, while the core structure ensures that the nuclear reaction remains stable, controlled, and evenly distributed.

Across all nuclear technologies, the reactor core performs the same fundamental function: to generate heat safely and predictably, while allowing that heat to be removed by the cooling system.

Regardless of reactor type, the core contains the following key elements:

- Nuclear fuel, which undergoes fission and releases heat
- Structural components, which hold the fuel in place and maintain geometry
- Control systems, which regulate the rate of the nuclear reaction
- Coolant flow paths, which allow heat to be carried away

These elements work together to ensure that the nuclear reaction is self-limiting and controllable, rather than rapid or uncontrolled.

Pressurised Water Reactors (PWR) and Boiling Water Reactors (BWR)

In PWRs and BWRs, fuel consists of small ceramic uranium oxide pellets. The pellets are sealed inside long metal tubes (fuel rods), with the fuel rods grouped into fuel assemblies, which are placed inside the reactor core. This fuel form is chemically stable, retains radioactive material under normal conditions, and has decades of operating experience.

Fuel assemblies are arranged in a regular grid pattern. Water flows upward through the core to remove heat. In a PWR, water remains liquid, but in the case of a BWR, some water boils inside the core.

²¹ International Atomic Energy Agency (IAEA) Safety Standards Series – Management of Radioactive Waste from Nuclear Power Plants and Research Reactors (No. WS-G-2.5).

To control the reaction, control rods, made of neutron absorbing materials, are inserted between fuel assemblies. In PWRs, dissolved boron in the water provides additional control. In BWRs, control rods are inserted from below the core.

Key implications: The fuel is fully contained within sealed cladding and the reactor vessel. There are no routine environmental releases from the core. Used fuel is removed periodically and stored under controlled conditions

Pressurised Heavy Water Reactors (PHWR / CANDU)

Fuel is still uranium oxide, but usually natural (unenriched) uranium. Fuel is assembled into short bundles, not long assemblies, and bundles are placed inside horizontal pressure tubes.

The core consists of many parallel pressure tubes. Heavy water surrounds the tubes and slows down neutrons, as coolant flows through each tube individually.

Fuel can be added and removed while the reactor is operating, which results in a steady fuel cycle rather than periodic shutdowns.

Key implications: Fuel handling systems operate frequently but are enclosed. Heavy-water systems produce tritium, which is managed through dedicated systems.

High Temperature Gas Cooled Reactors (HTGR)

HTGRs use a fundamentally different fuel form, with fuel made up of very small fuel particles. Each particle is coated with multiple protective layers. Particles are embedded in graphite to form spherical “pebbles”, or solid graphite blocks.

This fuel is designed to retain radioactive material even at very high temperatures.

The core is large and graphite rich, with helium gas that flows through the core to remove heat, and with fuel temperatures that can be significantly higher than in water cooled reactors.

Control rods are inserted into the graphite structure, with the physics of the design inherently limiting temperature increases.

Key implications: Fuel robustness reduces the likelihood of fuel damage, with the core design supporting passive safety features.

Current SNF Storage

In South Africa, SNF is currently stored on-site at Koeberg, with government strategies for managing used fuel still under development. The National Radioactive Waste Disposal Institute Act (“NRWDIA”), which became effective on December 1, 2009, mandates the creation of the NRWDI to oversee radioactive waste management on a national level. The NRWDI is currently pursuing a centralised used fuel storage facility.

3.7.2 REACTOR PRESSURE VESSEL

The reactor pressure vessel (or equivalent structure) is the central physical structure of a nuclear power plant. Its primary purpose is to:

- Contain the reactor core and nuclear fuel
- Hold the reactor coolant under controlled conditions
- Provide a strong, leak tight barrier between radioactive materials and the environment

In practical terms, the reactor pressure vessel forms the first major physical boundary around radioactive material. It is designed to withstand high temperature, pressure, radiation, and long-term operation, while allowing heat to be safely removed from the reactor.

Although different nuclear technologies use different internal layouts, all nuclear power plants include a robust structure that performs the same essential role as a reactor pressure vessel.

Pressurised Water Reactors (PWR)

In a PWR, the reactor pressure vessel is a large, thick walled steel vessel, typically cylindrical with a removable top head. It contains:

- The reactor core and fuel assemblies
- Control rods and internal support structures
- Pressurised reactor cooling water

The vessel operates at high pressure, which allows the cooling water to reach high temperatures without boiling.

The reactor pressure vessel:

- Maintains pressure in the primary cooling circuit
- Ensures continuous cooling of the fuel
- Provides structural support for the reactor internals

All radioactive materials remain inside the vessel and connected piping during normal operation.

Key implications: The vessel is a sealed system with no routine releases, with the integrity fundamental to preventing radioactive discharges. Decommissioning of the vessel is a long term, controlled activity involving large steel components.

Boiling Water Reactors (BWR)

BWRs also use a single, large steel reactor pressure vessel, similar in overall form to that of a PWR. The key difference lies in how the coolant behaves inside the vessel.

In a BWR, water enters the vessel as a liquid. It boils inside the vessel as it passes through the reactor core. Steam and water are separated inside the vessel

The vessel in a BWR:

- Contains both the reactor core and the steam / water separation systems
- Forms part of the electricity producing process, not just heat removal
- Connects directly to the steam lines leading to the turbine

Because steam is produced inside the vessel, the radiological boundary extends further into the plant, compared to a PWR.

Key implications: The pressure vessel still prevents direct releases to the environment, with additional systems to manage radioactive steam and off-gases. The presence of radioactive steam outside the vessel influences building design and ventilation systems

Heavy Water Reactors (PHWR / CANDU)

PHWRs differ fundamentally from PWRs and BWRs in that they do not use a single large reactor pressure vessel. Instead, the reactor core is housed within:

- A low pressure vessel called a calandria, containing heavy water moderator
- Hundreds of horizontal pressure tubes, each holding fuel and pressurised coolant

Each pressure tube effectively acts as a small pressure vessel.

Heat is removed from the fuel inside individual pressure tubes. The calandria vessel provides neutron moderation but operates at low pressure. This design allows refuelling while the reactor is operating

Key implications: The pressure retaining function is distributed across many components. Heavy water management (including tritium) is a key consideration. The Environmental implications are similar to other reactors but monitoring focuses on different systems.

High Temperature Gas Cooled Reactors (HTGR)

HTGRs use a reactor pressure vessel, but it operates under very different conditions to water cooled reactors. The vessel:

- Contains the reactor core and graphite structures
- Holds helium gas rather than water
- Operates at lower pressure than PWRs, but at much higher temperature

The vessel supports high temperature operation without boiling or phase change. It enables passive heat removal through natural heat transfer mechanisms. It works together with fuel designed to retain radioactive material even at high temperatures.

Key implications: The lower pressure reduces the likelihood of rapid coolant loss, with the vessel contributing to inherent safety characteristics. External environmental impacts remain dominated by downstream cooling systems.

3.7.3 COOLING CIRCUITS

In all nuclear power plants, the cooling circuit has two related but distinct functions:

- To remove heat from the reactor core during normal operation and after shutdown
- To reject excess heat to the environment once electricity has been generated

While nuclear technologies differ in design, the fundamental cooling logic is the same across all reactor types. Heat is produced in the reactor, transferred by a coolant to a power-conversion system, and then released to an external heat sink such as a river, sea, or cooling towers.

From an environmental perspective, the final heat-rejection step is the most important, as this is where the plant interacts directly with the surrounding environment.

Pressurised Water Reactors (PWR)

PWRs use three physically separate cooling circuits, each with a specific role.

- Primary cooling circuit (reactor coolant system):
 - Ordinary water circulates through the reactor core
 - The water is kept at high pressure so it does not boil
 - It removes heat directly from the fuel
 - Because it is in contact with the fuel, this water becomes radioactive and remains fully contained within the nuclear island
- Secondary cooling circuit (steam cycle):

- Heat from the primary circuit is transferred to a separate water system via steam generators
- This secondary water boils to produce steam
- The steam drives the turbine-generator to produce electricity
- This circuit is non-radioactive under normal operation
- Tertiary cooling circuit (heat rejection):
 - After passing through the turbine, steam is condensed back into water
 - Cooling is provided by seawater, river water, dam water, or cooling towers
 - This water does not come into contact with radioactive systems

Key implication: The use of three separate circuits ensures that radioactive material is confined, while environmental impacts are mainly associated with cooling-water abstraction and thermal discharge.

Boiling Water Reactors (BWR)

BWRs simplify the arrangement by combining functions.

- Reactor and steam generation:
 - Water flows through the reactor core and is allowed to boil inside the reactor vessel
 - Steam produced in the reactor is sent directly to the turbine
 - Because the steam has been in contact with the fuel, parts of the turbine system are within the radiological boundary
- Cooling and heat rejection:
 - After the turbine, steam is condensed in the same way as in a PWR
 - Cooling water systems and environmental interactions are similar to those of a PWR

Key implication: BWRs have fewer cooling circuits but require additional systems to manage radioactive steam and off-gases. Environmental impacts related to cooling water are broadly comparable to PWRs.

Pressurised Heavy-Water Reactors (PHWR / CANDU)

PHWRs perform the same cooling functions as PWRs but use heavy water in the reactor.

- Primary cooling circuit:
 - Heavy water circulates through pressure tubes containing the fuel
 - Heat is removed from the reactor core
 - The heavy water becomes radioactive, including the formation of tritium
- Secondary circuit:
 - Heat is transferred to a light-water system to produce steam
 - Steam drives the turbine in a conventional manner
- Heat rejection:
 - Condenser cooling systems are the same as for other steam-cycle plants

Key implication: The cooling circuit arrangement is familiar, but environmental management places additional focus on tritium control and monitoring.

High-Temperature Gas-Cooled Reactors (HTGR)

HTGRs differ primarily in the type of coolant used in the reactor.

- Primary cooling circuit:

- Helium gas flows through the reactor core
- Helium is chemically inert and does not boil
- It removes heat at much higher temperatures than water-cooled reactors
- Heat transfer and power generation:
 - In current designs, hot helium transfers heat to a steam generator
 - Steam then drives a conventional turbine
 - Future designs may use gas turbines directly, without steam
- Heat rejection:
 - If a steam cycle is used, condenser cooling systems are still required
 - Cooling water use can be lower per unit of electricity due to higher efficiency

Key implication: HTGRs change how heat is removed from the reactor, but do not eliminate the need for a cooling system that releases heat to the environment.

3.7.4 PRESSURISER

The pressuriser is a key pressure-control component in water-cooled nuclear power plants. Its primary function is to maintain the reactor coolant system within a defined pressure range so that coolant behaviour remains predictable and system integrity is preserved. By accommodating changes in coolant volume and pressure during normal operation and transients, the pressuriser supports safe and stable reactor operation.

Although the detailed design differs between reactor technologies, the underlying function is the same: to manage pressure changes caused by temperature variations, power changes, and operational transients, and to prevent conditions that could challenge fuel integrity or system boundaries.

Across nuclear technologies that use pressurised coolant systems, the pressuriser performs the same fundamental function: to control system pressure in a controlled and gradual manner, rather than allowing rapid or uncontrolled pressure changes.

Regardless of reactor type, pressure control systems typically include the following key elements:

- A pressure-containing volume connected to the primary coolant system
- Means of increasing pressure (heating or compression)
- Means of reducing pressure (cooling, condensation, or relief paths)
- Instrumentation and control systems to monitor and regulate pressure

These elements work together to ensure that coolant remains within its intended phase (liquid or gas), and that mechanical and thermal stresses on plant components remain within design limits.

Pressurised Water Reactors (PWR)

In PWRs, the pressuriser is a dedicated vertical vessel connected to the reactor coolant system by a surge line. The vessel contains both water and a steam space. Pressure is increased by electric heaters located at the bottom of the vessel, which boil a portion of the water to generate steam. Pressure is reduced by spraying relatively cool water into the steam space, causing condensation.

The pressuriser responds automatically to routine operational changes such as start-up, shutdown, and load following, and plays an important role during abnormal conditions by maintaining pressure within design limits.

Key implications: The pressuriser ensures that primary coolant remains liquid, preventing boiling in the reactor core and protecting fuel cladding. It reduces thermal stress on system components and contributes directly to overall plant safety.

Boiling Water Reactors (BWR)

BWRs do not use a separate pressuriser vessel. Instead, pressure control is achieved directly within the reactor pressure vessel. Steam produced in the core is routed to the turbine, and system pressure is regulated by controlling steam flow and condensation in the main condenser, as well as by safety and relief valves.

While the function of pressure control is still essential, it is integrated into the reactor vessel and balance-of-plant systems rather than performed by a standalone pressuriser.

Key implications: Pressure control is simpler in terms of components but closely linked to turbine and condenser operation. The absence of a separate pressuriser reflects the design choice to allow boiling within the core under controlled conditions.

Pressurised Heavy Water Reactors (PHWR / CANDU)

In PHWRs, pressure control is applied at the level of individual pressure tubes rather than a single large reactor vessel. Each pressure tube contains pressurised heavy water coolant, while a separate low-pressure heavy water moderator surrounds the tubes.

Pressure control is achieved using a pressurising system that includes pressuriser vessels, heaters, and relief devices connected to the primary heat transport system. These systems accommodate thermal expansion and maintain coolant pressure during operation and transients.

Key implications: Pressure control systems are distributed and more complex due to the large number of pressure tubes. The separation of coolant and moderator provides additional safety margins but requires careful pressure management.

High Temperature Gas Cooled Reactors (HTGR)

HTGRs do not use a pressuriser in the conventional sense, as they are cooled by helium gas rather than water. Helium remains in a single phase over the full operating temperature range, eliminating the need to prevent boiling.

System pressure is controlled using gas inventory control systems, including compressors, storage tanks, and valves, which regulate the amount of helium in the system and maintain operating pressure.

Key implications: The absence of a water-based pressuriser simplifies pressure control and removes boiling-related risks. Pressure management focuses on maintaining gas flow and heat removal rather than phase control, supporting inherently stable thermal behaviour.

3.7.5 STEAM GENERATOR

The steam generator is a major heat transfer component in nuclear power plants that separates the nuclear heat source from the electricity producing systems. Its primary function is to transfer heat from the reactor coolant to a secondary water system, producing steam that drives the turbine and generator.

The steam generator provides a physical and functional barrier between radioactive primary coolant and the non-radioactive secondary systems. In doing so, it enables efficient electricity production while maintaining strict separation between nuclear and conventional plant systems.

Across nuclear technologies that use indirect heat cycles, the steam generator performs the same fundamental function: to convert reactor heat into usable steam in a controlled and predictable manner, while maintaining isolation between systems.

Pressurised Water Reactors (PWR)

In PWRs, the steam generator is a large vertical heat exchanger connected directly to the reactor coolant system. Hot pressurised water from the reactor core flows through thousands of inverted U-shaped tubes inside the steam generator. Secondary water flows around the outside of these tubes and boils to produce steam.

The primary and secondary fluids are completely separated by the tube walls. The primary water remains liquid at high pressure, while the secondary water boils at lower pressure. Steam produced on the secondary side is dried, routed to the turbine, and later condensed and returned as feedwater.

Key implications: The steam generator acts as a critical safety barrier, preventing radioactive material from entering the turbine and condenser systems. Its integrity is essential for both plant safety and long-term reliability, and it is designed with conservative margins and extensive inspection programmes.

Boiling Water Reactors (BWR)

BWRs do not use a separate steam generator. Instead, steam is produced directly inside the reactor pressure vessel as water boils in the core. The generated steam is dried and sent directly to the turbine.

Because heat transfer and steam generation occur within the reactor vessel itself, the functions normally performed by a steam generator are integrated into the reactor system.

Key implications: The absence of a steam generator simplifies the plant layout but results in radioactive steam entering the turbine system, which is therefore designed and operated as part of the nuclear island. This design choice reflects a different balance between system simplicity and radiological segregation.

Pressurised Heavy Water Reactors (PHWR / CANDU)

In PHWRs, steam generators are used to transfer heat from the pressurised heavy water coolant circulating through the pressure tubes to a light water secondary system. The steam generators are typically horizontal heat exchangers rather than vertical ones.

Primary heavy water flows through tubes inside the steam generator, while secondary light water boils on the shell side to produce steam for the turbine. As in PWRs, the two systems are fully separated.

Key implications: Steam generators provide the interface between the nuclear heat transport system and conventional power conversion systems. Their horizontal orientation and distributed coolant system reflect the overall CANDU reactor design, while maintaining the same safety function of system separation.

High Temperature Gas Cooled Reactors (HTGR)

HTGRs use helium gas as coolant and operate at much higher temperatures than water cooled reactors. Heat from the reactor core is transferred either to a steam generator or directly to a gas turbine, depending on the specific design.

In steam cycle HTGR designs, helium passes through a heat exchanger where water is converted to steam for power generation. The steam generator is designed to withstand high temperatures while maintaining complete separation between the helium and water systems.

Key implications: The steam generator must accommodate higher temperatures and different material challenges than in water cooled reactors. In some HTGR designs, the option to eliminate steam generation altogether further reduces system complexity and water related risks.

3.7.6 TURBINE

The turbine is a central component of the power conversion system in a nuclear power plant. Its primary function is to convert the thermal energy of steam or hot gas into mechanical energy, which is then used to drive an electrical generator. While the reactor produces heat, it is the turbine that enables that energy to be transformed into usable electricity.

The turbine operates entirely outside the reactor core and does not play a role in controlling the nuclear reaction. However, its performance and reliability are essential to overall plant efficiency, availability, and safe operation.

Pressurised Water Reactors (PWR)

In PWRs, the turbine is driven by steam produced in the steam generators on the secondary side of the plant. This steam is non-radioactive and is routed through high-pressure and low-pressure turbine stages to maximise energy extraction.

After passing through the turbine, the steam is condensed back into water in the condenser and returned to the steam generators as feedwater. The turbine system is part of the conventional power island and is physically separated from the nuclear systems.

Key implications: The separation between nuclear and turbine systems simplifies maintenance and limits radiological exposure. Turbine technology is similar to that used in fossil-fuel power plants, benefiting from extensive industrial experience.

Boiling Water Reactors (BWR)

In BWRs, steam produced directly in the reactor vessel is sent to the turbine without an intermediate steam generator. The turbine therefore operates with steam that contains low levels of radioactivity.

As a result, the turbine, condenser, and associated systems are designed as part of the nuclear island, with additional shielding, monitoring, and operational controls.

Key implications: Direct steam cycle operation simplifies heat transfer but extends radiological controls to the turbine systems.

Pressurised Heavy Water Reactors (PHWR / CANDU)

In PHWRs, the turbine is driven by steam generated in steam generators that transfer heat from the heavy-water primary system to a light-water secondary system. As in PWRs, the steam supplied to the turbine is non-radioactive.

The turbine configuration is typically similar to that of large conventional steam turbines, with multiple stages and moisture separation to improve efficiency.

Key implications: The turbine remains outside the nuclear heat transport system, allowing conventional turbine technology to be used while maintaining strong separation between nuclear and non-nuclear systems.

High Temperature Gas Cooled Reactors (HTGR)

HTGR turbine configurations vary depending on plant design. In steam-cycle HTGRs, helium transfers heat to a steam generator, and the resulting steam drives a conventional turbine. In other designs, helium is expanded directly through a gas turbine in a closed Brayton cycle.

Direct gas turbine designs eliminate the need for steam generation and condensation, while steam-cycle designs retain more familiar turbine technology.

Key implications: Direct gas turbines can improve efficiency and reduce system complexity, while steam turbines offer operational familiarity. In both cases, turbine operation is decoupled from reactor control and benefits from the inherent thermal stability of HTGRs.

3.7.7 CONDENSERS

The condenser is a key component of the power conversion system in a nuclear power plant. Its primary function is to remove heat from exhaust steam leaving the turbine, condensing it back into liquid water so that it can be reused in the steam cycle. By maintaining a low pressure at the turbine exhaust, the condenser also improves turbine efficiency and overall plant performance.

The condenser does not interact directly with the reactor or nuclear fuel. However, it plays an essential supporting role by enabling continuous, efficient operation of the turbine and by closing the steam-water cycle.

Pressurised Water Reactors (PWR)

In PWRs, the condenser receives non-radioactive steam exhausted from the turbine. The steam flows over tubes carrying cooling water from an external heat sink, condensing on the tube surfaces and collecting at the bottom of the condenser as condensate.

The condensed water is then pumped through feedwater heaters and returned to the steam generators. The condenser is part of the conventional power island and is physically separated from nuclear systems.

Key implications: The condenser enables high turbine efficiency while remaining free of radioactive contamination under normal operation. This allows conventional materials, maintenance practices, and environmental discharge controls to be used.

Boiling Water Reactors (BWR)

In BWRs, steam produced directly in the reactor vessel is expanded through the turbine and then condensed in the condenser. As a result, the condenser and associated systems may contain low levels of radioactivity.

The condenser design is similar in principle to that used in PWRs but incorporates additional monitoring and operational controls to manage radiological considerations.

Key implications: The condenser forms part of the nuclear island and is designed to safely manage radioactive steam and condensate.

Pressurised Heavy Water Reactors (PHWR / CANDU)

In PHWRs, the condenser receives steam generated in the steam generators, which transfer heat from the heavy water primary system to a light water secondary system. The steam entering the condenser is nonradioactive.

The condenser operates in conjunction with large multi-stage turbines and is designed to handle high steam flow rates typical of CANDU plants.

Key implications: As with PWRs, the condenser is part of the conventional power island. Its reliable operation supports efficient heat rejection and continuous reuse of feedwater, contributing to plant availability and performance.

High Temperature Gas Cooled Reactors (HTGR)

Condenser requirements in HTGRs depend on the plant configuration. In steam cycle HTGRs, a conventional condenser is used to condense steam after it exits the turbine, similar to other steam based nuclear plants.

In HTGR designs that use a direct gas turbine cycle, a condenser is not required, as the working fluid remains in the gas phase and heat rejection occurs through alternative cooling systems.

Key implications: Where present, the condenser performs a familiar and well understood function. Where eliminated, overall system complexity and water usage may be reduced, reflecting the flexibility of HTGR designs.

3.7.8 ELECTRICITY GENERATION

The steam turbine drives a generator, which converts the rotational energy of the turbine shaft into electrical energy. The principle underlying this process is electromagnetic induction. When a magnetic field moves past a conducting coil, an electrical voltage is produced in the coil, causing a current to flow in a connected conductor circuit. The electricity generated by the turbine generator set is stepped up via transformers and fed into the off-site grid via high voltage switch gear, housed in the high voltage yard.

3.8 KOEBERG'S OPERATING MODEL²²

Koeberg operates using three distinct water systems, each serving a specific function in the plant's thermodynamic and cooling processes. These systems are collectively referred to as coolant systems, although in other reactor designs, gases such as helium or carbon dioxide may be used instead. The separation of these systems is critical to safety and environmental protection, as it ensures that the radioactive water circulating within the reactor core remains isolated from the other systems, thereby preventing cross-contamination.

The primary system is a closed-loop circuit that transfers heat from the nuclear fuel in the reactor core to the steam generators. Koeberg employs a three-loop configuration, where pressurised water circulates through the reactor and steam generator tubes, absorbing heat and returning via reactor coolant pumps. This system is maintained under high pressure by a pressuriser, which prevents the water from boiling despite the elevated temperatures. The integrity of this closed system ensures that radioactive water does not interact with the secondary or tertiary systems.

The secondary system is also closed and functions to convert thermal energy into mechanical energy. Water is pumped into the steam generators, where it absorbs heat from the primary system and boils into steam. This steam drives one high-pressure turbine and three low-pressure turbines, which in turn power a generator producing approximately 921 MW of electricity. After passing through the turbines, the steam is condensed back into water in the condensers and recirculated to the steam generators, completing the cycle.

The tertiary system is an open-loop cooling system that uses seawater to condense steam in the secondary system. Seawater is drawn from the Atlantic Ocean at a rate of approximately 80 tons per second and circulated through the condensers to absorb residual heat from the steam. Once the cooling process is complete, the warmed seawater is discharged back into the ocean through the outfall structure, under regulated conditions to minimise thermal impact on the marine environment. This is illustrated in Figure 3-3.

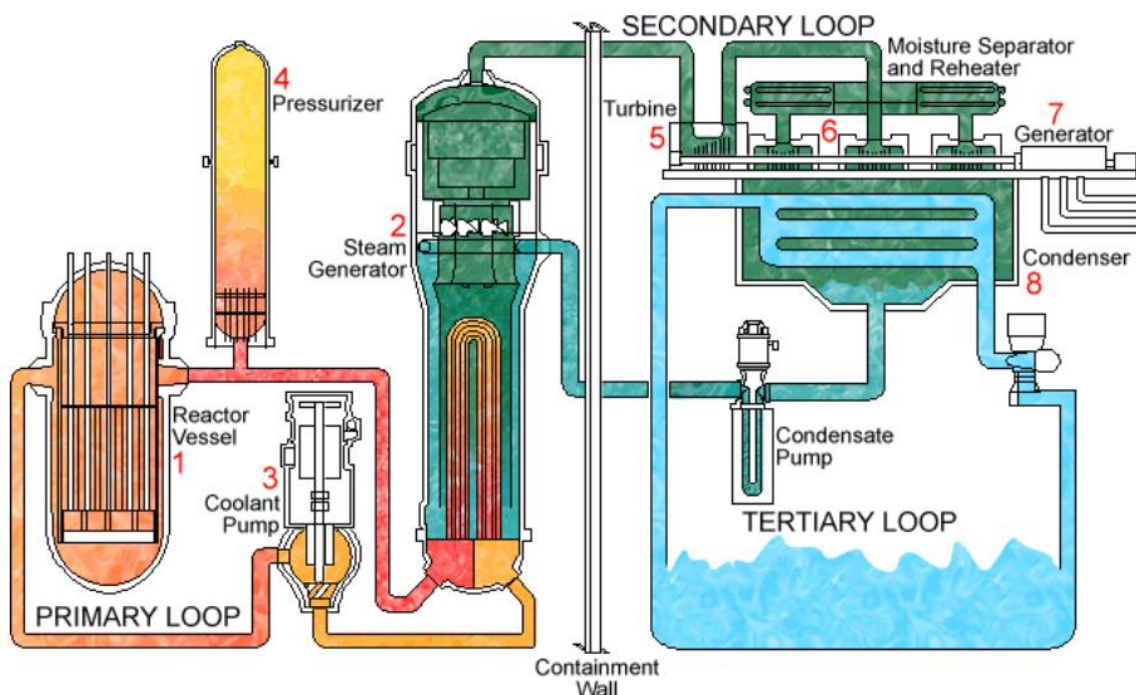


Figure 3-3 – Operating Model at Koeberg²²

²² Eskom. Operating Model. Available at: <https://www.eskom.co.za/koeberg-operating-model/>.

3.9 RADIATION^{23,24,25,26}

Radiation is the process whereby certain atoms emit energy in the form of electromagnetic waves or particles in order to become more stable, called radioactive decay. Although the term “radiation” is very broad and includes such things as microwaves, light, heat, radio waves and x-rays, all part of the electromagnetic spectrum, it is most often used to mean “ionising” radiation, particularly in nuclear terms. This refers to the radiation that can produce charged particles (“ions”) in both inanimate and living matter, as it contains sufficient energy to remove electrons from the atoms within the material it penetrates, which is what renders this type of radiation potentially harmful to life. Ionisation has the potential to break chemical bonds, which may then form other bonds that may, in the instance of the human body, be harmful. This depends on the duration and intensity of exposure. Radioactive materials can only become hazardous if they escape into the atmosphere.

Not all of the atoms of a radioactive isotope decay at the same time. Instead, the atoms decay at a rate that is characteristic to the isotope. The rate of decay is a fixed rate called a half-life. The half-life of a radioactive isotope refers to the amount of time required for half of a quantity of a radioactive isotope to decay. For example, carbon-14 has a half-life of 5 730 years, which means that if you take one gram of carbon-14, half of it will decay in 5 730 years. Different isotopes have different half-lives. Radioactive decay is random; it cannot be told which atoms in an isotope sample will decay. But it is also predictable and exponential, so how long it will take for a sample to completely decay based on its half-life can be determined.

As depicted in Figure 3-4, the types of radiation are detailed in Table 3-4.

Table 3-4 – Radiation Types^{23,24}

RADIATION TYPE	DESCRIPTION
Alpha particles (α)	Typically heavy, positively charged particles that are emitted from naturally occurring elements such as uranium and radium, as well as man-made elements, travel very short distances even when discharged to air. Although they are intensely ionising, they cannot penetrate the skin and are therefore only harmful if ingested or inhaled.
Beta particles (β)	These consist of negatively charged particles – fast moving electrons that are emitted by radioactive elements. These particles are smaller but more penetrating than alpha particles but can easily be shielded by very thin materials. Contamination to human skin could pose a risk. A sheet of aluminium a few millimetres thick can stop beta radiation.
Gamma rays (γ)	Contain very high energy levels, similar in character to the waves of light. Gamma rays can travel great distances through the air and are very penetrating, requiring shielding in the workplace. Thick concrete or metal (lead) plating can stop gamma rays, which pose a health problem whether they are within or outside the body.

²³ Department of Minerals and Energy (DME). 2005. Understanding Radioactivity and Radiation in Everyday Life. Department of Minerals and Energy. Pretoria

²⁴ Koeberg Nuclear Power Station – General Information Brochure, Eskom Generation

²⁵ NNR, 2022

<https://nnr.co.za/nuclear-energy/>

²⁶ NNR, 2001

X-rays	These rays are not generated by radioactive material but rather by electronic machines (used in medical imaging and industry). X-rays pass right through the body.
Neutrons	These are primarily released by the process of nuclear fission within a nuclear reactor and therefore do not pose a risk outside nuclear plants. This radiation can be very destructive to human tissue as it is highly penetrating. Efficient shielding against neutrons can be provided by, for example, water.

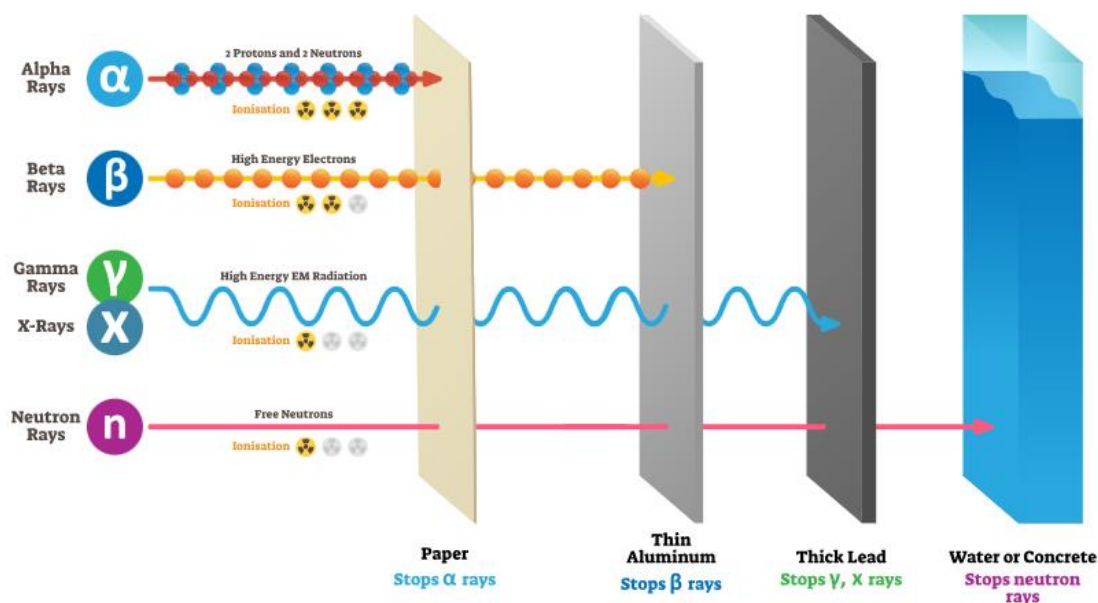


Figure 3-4 – Types of Radiation (NNR, 2022)

There are natural and man-made/ technological sources of ionising radiation, as highlighted in Table 3-5.

Table 3-5 – Ionising Radiation Sources

NATURAL SOURCES	MAN-MADE/ TECHNOLOGICAL SOURCES
Radon-222(²²² Rn) & Thoron-220(²²⁰ Rn): Radioactive gases originating from uranium and thorium in soil and rocks.	Nuclear Fuel Cycle: mining, milling, processing, and enrichment of uranium.
Cosmic Radiation: Higher levels at higher altitudes.	Nuclear Medicine: use of isotopes for diagnosis (e.g., PET scans) and therapy (cancer treatment).
Terrestrial Radiation: Naturally occurring radioactive materials (NORM) found in rock and soil.	Industrial Applications: radioactive sources used in non-destructive testing (NDT), mining, and radiography.
	Electronic Products: x-ray equipment, linear accelerators, and cyclotrons.

Humans have always been subjected to natural radiation from the sun and outer space (cosmic rays) and naturally occurring radiation elements are ingested by means of food and water, or by inhalation. Radiation is also emitted by ground, soil and rocks and naturally varies greatly between locations. These sources are termed natural background radiation. Furthermore, radiation is also used to benefit humans by means of medical X-rays, in the treatment of cancers and in preserving

fresh produce. The altitude at which one lives and the type of rocks that surround us determine the amount of background radiation that one receives. Studies have shown that even brick houses and the ground we walk on are slightly radioactive because of the type of minerals they contain. Natural sources of radiation are found in plants and animals as well as the human body.

Man-made sources of radiation are present in mechanical and dental sources, including X-rays, medical diagnoses and treatment. Radiation may even be found in smoke detectors, television sets, emissions from coal-fired power plants and NPPs. In NPPs, uranium fuel becomes very radioactive as the reactor produces heat. However, during normal operation of a NPP, very low amounts of radionuclides are discharged into the atmosphere and surface water bodies. The type and quantity of radionuclides that nuclear facilities discharge depend on the reactor's design and must ensure that the discharges will result in a dose below the internationally accepted safety limit of 1 millisievert (mSv) per person per year (pp/py), as laid out in the International Atomic Energy Agency's (IAEA) Safety Standards²⁷.

The global average public exposure by radiation sources—rounded estimates of the effective dose to a person in a year—is depicted in Figure 3-5.

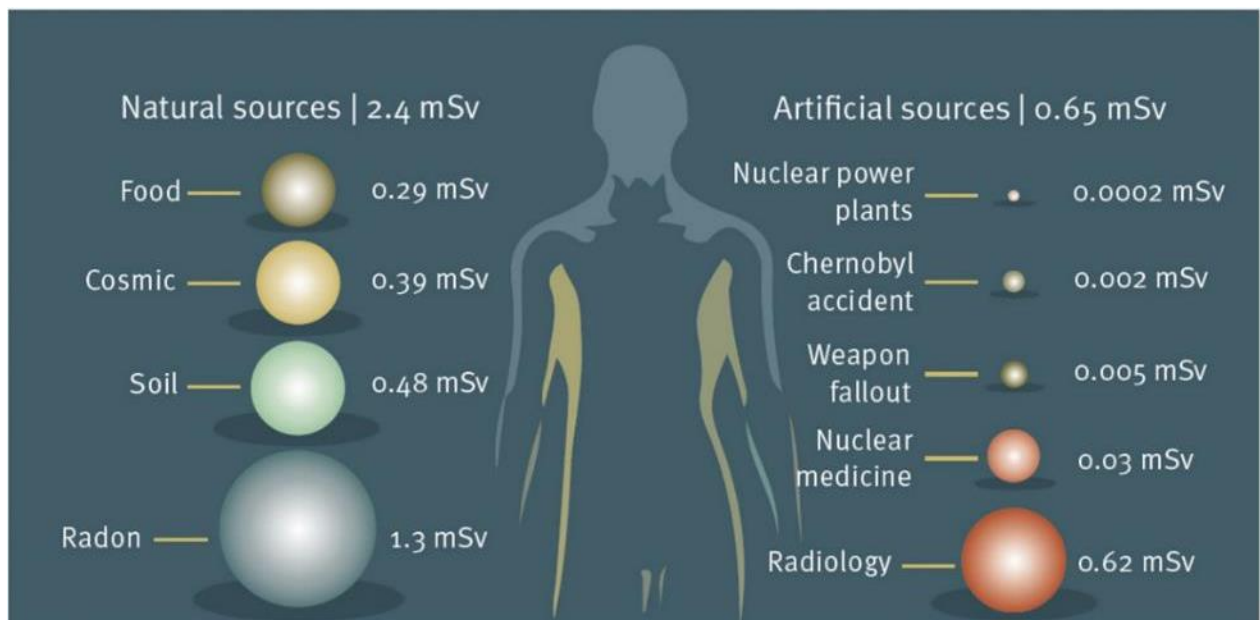


Figure 3-5 – Average Public Exposure by Radiation Sources²⁷

3.10 SAFETY OF NUCLEAR POWER PLANTS⁹⁰

Since the commercial production of nuclear energy to generate electricity, the technology has been developed with safety as a central consideration in its design, construction and operation. NPPs incorporate multiple systems that continuously monitor, control and support reactor performance.

²⁷ Helwig, J. (2025). Nuclear Data: Modelling the Future, Vol. 66-1. Available: <https://www.iaea.org/bulletin/understanding-radioactive-discharges#:~:text=During%20normal%20operation%20of%20a,remain%20below%20the%20safe%20limit.>

These systems are designed to ensure reliable operation and to minimise the likelihood of any release of radioactivity into the environment. The emphasis on rigorous safety measures reflects international standards and regulatory requirements, which guide the ongoing management of nuclear facilities.

The design of a NPP incorporates many physical barriers that protect against the accidental release of the nuclear fuel, which becomes both hot and radioactive during its use. These barriers include the ceramic form of the fuel pellets; the metal encasing the fuel pins; the reactor vessel with some 25 cm thick walls of steel; and a containment building with a lining of steel and walls of reinforced concrete. The decades-long tests and analysis programmes showed that less radioactivity escapes from molten fuel than initially assumed, and that this radioactive material is not readily mobilised beyond the immediate internal structure. Thus, even if the containment structure that surrounds all modern nuclear plants were ruptured, it would still be highly effective in preventing escape of radioactivity.

There are numerous safety systems that have been engineered to assist in preventing an accident with the reactor or to lessen the effects in the event that an accident should occur. All critical safety systems have backup systems that duplicate the jobs that the system is supposed to perform. An example of such a backup system would be the large stainless steel pipes about 600 mm in diameter, which carry water to the reactor core, where it cools the fuel. Should these fail for some reason there are a number of other independent emergency cooling systems included in the design of the plant that can provide the necessary cooling.

Another key aspect to consider when looking into the safety of a NPP is the training and preparedness to which the people who operate these stations are exposed. For example, reactor operators are trained and tested on the procedures of power plant operation, and in order to train such staff, utilities around the world use sophisticated power plant simulators, which are replicas of the control room of the real power plant in which they will be working. The simulators are computer controlled, allowing the operators to gain practical experience in managing all types of normal and unusual occurrences without posing any danger to the public or the environment.

The nuclear industry throughout the world has rigid safety standards. In South Africa these standards are set and regulated by the NNR, and Eskom would have to prove to the NNR that the proposed NPP can and will meet these stringent safety standards. This is done through a Nuclear Installation Site Licence (NISL) application which is an early-stage regulatory process that enables an applicant to seek approval for a specific site intended to host a future nuclear installation, even if the precise technology or reactor design has not yet been finalised. Governed by the National Nuclear Regulator Act, 1999 (Act No. 47 of 1999) (NNRA) and the associated Siting Regulations (R 927), the application requires submission of a detailed Site Safety Report (SSR). This report evaluates critical environmental and safety factors—including seismic stability, population distribution, and meteorological conditions—to demonstrate that the proposed site can safely accommodate a nuclear facility. Once the application is accepted for review, it initiates a mandatory public participation process. This includes formal public notices and hearings, ensuring that stakeholders and affected communities have the opportunity to provide input. If granted, the NISL authorises only limited “site establishment” activities, such as land clearing or the construction of temporary support infrastructure. Importantly, the licence does not permit the commencement of nuclear installation construction itself but rather establishes the regulatory and environmental

foundation for potential future development. During operation, periodic inspections also ensure that each facility operates safely.

3.10.1 **NUCLEAR INCIDENTS AND ACCIDENTS²⁷**

It is a misconception amongst the general public that a nuclear reactor can explode as an atomic bomb. This cannot happen, as a nuclear explosion requires a very high concentration of fissionable uranium, which is not the type of uranium that is used within a NPP. The uranium used in NPP is enriched below 5%, whereas an atomic bomb using uranium is enriched to above 90%.

The International Atomic Energy Agency (IAEA) has developed a scale called the International Nuclear Event Scale (INES), which they use to rate the severity of a nuclear accident on a scale from 0 to 7. Each increase in level indicates an event that is about ten times more severe than the previous level. Levels 1–3 are defined as “incidents” and levels 4–7 are defined as “accidents”; events with no safety significance are Below Scale / Level 0. Each level is defined as follows:

- **Level 0 — Below Scale / Deviation (No safety significance)** - No safety significance from a nuclear/radiological protection perspective (i.e., it does not indicate a meaningful degradation in safety).
- **Level 1 — Anomaly** - Minor problem with safety components or procedures, but significant defence-in-depth remains (i.e., safety margins are still robust). [iaea.org], [aerb.gov.in], [aerb.gov.in]
- **Level 2 — Incident** - An event with significant failures in safety provisions, or radiological consequences such as exposure above statutory annual limits for workers / above specified thresholds for the public, or significant contamination within the facility (typically without major off-site consequences). [aerb.gov.in], [aerb.gov.in]
- **Level 3 — Serious incident** - A serious event such as a near-accident, a lost/stolen highly radioactive sealed source, high dose rates in an operating area, or severe contamination in areas not expected by design, generally with a low probability of significant public exposure.
- **Level 4 — Accident with local consequences** - An accident with local consequences, such as fuel melt/fuel damage or a minor release of radioactive material that is unlikely to require broad countermeasures beyond local controls (e.g., limited food controls).
- **Level 5 — Accident with wider consequences** - An accident with wider consequences, such as severe damage to the reactor core and/or a limited off-site release likely to require implementation of some planned countermeasures.
- **Level 6 — Serious accident** - A significant release of radioactive material that is likely to require implementation of planned countermeasures.
- **Level 7 — Major accident** - A major release of radioactive material with widespread health and environmental effects, requiring planned and extended countermeasures

Across the full history of nuclear events classified using the INES scale approximately 20 – 25 level 4 – 7 events have been recorded. Approximately 20 of these were recorded between the 1950s and the 1980s. However, only 4 additional level 4 – 7 accidents have been recorded since 1987 with the last recorded in 2011. These are the only major accidents to have occurred in over 14 500 cumulative reactor-years of commercial nuclear power operation in 32 countries. Table 3-6 provides a comparison of the 5 to 7 accidents —highlighting their causes, impacts, and lessons learned.

Table 3-6 – Three Major Nuclear Incidents^{28,29,30}

ACCIDENT	YEAR & LOCATION	CAUSE/ TRIGGER	SEVERITY (INES LEVEL)	IMMEDIATE IMPACTS	LONG-TERM IMPACTS	KEY LESSONS LEARNED
<u>Kyshtym / Mayak</u>	1957, Mayak (USSR, now Russia)	Failure of high-level radioactive waste cooling system leading to overheating and chemical explosion in a storage tank	Level 6 (serious accident)	Massive release of radioactive material (no initial public disclosure); ~10,000 people evacuated; Widespread contamination over ~50,000 km²	Long-term environmental contamination (East Urals Radioactive Trace); Chronic health impacts in exposed populations; Ongoing land-use restrictions	Critical importance of waste management and cooling systems; Need for transparency and emergency preparedness; Strengthening of radiological monitoring systems
<u>Windscale fire</u>	1957, Sellafield (UK)	Graphite reactor fire caused by improper annealing procedure during plutonium production	Level 5 (Accident with wider consequences)	Release of radioactive iodine (I-131) into the atmosphere; Milk contamination and large-scale food restrictions; No immediate fatalities	Increased cancer risk (notably thyroid cancer); Lasting contamination in surrounding areas; Long-term changes to reactor operations	Importance of reactor design safety (temperature monitoring and control); Need for independent regulatory oversight; Establishment of more rigorous off-site emergency response and food safety controls
<u>Three Mile Island</u>	1979, Pennsylvania, USA	Equipment malfunction combined with operator error leading to partial core meltdown	Level 5 (Accident with wider consequences)	No immediate deaths; minor radiological release; precautionary evacuation advisories	Strengthened U.S. nuclear regulation; decline in public confidence in nuclear power	Importance of operator training, human factors, and improved instrumentation

²⁸ International Atomic Energy Agency (IAEA) (2024) Nuclear Safety and Major Accidents. IAEA. Available at: <https://www.iaea.org/topics/nuclear-safety-and-security>.

²⁹ World Nuclear Association (2024) Safety of Nuclear Power Reactors. World Nuclear Association. Available at: <https://world-nuclear.org/information-library/safety-and-security/safety-of-nuclear-power-reactors.aspx>.

³⁰ U.S. Nuclear Regulatory Commission (NRC) (2023) Background on the Three Mile Island Accident. NRC. Available at: <https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html>.

ACCIDENT	YEAR & LOCATION	CAUSE/ TRIGGER	SEVERITY (INES LEVEL)	IMMEDIATE IMPACTS	LONG-TERM IMPACTS	KEY LESSONS LEARNED
Chernobyl	1986, Pripyat, USSR	Flawed reactor design and unsafe safety test leading to uncontrolled power surge	Level 7 (Major accident)	31 immediate deaths; massive radioactive release; large-scale evacuation	Long-term health effects (thyroid cancers, radiation sickness); exclusion zone still in place	Need for robust reactor design, transparent safety culture, and international cooperation
<u>Goiânia accident</u>	<u>1987, Goiânia (Brazil)</u>	<u>Orphaned medical radiotherapy source (Cs-137) dismantled and handled by public after abandonment of facility</u>	<u>Level 5 (Accident with wider consequences)</u>	<u>Severe radiation exposure to public - 4 deaths from acute radiation syndrome; Widespread contamination of homes and urban areas; Panic and large-scale emergency response</u>	<u>Long-term health monitoring of exposed individuals; Psychological and social impacts (stigma and displacement); Decontamination of large urban areas</u>	<u>Importance of secure control of radioactive sources; Need for public awareness and education; Strengthening of regulatory control over medical and industrial sources</u>
Fukushima Daiichi	2011, Japan	Earthquake and tsunami disabling cooling systems, leading to core damage in 3 reactors	Level 7 (Major accident)	No immediate radiation deaths; widespread contamination; 150 000 people evacuated	Long-term displacement; costly decontamination; energy policy shifts in Japan and globally	Importance of external hazard assessment, backup power systems, and resilience planning

3.10.2 DEATHS RELATED TO VARIOUS FORMS OF ENERGY PRODUCTION³¹

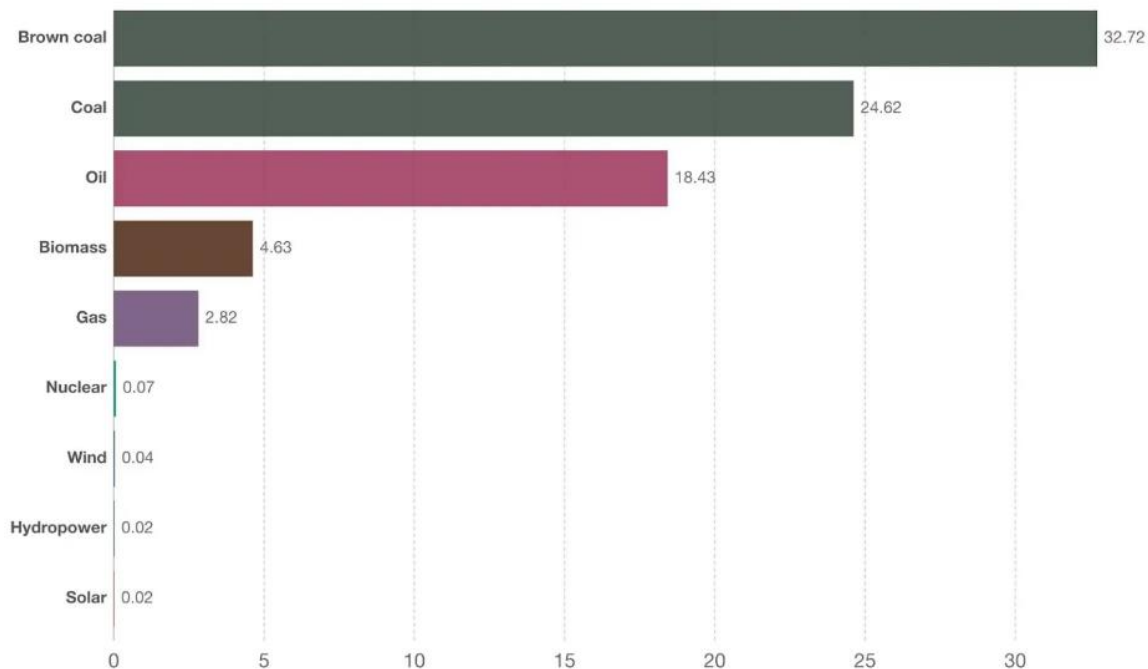
The mortality rate from accidents and air pollution per unit of electricity worldwide, by energy source (in deaths per terawatt-hour) is depicted in Figure 3-6. Accordingly, fossil fuel energy production is the highest cause of energy related deaths, with renewable energy have a lower fatality rate.

³¹ Bove, T. Earth.Org (2021) Nuclear & the Rest: Which Is the Safest Energy Source? Available at: <https://earth.org/nuclear-which-is-the-safest-energy-source/>.

Death rates from energy production per TWh

Death rates are measured based on deaths from accidents and air pollution per terawatt-hour (TWh).

Our World
in Data



Source: Markandya & Wilkinson (2007); Sovacool et al. (2016)

OurWorldInData.org/energy • CC BY

Figure 3-6 – Deaths per Energy Source³¹

3.10.3 NUCLEAR EMERGENCY PLANNING ZONES

All NPPs are required to have emergency plans in the event of a disaster. The proposed new NPP will be no exception. At this stage, the exact delineation of the Emergency Planning Zones (EPZ) is yet to be determined. The extent of the required emergency plan and the EPZ will be determined by the NNR and will be discussed further in the ESIA Report. In order to provide some clarity on the purpose of such zones, the existing Koeberg EPZs are briefly discussed below and, for the purposes of this Scoping Report, it is assumed that the areas associated with the Protective Action Zone (PAZ) and Urgent Protective Zone (UPZ), as defined below, will also apply to the proposed NPP.

The EPZs for Koeberg, for example, are characterised by 5 km and 16 km radii around the site as depicted in Figure 3-7.

The five km radius is referred to as the PAZ and is characterised by the following criteria (NNR, 2005):

- No applications for further development rights for properties falling within or intersecting with this area (either through rezoning, subdivision, departure from land use or council's consent, including application for a guest house or second dwelling), which may result in an increase in the population or transient population), may be approved, unless such a development is place bound. In circumstances where rezoning or subdivision rights are entrenched in the existing property rights, these rights may, however, be exercised; and

- All public in all sectors, i.e. 360° must be evacuated within four hours to designated mass care centres. The evacuation plan must be adequately demonstrated by means of a traffic evacuation model, which must be accepted by the NNR. The EPZ will take the evacuation procedures into account.
- The cumulative impacts (at the Koeberg site) must be assessed.

Developments are accepted within the 5-16 km radius, referred to as the UPZ provided that it meets the following criteria:

- No more than 650 000 people are allowed (NNR 2005/2006); and
- The public can be evacuated to designated mass care centres within a 67.5° sector within 16 hours, which must also be adequately demonstrated by a traffic evacuation model and accepted by the NNR (NNR, 2005).



Figure 3-7 – Koeberg's Exclusion Protection Zones⁹⁰

It is important to note that there are multiple other factors that affect the severity of an emergency (e.g. the nature of the accident, the size of the radiation “cloud”, prevailing wind direction, rainfall and topography).

3.10.4 NUCLEAR PROLIFERATION^{7,32,33,34}

Nuclear proliferation is the spread of nuclear weapons, related technology, and fissile materials to countries not recognised as nuclear-weapon states under the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT). While the IAEA monitors civil nuclear programmes to ensure they remain peaceful, the global non-proliferation regime is currently under severe strain. The New START Treaty (Strategic Arms Reduction Treaty) was a bilateral arms control agreement between the United States and Russia, signed in Prague on 8 April 2010. It entered into force on 5 February 2011 and replaced the earlier START I treaty (1991) and the Strategic Offensive Reductions Treaty (SORT, 2002). The treaty placed verifiable limits on deployed strategic nuclear warheads and delivery systems, capping each side at 1 550 deployed warheads, 700 deployed intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and heavy bombers, and 800 total launchers (deployed and non-deployed). It also established a robust verification regime, including on-site inspections, data exchanges, and notifications, to build transparency and trust between the two nuclear powers.

The treaty was extended in 2021 for five years, but it expired on 5 February 2026 without a replacement agreement. Its expiration marks the end of the last remaining nuclear arms control treaty between the United States and Russia, raising concerns about a potential new arms race and the erosion of decades of nuclear stability. This has the potential of triggering a new “unconstrained” arms race that includes China's rapid expansion.

Several states/countries did not sign the treaty and were able to use international nuclear technology (often procured for civilian purposes) to develop nuclear weapons. Such countries include but are not limited to India, Pakistan and Israel. South Africa acceded to the treaty on 21 January 1999. Of the countries that have signed the treaty and received shipments of nuclear paraphernalia, many states have been accused of attempting to use supposedly civilian NPP for developing weapons. Based on the fact that some types of reactors (such as possible future fast breeder reactors) are more conducive to producing material that may be used more readily for the manufacture of nuclear weapons when compared with other reactors, a number of international disputes have resulted over proliferation on the specific model of reactor being contracted within a country suspected of nuclear weapon ambitions.

³² U.S. Department of State (2024) New START Treaty. U.S. Department of State, Bureau of Arms Control, Verification and Compliance. Available at: <https://www.state.gov/new-start/>.

³³ Arms Control Association (2025) The New START Treaty at a Glance. Arms Control Association. Available at: <https://www.armscontrol.org/factsheets/NewSTART>.

³⁴ International Atomic Energy Agency (IAEA) (2023) Nuclear Arms Control and Disarmament: Overview of Treaties. IAEA. Available at: <https://www.iaea.org/topics/nuclear-arms-control-and-disarmament>.

3.10.5 OCCUPATIONAL EXPOSURE^{35,36}

In South Africa, the regulatory limit for occupational exposure to ionising radiation is primarily governed by the NNR. Government Notice No. R. 388 on 28 April 2006 (Government Gazette No. 28755), sets out the Regulations on Safety Standards and Regulatory Practices in terms of the NNRA, 1999 (Act No. 47 of 1999). The South African Health Products Regulatory Authority (SAHPRA) stipulates that radiation workers must not exceed an effective dose of 20 millisieverts (mSv) per year, averaged over five consecutive years, with no single year exceeding 50 mSv. These limits are aligned with international standards set by the International Commission on Radiological Protection (ICRP) to ensure worker safety while allowing for controlled use of radiation in medical, industrial, and research contexts.

For the year 2005, the Koeberg site achieved an individual dose level of 0.9 mSv, which is substantially lower than the approved limits. The highest individual dose accrued at the Koeberg site was 17.2 mSv. The total annual collective effective dose for workers was 2 260 person-mSv. These figures indicate an increase in the levels from the previous year and is as a result of Koeberg undertaking two refuelling outages during 2005 and only one in the previous year. This shows that the levels at which Eskom currently operates its facilities are within the regulatory limits.

3.10.6 PUBLIC EXPOSURE^{7,37}

In South Africa, the regulatory limit for public exposure to ionising radiation is set by the Department of Health through the Directorate: Radiation Control. The effective dose limit for members of the public is 1 mSv per year, which is consistent with international standards recommended by the ICRP. This limit is designed to protect individuals who are not occupationally exposed to radiation but may encounter it through environmental sources, medical procedures, or proximity to regulated facilities. The regulation ensures that public exposure remains as low as reasonably achievable (ALARA), safeguarding health while allowing for the controlled use of nuclear technologies in medicine, industry, and research.

According to the NNR (2005/2006), various gaseous and liquid effluents are produced during the routine operation of a NPP, however, such substances are treated prior to them entering the environment through dedicated clean up systems. These clean up systems reduce the amount of radioactivity in such substances to well within the specified limits. The risk of public exposure from that portion of radiation that is released to the environment is controlled through the implementation of a radiological effluent management programme. This ensures that the risk that such effluent poses to the public is not significant. One of the key features of this programme, as implemented at Koeberg, is the control of the level of radioactivity in effluent discharges to within the Annual

³⁵ South African Health Products Regulatory Authority (SAHPRA). (2022). Guideline for Radiation Monitoring Requirements and Radiation Occurrences. Available at: https://www.sahpra.org.za/wp-content/uploads/2022/08/SAHPGL-RDN-XR-10_v1-Radiation-Monitoring-Requirements-and-Radiation-Occurrences.pdf.

³⁶ South African Health Products Regulatory Authority (SAHPRA). (2022). Ionizing Radiation Dose Limits and Annual Limits on Intake of Radioactive Material. Available at: https://www.sahpra.org.za/wp-content/uploads/2022/09/SAHPGL-RDN-XR-15_v1-Guideline-for-Ionising-Radiation-Dose-Limits-and-Annual-Limits-on-Intake-of-Radioactive-Material.pdf.

³⁷ Department of Health. (2001). Ionising Radiation Dose Limits and Annual Limits on Intake of Radioactive Material (DLUG91-1). Available at: https://www.sahpra.org.za/wp-content/uploads/2020/01/DLUG91-1_Ionising-radiation-dose-limits-and-annual-limits-on-intake-of-radioactive-material-2.pdf.

Authorised Discharge Quantities (AADQ). Besides these tests and clean up systems radiological surveillance of the environment surrounding the power station is conducted, which ensures that strict control is placed over potential exposure of the public to radioactive releases.

The quantity of radiation exposure and what is absorbed by the body is measured in microSieverts (mSv) per annum. The NNR sets the limit of exposure arising from operations at nuclear installations. The exact radiation exposure, resulting from controlled radiological releases cannot be determined until the final plant is identified. Nevertheless, it is possible to refer to Koeberg's track record in this regard. Hence the dose constraint for Koeberg is set at 1 000 mSv per annum, far below the exposure from natural background radiation (which ranges between 2500 and 3000 mSv per annum), and is aligned with the international standard of 1000 mSv per annum. Koeberg has been in operation for over 40 years. According to the NNR (2005/6), the public exposure to radiation as a result of Koeberg's operations has been less than 20 mSv per annum in general and less than 6 mSv per annum in 2005/6, which is far below the limit set by the NNR.

4 PROJECT DESCRIPTION

4.1 INTRODUCTION AND BACKGROUND

Electricity remains the backbone of modern economies, enabling industrial activity, social development, and technological progress. South Africa, however, faces persistent challenges in securing reliable electricity supply.

Eskom Holdings SOC Limited (Eskom) is South Africa's primary electricity provider, responsible for generating, transmitting, and distributing about 95% of the nation's power. Coal continues to dominate South Africa's generation mix, providing dependable baseload power but largely contributes to GHG emissions and environmental impacts. Renewable energy sources such as wind and solar have expanded rapidly, offering clean alternatives but remaining variable and weather dependent—not providing baseload power. Hydropower is efficient but geographically limited. Natural gas provides flexibility and rapid dispatch capability, yet it still emits GHGs. Nuclear energy, represented by Koeberg Nuclear Power Station (Koeberg), contributing around 5% of the national electricity mix, has demonstrated its ability to deliver stable, low carbon baseload power for more than four decades with limited environmental impacts. Despite each energy option having drawbacks, together they form a complementary energy mix that can deliver secure, affordable, and sustainable electricity for South Africa's long-term development.

The Nuclear Energy Policy (2008) set out a framework for the peaceful use of nuclear technology, highlighting its role in reducing GHG emissions and ensuring energy security. Principle P1 of the policy commits nuclear energy to diversification of primary energy sources, while Principle P3 positions nuclear as a strategic tool for climate change mitigation.

Internationally, South Africa has pledged to align with global climate goals, including pathways toward net zero emissions. NDP 2030 emphasises a diversified, secure, and sustainable energy mix, calling for thorough investigation into nuclear's costs, safety, and benefits. More recently, the Integrated Resource Plan (IRP 2025) reframed nuclear within a broader JET Strategy, alongside renewables and emerging technologies such as green hydrogen. The IRP envisages the introduction of 5 200 MW of new nuclear capacity by 2039, with consideration of up to 10 000 MW depending on the development of a Nuclear Industrialisation Plan. This is discussed in greater detail in Chapter 5.

South Africa hosts eight known uranium deposit types, including quartz-pebble conglomerates in the Witwatersrand Basin, sandstone deposits in the Karoo Uranium Province, carbonaceous shale and coal deposits in the Springbok Flats Basin, surficial deposits in Namaqualand, intrusive-hosted deposits in Phalaborwa, granite-related deposits in Namaqualand, and phosphorite deposits in marine areas. Of these, the most significant contributors to the country's uranium resource inventory are quartz-pebble conglomerates, sandstones, coal, carbonaceous shales, and surficial deposits³⁸.

³⁸ Kenan, A., and Chirenje, E. (2014). Uranium in South Africa: Exploration, mining and production. IAEA-CN-216 Abstract 239.

Currently, the Witwatersrand Basin is the only site with active uranium mining, where uranium is recovered as a by-product of gold operations³⁸. South Africa's uranium industry began in 1952, peaking in the early 1980s at over 6 000 tonnes annually. By 2013, production had declined to below 500 tonnes per year. Since 2020, South Africa has seen a decrease in uranium production, with an average of 200 tonnes per year³⁹.

Present at an average crustal abundance of approximately 4 ppm, uranium is more common than gold and silver and is the heaviest naturally occurring element. One kilogram of uranium when fully fissioned yields an energy output equivalent to roughly three million kilograms of coal.

By integrating nuclear with renewables, gas, and other sources, South Africa can achieve a balanced, resilient, and sustainable energy portfolio. Eskom is committed to secure an energy future which aligns with the national planning priorities to diversify and stabilise electricity supply.

On 11 October 2017, the DFFE granted Environmental Authorisation (EA) for the construction, operation, and decommissioning of the proposed Nuclear 1 power station, authorising the development of a nuclear generation facility of up to 4 000 MW at the Duynefontyn site in the Western Cape. Subsequent appeals lodged against the 2017 EA were considered through the prescribed statutory appeal process. The Minister of Forestry, Fisheries and the Environment issued a final appeal decision on 29 July 2025, dismissing all appeals and thereby upholding the original 2017 EA in full (A court review application has been submitted by SAFCI, Earthlife Africa and Greenpeace).

Eskom further proposes to develop another NPP and associated infrastructure, with an installed generating capacity of up to 5 200 MW. The proposed sites that are being considered are Thyspunt or Bantamsklip, as described in the location section below.

Eskom appointed WSP Group Africa (Pty) Ltd (WSP) as the independent Environmental Assessment Practitioners (EAP) to conduct a S&EIR process with an associated Environmental and Social Management Plan (ESMP) for the proposed NPP project. The S&EIR process will be aligned with international standards.

4.1.1 DEFINING BATTERY LIMITS⁴⁰

This Scoping Report applies the concept of battery limits to clearly define the scope of activities and infrastructure assessed as part of the proposed Nuclear Power Plant (NPP), with the assessment boundary anchored to the activities applied for as listed or specified activities in accordance with the National Environmental Management Act, 1998 (NEMA) and the EIA Regulations, 2014 (as amended).

³⁹ World Nuclear Association. (2026). Nuclear Fuel Cycle – World Uranium Mining Production. Available at: <https://world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production>.

⁴⁰ A battery limit is defined as the physical or functional boundary that defines where the responsibility, scope, and interfaces of a project begin and end.

The battery limits establish the spatial and operational boundaries of the proposed development for which environmental authorisation is sought, while ensuring that all associated and enabling activities that may influence environmental decision making are transparently identified.

For the purposes of this Scoping Report, the battery limits are defined as all construction, operational, waste management, and decommissioning activities located within the demarcated and access-controlled nuclear site boundary, corresponding with the proposed Nuclear Installation Site as defined for National Nuclear Regulator (NNR) licensing purposes.

The battery limits therefore represent the physical footprint and operational envelope of the nuclear power plant facility itself, from site establishment through to decommissioning.

The project description below covers both activities within the site boundaries as well as such enabling activities that are considered that may influence decision-making.

4.1.2 ACTIVITIES INCLUDED WITHIN THE BATTERY LIMITS

The following activities and infrastructure are located within the nuclear site boundary and fall within the scope of this Scoping Report and the subsequent Environmental Impact Assessment (EIA).

4.1.2.1 Site Establishment and Construction

- Vegetation clearance, earthworks, and platform preparation within the site
- Construction of nuclear and non-nuclear buildings, including:
 - Nuclear Island
 - Reactor building(s) and containment structures
 - Spent Fuel Pool
 - Fuel handling and auxiliary buildings
 - Electrical building
 - Control room
 - Emergency Diesel Generators
 - Essential Cooling water systems
 - Conventional Island
 - Turbine hall(s) and conventional island infrastructure
 - Steam feed system
 - Condenser
 - Generator
 - Power Evacuation systems
 - Cooling water systems
 - Emergency facilities, and security buildings
 - Balance of Plant
 - Intake and Outtake system
 - Chlorination plant
 - Alternative heat sink
 - Sewage system
 - Electrical supply
 - Information and Communication Technology
 - Waste storage Facilities
 - Chemistry

- Establishment of construction laydown areas, batching plants, workshops, and temporary facilities located on site
- Construction of internal access roads, stormwater infrastructure, site security fencing; terracing; excavations; trenching (pipes); sewage treatment; facilities; desalination plant; water tankers; meteorological station etc.

4.1.2.2 Nuclear Installation and Power Generation Facilities

The following Nuclear Installation components are included within the battery limits:

- Reactor systems and safety-related systems
- Reactor coolant and heat transfer systems
- Containment structures and engineered safety features
- Instrumentation, control, and protection systems

The non-nuclear, power generation side, including turbines, generators, and associated plant located within the site boundary and functionally integrated with the nuclear installation, is also included.

4.1.2.3 Nuclear Fuel Management (On-site)

Activities within the battery limits include:

- Receipt and handling of fresh nuclear fuel on site
- On-site fuel storage and handling systems
- SNF management, including:
 - Spent fuel pools
 - On-site dry storage
- Associated radiation protection, monitoring, and access control systems

4.1.2.4 Radioactive Waste Management (On-site)

In alignment with NNR radioactive waste classifications, the battery limits include on-site management of:

- Low-Level Radioactive Waste (LLW)
- Intermediate-Level Radioactive Waste (ILW)

This includes:

- Waste segregation, processing, and conditioning
- Temporary and interim storage facilities within the nuclear site
- Radiological monitoring and waste control systems

No off-site waste disposal facilities form part of the project scope.

4.1.2.5 Ancillary and Support Infrastructure (On-site)

The ancillary and support infrastructure located within the site boundary is outlined in Table 4-1.

Table 4-1 – Ancillary and Support Infrastructure associated with the NPP

Item	Infrastructure	Brief Description
1	Access control points	Offices and security check points
2	Access Roads and parking	Vehicle access paths to and on site
3	Administration building for technical staff	Complex which serves the power station
4	Administration building	General Offices
5	Auxiliary cooling towers	Emergency cooling to safety systems
6	Boiler building	External diesel boiler
7	Camera masts	Approximately 40 m high masts to monitor the site
8	Canteen	Cooking and eating facility
9	Central receiving building	Warehouse and stores
10	Chlorination facility	Chemical process plant for production of chlorine
11	Coffer dam	Temporary structure in the surf zone during construction only
12	Containment/Reactor building	A containment building is a steel and/or reinforced concrete structure enclosing a Nuclear Steam Supply System. In an emergency it is the final barrier to a radioactive release.
13	Contractor and construction staff facility complex	Offices, stores and workshops
14	Construction substation	Substation
15	Cooling water Intake basin	Area storing cooling water prior to distribution by the pump houses.
16	Cooling water Intake tunnels	Intake tunnels for delivery of cooling water to the intake canal
17	Cooling water Outlet tunnel	Cooling water pumped through the condensers and other plant via these tunnels into the sea
18	Cooling water pump house	Infrastructure required to deliver cooling water from the intake canal to the condensers and other plant requiring cooling
19	Decontamination Workshops	Workshops which Decontamination of equipment
20	Demineralisation plant and chemical laboratory	Demineralised water production and chemistry laboratory
21	Desalination plant	Desalinisation of sea water and storage thereof to create potable water
22	Diesel building	Houses the emergency diesel generators
23	Diesel and gas storage tanks	Diesel and gas storage
24	Dog kennels	Security
25	Emergency control and support centre	External Control centre for emergencies
26	Eskom buildings	Offices

Item	Infrastructure	Brief Description
27	Estate and horticulture complex	Offices and workshops
28	Fire and Rescue centre and Fire training area	Firefighting facility and coordination centre for emergency action on the site.
29	Fitness for Duty centre	Administration area
30	Floodlight masts	Approximately 30 m high masts to illuminate the site
31	Fuel building	Storage of new and spent fuel (wet and dry storage)
32	Gas storage area	Gas storage
33	Helipad	Designated area for helicopter landing and take-off
34	High level mast lighting	Lighting
35	High voltage yard	High voltage switchgear and associated systems
36	Hydrochloric plant	Acid regeneration plant
37	Hydrogen Plant	Production of hydrogen
38	Laydown areas	Temporary storage areas on site
39	Low and Intermediate Level Waste Storage	Storage area for contaminated waste
40	Meteorological mast and microwave communication towers	120 m and 60 m high steel structure
41	Nuclear auxiliary building	Contains nuclear process equipment associated with the Nuclear Steam Supply System
42	Outfall structure	Discharge point
43	Other security fences	Perimeter fence, security fence around all buildings outside power station security fence and temporary construction fences
44	Parking / Lay down area during construction	Temporary storage of heavy plant during construction and parking during operation
45	Power station security fence	Security fence complying with National Key Point regulations including lighting and cameras
46	Reactor buildings	Houses reactors
47	Safeguard building	A building that contains safety equipment
48	Sewage sump and pump station	Underground sumps with pumps to evacuate sewage
49	Sewage treatment plant	Process plant to treat sewage
50	Skills assessment building	Offices
51	Stacks	Approximately 80 m tall
52	Technical buildings and workshops	Stores and workshops for the repairs of equipment

Item	Infrastructure	Brief Description
53	Training centres	Offices
54	Transformer Area	Contains transformers
55	Turbine hall	Contains the turbines, generator and associated plant
56	Visitor's centre	Information centre
57	Waste building (low and medium)	Temporary storage for low and intermediate level radioactive waste
58	Waste collection areas	Collection area for construction and domestic/hazardous waste
59	Waste water retention basin	Storage and cleaning of storm water runoff drains
60	Water tank	Water storage container
61	Weather station	Offices
62	Workshop and stores	Complex which serves the power station

4.1.2.6 Decommissioning (Strategic Consideration)

Decommissioning is considered at a high-level and limited to activities within the nuclear site boundary, including:

- Decontamination and dismantling of plant structures
- On-site waste handling and interim storage
- Rehabilitation of the nuclear site footprint

Detailed decommissioning plans will be addressed through future regulatory processes.

4.1.3 ACTIVITIES EXCLUDED FROM THE BATTERY LIMITS

The following activities are explicitly excluded from the battery limits and are not authorised through this ESIA:

- External access roads and public road upgrades
- Transmission lines and transmission corridors beyond the on-site HV Yard
- Water use and discharge authorisations, including cooling water abstraction and return flows requiring separate authorisations
- Final disposal facilities for radioactive waste or spent nuclear fuel located off-site
- Off-site construction camps, and material sourcing areas
- Off-site site staff accommodation
- Off-site emergency planning and evacuation infrastructure

These activities are subject to separate environmental authorisations and statutory approvals, where required.

4.1.4 CONSIDERATION OF EXCLUDED ACTIVITIES IN THE SCOPING PROCESS

Although excluded from the battery limits, all associated and enabling activities are identified and described in this Scoping Report, as they may influence the environmental acceptability of the proposed Nuclear Power Plant.

The Scoping Phase therefore identifies:

- Potential impacts arising from on-site and off-site activities
- Key interfaces and dependencies between the nuclear site and external infrastructure
- Environmental issues that require further investigation during the EIA Phase

This approach ensures that the DFFE and stakeholders are informed of the broader development context, while maintaining a clear and legally defensible project scope.

4.1.5 ALIGNMENT WITH NNR LICENSING

The battery limits applied in this Scoping Report are aligned with the proposed NNR Nuclear Installation Site boundary. The EIA informs, but does not replace, the NNR's independent licensing and safety assessment processes, consistent with South Africa's dual regulatory framework for nuclear installations.

4.2 PLANT PARAMETER ENVELOPE⁴³

4.2.1 PLANT PARAMETER ENVELOPE CONTEXT

The NPP project is characterised by extended planning horizons and evolving policy and technology contexts. At the time of this EIA, a decision on the specific design of the plant had not been made yet. Therefore, a Plant Parameter Envelope (PPE) approach will be employed in order to assess the potential environmental impacts of the proposed activity.

The ESIA will be technology neutral, meaning it will use parameters from multiple plant technologies as well as auxiliary infrastructure that are most likely to be deployed on the proposed sites and provide an assessment of the likely effects of the new NPP by using bounding case. This means that none of the individual technology designs and auxiliary infrastructure would have a greater impact on the environment, socio-economic conditions or human health than what is included in the PPE and assessed in the ESIA. This approach provides flexibility for the proposed NPP and future new nuclear deployments. The ESIA assesses the potential impacts associated with these envelope conditions, ensuring that the assessment reflects a worst-case scenario within which any future plant configuration must fall.

The PPE approach is a concept that is used internationally to allow utilities to apply for Early Site Permits (ESP), in situations where the choice of the nuclear technology is unknown. This standard has been developed based on the global operating experience, European Utility Requirements, Nuclear Energy Institute (NEI) guideline and the NEI PPE Worksheet for the development of PPEs.

The PPE values, as contained in this document, are based on the combination of both PWR and SMR designs, and information obtained from various sources such as:

- National Nuclear Regulator (NNR) requirements;
- European Utility Requirements (EUR);
- Other international sources (i.e. the IAEA, the United States Nuclear Regulatory Commission (US NRC), etc.);
- Local information (e.g. SAWS); and
- Global operating data.

Figure 4-1 illustrates the steps followed in defining the PPE. A generic PPE encompasses a wide range of nuclear designs. However, should the selected plant design fall outside of the defined PPE, the impacts shall be identified, and it shall be demonstrated that it is acceptable during further stages of NISL application. It is the objective that the environmental and safety impact of the NPP will

be less than the environmental and safety impact determined by applying the limiting PPE at any specific site.

It must be noted that the final plant designs will be selected post receipt of a decision on this EIA Process. It is recommended that once the final plant design is selected, they will need to be reviewed to ensure that they fit within the PPE as presented in the EIA and aligned with the NISL process. Should any deviations be identified, a Part 2 Amendment Process would then be required.

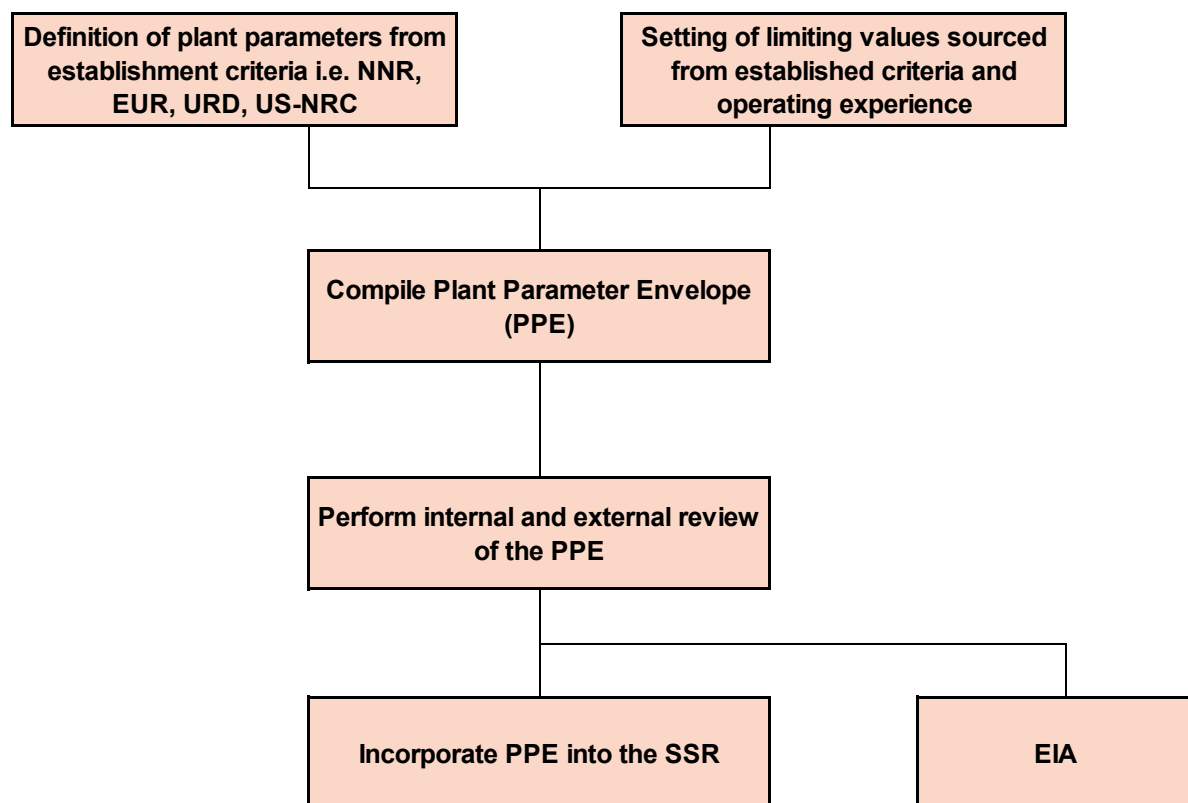


Figure 4-1 – PPE Development Approach

4.2.2 PLANT PARAMETER ENVELOPE FOR PROPOSED NUCLEAR POWER PLANT

Eskom plans to construct and operate a new nuclear installation with a capacity and buildable area footprint⁴¹ as contained in Table 4-2. In line with the Nuclear Energy Policy (DMRE, 2008), it is expected that the proposed development will include multiple units of large conventional PWRs or SMRs of either PWR or HTGR at the proposed site or a mixture thereof (i.e. both Large and Small reactors on the same site).

⁴¹ The buildable area is far in excess of the actual NPP footprint but included within scope of specialist assessments.

Table 4-2 – NPP Location, Capacity and Buildable Area

Aspect	Detail	
Technology	Nuclear	
Total Buildable Area (i.e. likely footprint area)	Thyspunt 250 ha	Bantamsklip 170 ha
Export Capacity	Up to 5 200 MW (subject to finalisation based on generation capacity scenario selection)	

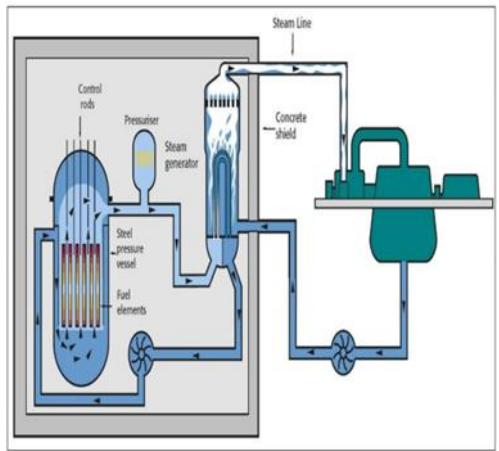
The discussions below provide an overview of the main components associated with the PPE, with a comprehensive PPE table attached as **Appendix K**. The information presented below, with the further detail provided in the comprehensive PPE table (**Appendix K**), forms the basis of the specialist assessments undertaken for inclusion into the ESIA.

4.2.2.1 Reactor⁴²

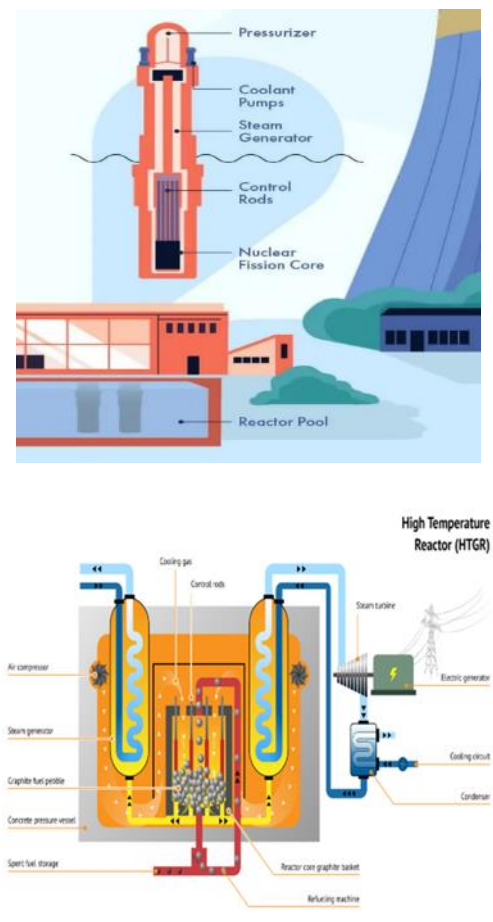
As discussed in Section 3, the reactor serves as the core system where controlled nuclear fission takes place, releasing large amounts of heat energy.

A range and combination of PWRs and SMRs have been identified, with the associated plant envelope parameters detailed in Table 4-3 and Table 4-4. These represent established and emerging designs from leading international vendors and research organisations.

Table 4-3 – Reactor Technology Overview

Large Conventional NPP	Pressurised Water Reactor (PWR) ■ Utilises water as a coolant and moderator. ■ Large PWRs (approximately 1000 MW or larger) are the most used nuclear reactors.	
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⁴² U.S. Department of Energy's Office of Nuclear Energy article NUCLEAR 101: How Does a Nuclear Reactor Work?

Small Modular Reactor (SMRs)	PWR, High Temperature Gas Reactor, etc. ■ A nuclear reactor that produces less than 300 MW of electricity and is designed for factory manufacturing and modular, on-site assembly. ■ This design allows for increased standardisation, shorter construction times, and the ability to scale up power by adding more units as needed. ■ SMRs often incorporate advanced safety features, such as passive cooling, to enhance safety compared to traditional large-scale reactors. ■ Includes High Temperature Gas Reactors (HTGR) which employ gas as a coolant. HTGRs use helium gas and ceramic materials to stabilise the fission process inside the reactor core. They run on ceramic-coated fuel particles and are designed to efficiently produce heat for electricity generation or to drive energy-intensive manufacturing processes, such as hydrogen production.	
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The reactor building is the most distinctive and critical structure. It houses the nuclear reactor and associated systems that contain radioactive materials. The building is designed as a containment structure, typically made of reinforced or prestressed concrete with steel lining to ensure airtightness and watertightness. Its primary function is to act as the ultimate barrier against the release of radiation, protecting both workers and the environment. The reactor building also accommodates safety systems such as emergency cooling and control mechanisms, making it central to the plant's safe operation.

The nuclear auxiliary building supports the reactor by housing essential systems and equipment required for safe and efficient operation. These include ventilation systems, electrical supply units, chemical treatment facilities, and radioactive waste management systems. Auxiliary buildings are designed to ensure that the reactor can function reliably, providing redundancy and backup for critical processes. They play a vital role in maintaining operational safety, as they host monitoring and control equipment that supports reactor performance and emergency preparedness.

The turbine hall is where the mechanical energy generated by steam from the reactor is converted into electrical energy. It contains turbines, generators, moisture separators, and reheaters, all of which are vital to the electricity generation cycle. Turbine halls are typically large, high-ceilinged structures equipped with overhead cranes to facilitate maintenance and equipment replacement. They are known for being loud and hot environments due to the steam cycle processes. The turbine hall connects directly to the plant's High Voltage (HV) yard, ensuring that the electricity produced is transmitted efficiently to the grid.

Table 4-4 – Reactor Parameters⁴³

Aspect	Detail
Export Capacity	Up to 5 200 MW (subject to finalisation based on generation capacity scenario selection)
Design Life	60 years with possibility to extend to 80 years
Reactor	The list of PWRs and SMRs that is considered for the purposes of developing the PPE is as listed below: ■ Evolutionary Power Reactor (EPR) – Areva, France ■ Advanced Passive 1000 (AP1000) – Westinghouse, USA ■ Advanced Power Reactor 1400 (APR1400) – KEPCO, South Korea ■ VVER-1200 – Rosatom, Russia ■ CAP1000 – China's Advanced Passive 1000 Reactor ■ Hualong One (HPR1000) – China National Nuclear Power Corporation ■ NuScale – 160 MWt (50 MWe) ■ SMR-160 – Holtec SMR, LLC, 525 MWt (160 MWe) ■ Pebble Bed Modular Reactor (PBMR) – 400 MWt ■ High Temperature Gas-Cooled Reactor (HTR-PM) – CNNC, 250 MWt (211 MWe) ■ Gas Turbine-Modular Helium Reactor (GT-MHR) – 600 MWt ■ International Reactor Innovative and Secure (IRIS) – 1,000 MWt (~335 MWe) ■ Westinghouse SMR – 800 MWt (225 MWe) The final technology or design to be implemented will not be restricted to the above list but will be constrained by the set of PPE used for the impact assessment. Selection will remain subject to ongoing review and evaluation, taking into account technical performance, economic feasibility, environmental considerations, and regulatory requirements as the project progresses.
Max Height of the reactor building (without stack and cooling towers)	80 m
Plant Operating Life Cycle (time of operation between refuelling)	24 months
Plant Design Life	80 years
Station Capacity Factor⁴⁴	95%
Plant Efficiency⁴⁵	~33 - 42%

The reactor, the reactor buildings, nuclear auxiliary buildings and turbine halls are key components of the NPP; thus, forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase.

⁴³ Eskom Holdings SOC Ltd, November 2025, Plant Parameter Envelope for New Nuclear Power Plants at Coastal Sites

⁴⁴ The percentage of time the plant is expected to deliver its stated electrical output over the lifetime of the plant, considering all expected outages

⁴⁵ The ratio of useful electricity energy output from the plant, over a time period T, to the energy source supplied to the unit

4.2.2.2 Plant Heat Sink⁴⁶

The plant heat sink functions as the ultimate system for dissipating waste heat from the steam cycle into the environment, ensuring safe and efficient operation. This process begins at the condenser, where exhaust steam from the turbine is cooled and condensed using large volumes of water or air. The cooling system may draw directly from the sea but is subjected to strict limits on the maximum allowable temperature rise in the sea to protect marine ecosystems. Where direct discharge is not feasible, natural draft cooling towers use ambient air flow to remove heat, with performance influenced by air temperature and humidity levels, while hybrid cooling towers combine wet and dry mechanisms to balance efficiency with reduced water consumption and minimised visible plumes. In all cases, the design of the heat sink must account for ambient air requirements, humidity conditions, and environmental constraints. The parameters related to the plant heat sink are detailed in Table 4-5.

Table 4-5 – Plant Heat Sink Parameters⁴³

Aspect	Detail		
Ambient Air Requirements and Humidity Conditions	Maximum Air Design Temperature (0% exceedance)	Minimum Air Design Temperature (0% exceedance)	Design Basis Maximum External Humidity
	Long term base (> 7 days) = 42°C Short term daily (6 hours to 7 days) = 46°C Instantaneous (6 hours) = 50°C	Long term base (> 7 days) = 2.8°C Short term daily (6 hours to 7 days) = 0 °C Instantaneous (6 hours) = -2°C	Winter: 100% at -25°C Summer: 31% relative humidity at 46°C
Condenser	Max Inlet Temp Condenser/Heat Exchanger		Condenser Heat Rejection/Heat Exchanger Duty
	32.78°C		3 400 MW
Once-Through Cooling	Cooling Water Flow Rate (l/s)	Cooling Water Temperature Rise (°C)	Cooling Water Temperature Range (°C)
	243 200	12	-0.5 to +30
Maximum increase in the cooling water source	The intake and the outfall configuration should not result in a net rise in CW. The maximum increase in the temperature of the recirculated water should be < 1.5°C. Increases in the water temperature will most likely be limited by environmental issues for each specific site.		

The plant heat sink is a key component of the NPP; thus forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase.

⁴⁶ U.S. Nuclear Regulatory Commission's Regulatory Guide 1.27, Rev. 3: Ultimate Heat Sink for Nuclear Power Plants

4.2.2.3 Circulating Water Treatment System (CTE)^{47,48,49}

The Circulating Water Treatment System is a critical support system that ensures efficient thermal management and reliable plant operation. Its primary function is to provide large volumes of cooling water to the turbine condenser, where steam exhausted from the turbine is condensed back into liquid form to maintain the efficiency of the steam cycle. The system draws water from the external heat sink, the ocean or cooling tower, circulates it through the condenser and auxiliary cooling systems, and then returns the warmed water to the heat sink for cooling and reuse. Because this process involves continuous interaction with natural water sources, the Circulating Water Treatment System incorporates treatment measures to control scaling, corrosion, and biological fouling, thereby protecting plant equipment and minimising environmental impacts. Although not directly tied to nuclear safety systems, the CTE is essential for maintaining stable plant performance, preventing overheating, and ensuring compliance with environmental discharge standards. Plant parameters are provided in Table 4-6.

Table 4-6 – Circulating Water Treatment Parameters

Circulating Water Treatment System	
Total residual oxidant	0.5 mg/l

The CTE is a key component of the NPP; thus, forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase.

4.2.2.4 Intake Structure^{50,51}

An intake structure is a critical component of the circulating water system, designed to draw large volumes of water from the ocean. Its primary function is to provide a continuous and reliable supply of cooling water to the condenser and auxiliary systems, ensuring efficient heat removal from the plant's steam cycle. The intake structure typically consists of channels, screens, and pumps that regulate water flow and prevent debris, aquatic organisms, and sediments from entering the plant's cooling system. By filtering and controlling the quality of incoming water, the intake structure protects equipment from fouling, corrosion, and mechanical damage, thereby maintaining operational efficiency and reliability. A stilling basin may be applicable to the Bantamsklip site and possibly the Thyspunt site. The parameters related to the intake structure are detailed in Table 4-7.

⁴⁷ AREVA (2010) *U.S. EPR Design Control Document, Rev. 1, Section 10.4.5 – Circulating Water System*. United States Nuclear Regulatory Commission. Available at: <https://www.nrc.gov/docs/ML1020/ML102040550.pdf> (<https://www.bing.com/search?q=https%3A%2F%2Fwww.nrc.gov%2Fdocs%2FML1020%2FML102040550.pdf>).

⁴⁸ Turbine Logic (2023) *Circulating Water System in Nuclear Power Plants*. Turbine Logic Technical Articles. Available at: <https://turbinelogic.com/circulating-water-system-nuclear-power> (<https://www.bing.com/search?q=https%3A%2F%2Fturbinelogic.com%2Fcirculating-water-system-nuclear-power>).

⁴⁹ World Nuclear Association (2024) *Cooling Power Plants*. World Nuclear Association. Available at: <https://world-nuclear.org/information-library/current-and-future-generation/cooling-power-plants> (<https://www.bing.com/search?q=https%3A%2F%2Fworld-nuclear.org%2Finformation-library%2Fcurrent-and-future-generation/cooling-power-plants>).

⁵⁰ International Atomic Energy Agency (IAEA) (2007) Nuclear Power Plant Design Characteristics: Structure of Nuclear Power Plant Design Characteristics in the IAEA Power Reactor Information System (PRIS). IAEA-TECDOC-1544. Available at: https://www-pub.iaea.org/MTCD/publications/PDF/te_1544_web.pdf.

⁵¹ World Nuclear Association (2024) Cooling Power Plants. World Nuclear Association. Available at: <https://world-nuclear.org/information-library/current-and-future-generation/cooling-power-plants.aspx>.

Table 4-7 – Intake Structure Parameters

Intake Structure						
Intake	Distance off shore (m)	Number of Tunnels (for power station)	Diameter of tunnels (m)	Water velocity at intake (m/s)	Water velocity in tunnel (m/s)	Depth of Tunnels (m)
	1 000 to 2 000	2 - 3	5 to 10	± 1,0	± 3,0	± 30
Structure at Intake	1. Letterbox. 2. The design can also include a vertical tube extending approximately 3-5m above the sea bed to prevent the drawing of large quantities of sediment.					
Spoil	Placed in Rock Retaining Wall and unsuitable material to be used to level HV yard. Any additional will be transported to a suitable approved location off site.					

The intake structure is a key component of the NPP; thus, forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase.

4.2.2.5 Outfall Structure^{52,53}

An outfall structure is a key component of the circulating water system, designed to safely discharge heated cooling water back into the natural environment after it has passed through the condenser and auxiliary systems. Its primary function is to return this water to the ocean—in a controlled manner that minimises thermal and ecological impacts. The structure typically consists of engineered channels, pipes, or diffusers that regulate flow and disperse the discharge to reduce localised temperature increases and prevent erosion or sediment disturbance. By carefully managing the release of cooling water, the outfall structure ensures compliance with environmental regulations governing thermal pollution and water quality standards. The parameters related to the outfall structure are detailed in Table 4-8.

Table 4-8 – Outflow Structure Parameters

Outfall Structure				
Outfall type	Can be off shore via tunnels or out flow like Koeberg.			
Tunnel alternative	Number of tunnels	Diameter of tunnels (m)	Distance off shore (m)	Depth of Tunnels (m)
	3 to 4	Approximately 3	Approximately 500	Approximately 5
Water velocity at the outfall	Approximately 1,0 m/s			

⁵² World Nuclear Association (2024) Cooling Power Plants. World Nuclear Association. Available at: <https://world-nuclear.org/information-library/current-and-future-generation/cooling-power-plants.aspx>.

⁵³ U.S. Environmental Protection Agency (EPA) (2023) Regulations on Cooling Water Intake and Discharge Structures. EPA. Available at: <https://www.epa.gov/cooling-water-intake-structures>.

The outfall structure is a key component of the NPP; thus, forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase. The outfall structure will also require a Coastal Waters Discharge Permit from DFFE as per Section 69 of the National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008). However, specialist assessments are being undertaken to support this process.

4.2.2.6 Potable Water/ Waste System^{54,55,56,57,58}

The potable water and waste system ensures the reliable supply, storage, and safe discharge of water used for domestic, sanitary, and auxiliary purposes. Potable water requirements are carefully calculated to meet the daily needs of staff and operational support facilities, with maximum use scenarios considered to size supply infrastructure and storage volumes adequately.

A water reservoir primarily provides a reliable source of cooling water for the condenser system, which is essential for converting steam back into liquid during electricity generation. It also ensures a backup supply of water for reactor core cooling and SNF storage pools, maintaining safety in both normal operations and emergency scenarios. Additionally, reservoirs support water management during construction, flushing, and maintenance phases, while also helping regulate discharges from liquid radioactive waste treatment systems. By securing a stable water supply, reservoirs play a vital role in sustaining plant efficiency, safety, and compliance with environmental standards.

Wastewater generated from these uses is collected, treated, and discharged at controlled flow rates to prevent adverse impacts on receiving environments, with monitoring systems in place to verify compliance with discharge permits.

A Waste Water Treatment Plant (WWTP) is a vital facility designed to manage and treat liquid effluents generated during plant operations. Its primary function is to ensure that wastewater, which may include both conventional industrial effluents and low-level radioactive liquid waste, is treated to meet regulatory standards before discharge into the environment. Treatment processes typically involve physical, chemical, and biological methods to remove contaminants such as suspended solids, oils, heavy metals, and radionuclides.

The potable water/ waste system parameters are detailed in Table 4-9.

⁵⁴ International Atomic Energy Agency (IAEA) Safety Standards Series, particularly IAEA Safety Standards for Nuclear Power Plants: Design (SSR-2/1)

⁵⁵ International Atomic Energy Agency (IAEA). (2021). Efficient Water Management in Nuclear Power Plants.

⁵⁶ Vasilyeva, S., Kosarev, S., Markov, D., Bedanokov, A., Tsarev, V. and Tutnov, I. (2021) The Concept of Nuclear Power Plant Wastewater Treatment Using Two-Component System Units. Report. Available at: <https://www.researchgate.net/publication/354123456>.

⁵⁷ Water & Wastewater (2023) Nuclear Wastewater Treatment: Challenges, Technologies, and Future Perspectives. Water & Wastewater Blog. Available at: <https://www.waterandwastewater.com/nuclear-wastewater-treatment>.

⁵⁸ International Atomic Energy Agency (IAEA) (2018) *Management of Discharge of Liquid Radioactive Waste from Nuclear Facilities*. IAEA Safety Standards Series No. WS-G-2.3. Available at: <https://www.iaea.org/publications/1106>.

Table 4-9 – Potable Water/ Waste System Parameters⁴³

Aspect	Detail	
Discharge Flow Rate	Effluent Normal ⁵⁹ 13.6 m ³ /s	Effluent Maximum ⁶⁰ 44.97 m ³ /s (67 m ³ /s)
	Dependent upon chosen reactor technology	
Potable Water Requirements	70.72 l/s (site establishment) 91.64 l/s (early site activities) 94.94 l/s (early construction activities) 82.00 l/s (construction) 30.39 l/s (operation)	
Maximum Use	140 l/s 104.72 l/s (for air-cooled reactors)	
Stored Water Volume (potable water supply requirements)	Site water (SEP) – 4 8740 m ³ Feed water (SER) – 8 073 m ³ Demineralised (SED) – 1 346 m ³ Condensate feed water (ASG) – 4 306 m ³ Demineralised primary make-up water (REA) – 45 747 m ³ Borated Refuelling Water (PTR) – 8 611 m ³	

Potable and waste water infrastructure is a key component of the NPP; thus, forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase.

4.2.2.7 Demineralised Water System^{61,62,63,64}

A demineralisation plant is designed to produce ultra-pure water by removing dissolved minerals and ionic contaminants such as calcium, magnesium, sodium, chloride, sulphate, and silica. This high-purity water is essential for use in boilers, turbines, and other closed-loop systems where even trace amounts of minerals can cause scaling, corrosion, and deposition, leading to reduced efficiency and potential equipment damage.

Raw water is withdrawn from the source within regulated maximum limits, treated to remove dissolved minerals, and stored in dedicated tanks sized to meet operational demand and provide reserve capacity for contingencies. The system's design accounts for the maximum use scenarios to avoid over-extraction and ensure sustainable resource management. Any discharge of excess or waste streams to site water bodies is carefully controlled, with flow rates monitored and treated to comply with environmental standards, thereby minimising ecological impacts.

The demineralised water system parameters are detailed in Table 4-10.

⁵⁹ Expected (normal) effluent flow rate from the potable/ water system to the Waste Water Treatment System (WWTW). 80% of sewerage directed to municipal WWTW. The rest (20% <100m³/day) to be treated on site before discharge into the sea.

⁶⁰ Expected (maximum) effluent discharge rate from on-site WWTW

⁶¹ U.S. Nuclear Regulatory Commission (NRC) documentation on plant water use

⁶² The Critical Role of Demineralized Water in Power Plants (Agape Water Solutions)

⁶³ Agape Water Solutions (2023) The Critical Role of Demineralized Water in Power Plants. Agape Water Solutions. Available at: <https://agapewater.com/demineralized-water-power-plants>.

⁶⁴ International Atomic Energy Agency (IAEA) (2024) Nuclear Desalination. IAEA. Available at: <https://www.iaea.org/topics/nuclear-desalination>.

Table 4-10 – Demineralised Water System Parameters⁴³

Aspect	Detail
Discharge to Site Water Bodies Flow Rate	27.76 l/s (49.96 l/s) (4 units)
Maximum use / withdrawal from water source	49.96/s (4 units)
Capacity of demineralised water storage	4 x 2 200 m ³ + 2 x 800 m ³ 45 747 m ³ {2 Demineralised primary make-up water tanks (REA) [8 500 m ³] 17 595 m ³ }

The demineralised water system is a key auxiliary component of the NPP; thus, forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase.

■ Desalination Plant

A desalination plant is primarily intended to convert seawater or brackish water into potable water by removing salts and other impurities. As the NPP will be located next to the coast, a desalination plant will be integrated to provide fresh water for plant operations. The permanent desalination plant will be constructed and commissioned during the construction phase and will continue to operate during the operation of the NPP.

A temporary modular desalinisation plant will be installed during construction. This relatively small plant in container units will use beach wells for the intake of seawater. Beach wells are wells sunk into the beach and the water which fills these wells will serve as intake seawater for the temporary desalination plan as well as to initially supply the permanent desalination plant. The sea water intake area will be lined with waterproof material.

Table 4-11 – Desalination Plant Parameters

Desalination Plant					
Type	Reverse Osmoses				
Will the sea water needed be taken up through the uptake pipes used for cooling water?	Not initially. Will later be incorporated when the cooling water infrastructure is complete.				
What maximum input volume of water will be needed and how does it compare to the uptake of cooling water	29 250 maximum = 0.34 % of intake (m ³ /day)				
Output of Plant	Site preparation	Earth works	Construction	Commissioning	Operation
	390 m ³ /day	11 700 m ³ /day	1 690 m ³ /day	2730 m ³ /day	7 800 m ³ /day
Will the desalination plant run continuously?	It will run constantly during earth works. Only one unit will run during construction and the operation of the 3 units will alter during operation.				

What is the volume and chemical composition, salinity, PH and temp of discharged water?	The effluents of reverse washings in the water will be directed to the collection sump the mixture of water and chemicals shall then be directed by means of pumping to a neutralisation pit. Discharge at ambient.?	
Brine	Input	Output
	35 000 ppm	65 000 ppm
Temporary outfall requirements	Beach wells for intake and off shore disposal of brine to provide water for site preparation, earth works and construction phase for temporary desal plant	

The desalination plant is a key auxiliary component of the NPP; thus, forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase. Brine disposal will require a Coastal Waters Discharge Permit from DFFE as per Section 69 of the National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008). However, specialist assessments are being undertaken to support this process, and the effects of brine disposal included within the specialist assessments.

4.2.2.8 Fire Protection System^{65,66}

The fire protection system is designed to safeguard personnel, equipment, and critical structures by ensuring rapid detection, suppression, and containment of fire hazards. It incorporates dedicated water supplies, with maximum use of raw water carefully assessed to avoid undue strain on local resources, and stored water volumes sized to provide reliable capacity for emergency response under worst-case scenarios. The system's design ensures that adequate reserves are always available.

The parameters associated with the fire protection system are detailed in Table 4-12.

Table 4-12 – Fire Protection System Parameters⁴³

Aspect	Detail
Maximum Use of Raw Water	104.2 l/s Dependent upon chosen reactor technology
Stored Water Volume	15 254.2 m ³

The water storage facility forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase.

4.2.2.9 Nuclear Fuel^{67,68}

Fuel provides the fissile material—typically uranium or mixed oxides—that sustains the chain reaction and generates the heat required for electricity production. Once fuel assemblies are used and their efficiency declines, they are removed from the reactor and initially placed in the SNF

⁶⁵ International Atomic Energy Agency (IAEA) – Fire Protection in Nuclear Power Plants (IAEA-TECDOC-1944)

⁶⁶ U.S. Nuclear Regulatory Commission (NRC) – Fire Protection Program for Operating Reactors

⁶⁷ U.S. Nuclear Regulatory Commission (NRC) – Spent Fuel Storage in Pools and Dry Casks: Key Points and Questions

⁶⁸ nuclear-power.com – Dry Storage of Spent Nuclear Fuel

storage pool, where water provides both cooling and radiation shielding. After sufficient cooling and reduction in radioactivity, SNF may be transferred to dry storage systems, which use robust, sealed casks to safely contain the material without reliance on water. The dry storage facility will store used nuclear fuel from the reactors of the power station. The dry storage facility will comprise of concrete pad(s) for used nuclear fuel generated at the NPP up to the end of operational life of plant.

The fuel parameters are detailed in Table 4-13.

Table 4-13 – Fuel Parameters⁴³

Aspect	Detail			
Fuel	Fuel Enrichment ⁶⁹	Mass of fuel in core ⁷⁰	Mass of Zirconium alloys in core	Total Mass of used fuel during Licensed Operation
	45% - Conventional PWR 20% - SMR	460 T	~112 T	~5925 T (60 years) per unit
SNF Storage Pool	Capacity		Volume	
	10 years + full core offload (nominal)		3 380 m ³ total volume below normal water level assemblies or racks)	
SNF Dry Storage	Acreage		Storage Capacity	
	12.14 ha		80 years	

4.2.2.10

Standby Power System^{71,72,73,74,75}

The standby power system provides critical backup electricity to ensure the safe operation of essential systems during loss of off-site power. It typically includes diesel generators, which supply immediate and reliable power to safety systems, and station black-out diesels designed to operate under extended grid failure conditions. In some plants, gas-turbine units are incorporated to enhance redundancy and provide rapid response capability. Together, these components ensure that reactor cooling, control, and monitoring functions remain available under all circumstances.

Gas turbines serve as auxiliary power generation units that enhance operational flexibility and reliability. Their primary function is to provide a rapid and independent source of electricity, particularly during plant start-up, shutdown, or emergency conditions when the main reactor and

⁶⁹ Concentration (weight percent fraction) of U-235 in the fuel uranium

⁷⁰ The total mass of uranium dioxide in the core

⁷¹ NRC Training Material – Emergency Diesel Generators

⁷² IAEA Safety Guidance – Station Blackout Provisions

⁷³ U.S. Department of Energy (DOE) (2023) How Gas Turbine Power Plants Work. DOE Office of Fossil Energy and Carbon Management. Available at: <https://www.energy.gov/fecm/how-gas-turbine-power-plants-work>.

⁷⁴ Doligalski, A. (2024) Gas Turbine Nuclear Power Plants. SlideShare. Available at: <https://www.slideshare.net/AdamDoligalski/gas-turbine-nuclear-power-plants>.

⁷⁵ Saif, M. (2023) Gas Turbine Power Plant: Diagram, Working & Types. Turbine Logic. Available at: <https://turbinelogic.com/gas-turbine-power-plant>.

steam cycle may not be available. Unlike the nuclear steam cycle, which requires significant time to reach operational capacity, gas turbines can be started quickly and deliver power almost immediately. This makes them valuable for supplying essential services such as pumps, control systems, and safety equipment, ensuring that critical functions remain powered even in the event of grid disturbances or reactor downtime.

In addition to their role in emergency preparedness, gas turbines can also contribute to overall plant efficiency by supplementing electrical output during peak demand periods. In advanced nuclear designs, such as HTGRs, gas turbines may be integrated directly into the power conversion system, using helium or other gases in a closed Brayton cycle to achieve higher thermal efficiencies—often exceeding 40%. This integration highlights the potential of gas turbines not only as backup units but also as part of innovative nuclear energy systems that combine safety, efficiency, and versatility.

The parameters associated with the standby power system are detailed in Table 4-14.

Table 4-14 – Standby Power System Parameters⁴³

Aspect	Detail			
Diesel	Diesel Capacity	Diesel Exhaust Elevation	Diesel Noise	Diesel Storage Tanks Capacity
	4 x 20 MW	15.2 m	60 dBA	3 900 m³
Station Black-out Diesels	Diesel Capacity		Diesel storage tanks capacity	
	2 x 5 MW		1 300 m³	
Gas-Turbines	Gas-Turbine Capacity		Gas-Turbine Noise	
	77 MW		Average sound attenuation – 85 dBA @ 1 m from the package and 1.5m above ground	
Gas Turbines				
General Specifications	Gross Output Power (2off)	Gross Efficiency		Fuel mass flow
	77 MW	34.00%		2.26 kg/s
Exhaust Gas	Exhaust gas mass flow	Exhaust gas temperature		Gas Composition
	111 kg/s	538°C		N₂: 74.80% O₂: 13.90% CO₂: 4.20% H₂O: 6.20% Ar: 0.90% SO₂: 0.00%

Diesel and gas as a standby are required for the operation NPP; thus, forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase.

4.2.2.11 Hydrogen Plant (H₂)^{76,77}

A hydrogen plant (H₂) serves an important supporting role in both operational reliability and broader energy applications. Its primary function is to produce hydrogen gas, typically through electrolysis or other chemical processes, for use within the plant's systems. One of the most common applications is in the cooling of large electrical generators, where hydrogen is employed because of its excellent thermal conductivity and low density. This allows efficient removal of heat from generator windings, thereby improving performance and extending equipment life. In addition, hydrogen produced on-site can be used for maintenance activities, chemical processes, or stored for potential integration into emerging energy applications such as fuel cells or synthetic fuel production. Refer to Table 4-15 for the parameters associated with the Hydrogen Plant.

Table 4-15 – Hydrogen Plant Parameters

Hydrogen Plant (H ₂)	
H ₂ Plant / Unit	15 x 2 Nm ³ /h @ 25
4 x Storage Tanks	30 Nm ³ each

The Hydrogen Plant is a key auxiliary component of the NPP; thus, forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase.

4.2.2.12 Airborne Effluent Release^{78,79,80}

The airborne effluent release system manages and monitors the controlled discharge of gaseous emissions to the atmosphere, ensuring compliance with radiological safety and environmental standards. During normal operation, annual average atmospheric dispersion factors (CHI/Q) are used to model how effluents disperse and dilute, supporting dose consequence assessments to demonstrate that public exposure remains well below regulatory limits. In accident scenarios, conservative CHI/Q values are applied to evaluate worst-case dispersion and potential radiological impacts. The release point, typically a stack or vent, is designed to optimise dispersion and minimise ground-level concentrations. The airborne effluent release parameters as relevant to the PPE are detailed in Table 4-16.

Table 4-16 – Airborne Effluent Release Parameters⁴³

Aspect	Detail	
Atmospheric Dispersion (CHI/Q) (Accident)	Exclusion Area Boundary (EAB)	Low Population Zone Boundary
	800 m to 2 Km	3.22 km

⁷⁶ International Atomic Energy Agency (IAEA) (2024) Nuclear Hydrogen Production. IAEA. Available at: <https://www.iaea.org/topics/non-electric-applications/nuclear-hydrogen-production>.

⁷⁷ World Nuclear Association (2024) Hydrogen Production and Uses. World Nuclear Association. Available at: <https://www.world-nuclear.org/information-library/energy-and-the-environment/hydrogen-production-and-uses>.

⁷⁸ U.S. NRC – NUREG-0800, Standard Review Plan, Section 2.3.4: Short-Term Dispersion Estimates for Accidental Atmospheric Releases

⁷⁹ U.S. DOE – Technical Report for Calculations of Atmospheric Dispersion at Onsite Locations (NSRD-2015-TD01)

⁸⁰ IAEA – Atmospheric Dispersion in Nuclear Power Plant Siting (Vienna, 1980)

Aspect	Detail			
Atmospheric Dispersion (CHI/Q) (Annual Average)	2.00E-05 s/m ³ Vendor design specific			
Dose Consequences	Normal (Public)	Normal, limiting	Design Basis Accident (DBA)	Severe Accidents (Beyond Design Basis Accidents – BDBA)
	The dose limit is 1 mSv/a from all authorised actions (the regulatory effective dose limit for members of the public. Dose constraint is 0.25 mSv/a specific to the authorised action taking into account dose limits as specified in R.388. Regulatory limit.	Regulatory limit		
Release Point	Configuration	Elevation (Normal Operation)	Elevation (Design Basis Accident)	Minimum Distance to the Site Boundary
	Vertical	29.1 m	Ground level	0.8 km

4.2.2.13 Auxiliary Steam Boiler⁸¹

An Auxiliary Steam Boiler is a smaller, secondary boiler system designed to provide steam for essential plant functions outside of the main reactor-driven steam cycle. Its primary role is to supply steam during plant startup, shutdown, or when the main steam system is unavailable. Typical uses include:

- Supplying steam to turbine gland seals, air ejectors, and other auxiliary equipment.
- Providing steam for heating applications, such as fuel oil preheating or process heating in auxiliary systems.
- Supporting deaerators and other feedwater treatment systems.
- Ensuring standby steam availability for safety and operational reliability.

⁸¹ Turbine Logic. (n.d.). Auxiliary Systems in Nuclear Power Plants. Available at: <https://turbinelectric.com>

Because of its smaller capacity and quick response, the auxiliary steam boiler is critical for maintaining plant readiness and supporting operations when the main reactor is not producing steam.

Table 4-17 – Auxiliary Steam Boiler Parameters

Auxiliary Steam Boiler	
Auxiliary Steam Boiler	8 x 32 t/h
Diesel Storage Tanks	676 m ³

The auxiliary steam boiler is a key auxiliary component of the NPP; thus, forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase.

4.2.2.14 Helicopter Landing Pad⁸²

The primary function of a helicopter landing pad at a NPP is to provide rapid access for emergency response teams, medical evacuation, and specialised personnel in the event of an incident requiring immediate intervention. In addition, the helipad supports routine operations such as the transport of staff, equipment, and materials that may need expedited delivery, particularly in remote or coastal areas where road access is limited.

Table 4-18 – Helicopter Land Pad Parameters

Helicopter Landing Pad	
Landing pad planned on site	Yes
Aviation fuel storage tank	5 m ³

4.2.2.15 Staffing, Offices, Support Facilities, Power Block and other Plant Characteristics

The NPP is expected to have office facilities, parking lots, permanent support facilities, a power block, protected areas and a switchyard. The staff composition is made up of vendor construction workers, vendor staff, Eskom project staff and consultants, off-site substation and transmission personnel, operational on-site personnel and refuelling/major maintenance staff. The plant characteristics as applicable to the PPE are detailed in Table 4-19.

Table 4-19 – Plant Characteristics⁴³

Aspect	Detail	
Access Routes	Heavy Haul Routes	Maximum Shipment Weight
	4.00 ha	1 100 tons

⁸² International Atomic Energy Agency (IAEA) (2015) Emergency Preparedness and Response for Nuclear Power Plants. IAEA Safety Standards Series No. GS-G-2.1. Vienna: IAEA. Available at: <https://www.iaea.org/publications/7076/emergency-preparedness-and-response-for-nuclear-power-plants>.

Aspect	Detail					
Acreage (to support plant operations)	Office Facilities	Parking Lots	Permanent Support Facilities	Power Block ⁸³	Protected Areas (maximum)	Switchyard (maximum)
	11 ha	2.5 ha	11 ha	20.6 ha	40 ha	9.7 ha
Plant Population	Construction		Operation		Refuelling/Major Maintenance	
	6 500 vendor construction workers 2 860 vendor staff 300 Eskom Project Staff 52 Eskom Consultants 700 (off-site – 300 substation, 400 transmission)		2 400 persons (on-site)		1 000 persons	

These parameters form part of the current ESIA application and is preliminary assessed in this Scoping Phase.

4.2.2.16 Construction

The site-preparation period is expected to be between 24 – 36 months, with the construction phase accommodating for laydown areas, temporary construction facilities and a construction parking lot. The construction period will be 5 – 8 years.

The construction parameters and civil works parameters are outlined in Table 4-20 and Table 4-21 that form part of the of the current EISA application and is preliminary assessed in this Scoping Phase.

Table 4-20 – Construction Parameters⁴³

Aspect	Detail		
Access Routes	Construction Module Dimensions		Heaviest Construction Shipment
	Reactor Vessel 6.71 D x 10.36 L Steam Generator 6.10 D x 24.38 L Generator Stator 5.49 D x 12.19 L Modules by barge: 27.43 (H) x 24.99 (W) x 28.35 (L) OR 39.62 (D) x 15.54 (H) (All dimensions in m) Design specific		1 100 tonne
Acreage	Laydown Areas	Temporary Construction Facilities	Construction Parking Lot

⁸³ Power block is defined as all structures, systems and components which perform a direct function in the production of, transport of, or storage of heat energy, electrical energy or radioactive wastes. Also included are structures, systems and components that monitor, control or protect the public health and safety

Aspect	Detail		
	23.5 ha (for laydown only)	24.3 ha (concrete batch plant)	16.2 ha (Construction parking with separate construction site access road)
Temporary Construction Facilities	- A temporary coffer dam in the ocean. - A temporary spoil pipeline into the ocean for construction and/or spoil pipeline to the beach. - Laydown areas and other areas to be cleared during construction.		
Construction Noise	76-101 dBA at 15 m from noise source		
Site Preparation Duration	24 – 36months		
Construction Period	5 – 8 years		

Table 4-21 – Civil Works Parameters

Civil Works (Existing landscape)					
Maximum height above MSL	14 m				
Minimum height above MSL	6 m				
Finished Terrace above MSL	14 m (SSR Study Section 5.9 based on the high scenario sea level rise)				
Bantamsklip Spoil	Natural Ground to Topsoil (0,3m deep)	Sand Stockpile	Backfill	Sand to Spoil	Rock Stockpile
	197 850 m ³	11 965 574 m ³	1 892 301 m ³	10 073 273 m ³	1 198 591 m ³
Thyspunt Spoil	229 456 m ³	7 890 419 m ³	1 518 375 m ³	6 372 044 m ³	708 356 m ³

4.2.2.17 Decommissioning

The decommissioning period is expected to be between 1 – 5 years, which includes temporary decommissioning facilities and the generation of decommissioning landfill materials. The decommissioning parameters are outlined in Table 4-22.

Table 4-22 – Decommissioning Parameters⁴³

Aspect	Detail	
Acreage	Laydown Area	Temporary Decommissioning Facilities
	~52 ha	~7 ha
Decommissioning Noise	80 -90 dB(A) at 15 m from noise source	
Plant Decommissioning Population	1 000 persons	
Site Preparation Duration	Variable based on plant owner decommissioning strategy and plan. OR	

Aspect	Detail			
	1 to 5 years (Assuming preparation encompasses nuclear fuel (both new and spent) removal from site and removal of all radioactive wastes).			
Delay Time Prior to Decommissioning	If deferred dismantling is planned, then a wait time of 10 years is recommended to allow for short and intermediate lived nuclides to decay and Co-60 to reduce by a factor of four (half- life = 5.2 years)			
Mass of Plant Material and Components	Mass of Highly Active Material	Mass of Moderately Active Material	Mass of Low Activity Material	Mass of Non-Active Material
	28 800 T (steel and concrete)	21 800 T	76 200 T	567 270 T
Decommissioning Landfill Materials	705 480 T			

4.2.2.18 Liquid Radwaste System^{84,85}

The liquid radwaste system collects, processes, and treats radioactive liquid effluents generated during plant operations to ensure they meet strict regulatory limits before discharge. Release point flow rates are carefully monitored and controlled to minimise environmental impacts, with treatment and dilution systems designed to protect surrounding water bodies and maintain compliance with radiological safety standards.

The discharge rate when pumping from a liquid waste storage tank is limited and it is unlikely that a month's liquid discharge volume can be released into the marine environment over a period of a few hours. Liquids are stored in holding tanks prior to being discharged at certain times in the water. Liquid discharges are regular short-term discharges which occur repeatedly through the year and are modelled as continuous releases. A more accurate assessment of the liquid release should be available when a specific nuclear installation design becomes available⁸⁶.

In terms of radionuclide liquid waste, external exposure pathways include beta and gamma rays from beaches and fishing equipment, and ingestion pathways include fish, crustaceans and molluscs⁸⁶.

The liquid radwaste system parameters are detailed in Table 4-23.

Table 4-23 – Liquid Radwaste System Parameters⁴³

Aspect	Detail
Release Point Flow Rate	Approximately 0.6 l/s

⁸⁴ U.S. Nuclear Regulatory Commission (NRC) – NUREG-0800, Standard Review Plan, Section 11.2: Liquid Waste Management System

⁸⁵ International Atomic Energy Agency (IAEA) Safety Standards Series – Management of Radioactive Waste from Nuclear Power Plants and Research Reactors (No. WS-G-2.5)

⁸⁶ Eskom Holdings SOC Limited. (2025). Site Safety Report (SSR) for Thyspunt.

Discharge of treated liquid Radwaste will require a Coastal Waters Discharge Permit from DFFE as per Section 69 of the National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008). Specialist assessments are being undertaken to support this.

4.2.2.19 Solid Radwaste System^{87,88,89}

The solid radwaste system manages, processes, and stores low-level radioactive waste generated during routine operations, such as contaminated materials, filters, and resins. Storage facilities are designed to safely contain these wastes, with volumes carefully tracked and minimised through treatment and packaging. The solid radwaste system parameters are detailed in Table 4-24.

Table 4-24 – Solid Radwaste System Parameters⁴³

Aspect	Detail
Low Level Radwaste Storage	1 440 m ²
Volume	673.5 m ³ /y

On-site radwaste handling, storage and transportation form part of the ESIA process, and are accordingly further assessed by the specialists as part of the Scoping Phase.

The solid radwaste system excludes SNF. SNF will be transferred to interim storage facilities on site or kept at the spent fuel pool until a deep geological repository site becomes available for HLW, as discussed below.

■ Final Treatment of Waste⁹⁰

The existing Koeberg NPP provides an indication of the volumes of waste produced – approximately 500 drums of low-level waste per year and 150 drums of intermediate-level waste per year. It is currently not viable to reprocess SNF at Koeberg, so it is stored in a SNF pool at the NPP.

Nuclear waste storage sites are situated in remote, geologically stable areas where little seismic activity has been recorded for millions of years and where agricultural and mineral potential is minimal. Vaalputs (Figure 4-2), which is managed by the National Energy Corporation of South Africa (NECSA), is South Africa's site for the disposal of nuclear waste and is situated 600 km north of Cape Town. In this area, the annual evaporation exceeds the annual rainfall. In this way, even if radioactivity should escape, it could not contaminate ground water that might find its way to the surface.

The area allocated for burial of metal drums and concrete containers measure 700 m x 300 m (Figure 4-3). This area is sufficient for storing the nuclear waste of three NPPs the size of Koeberg for 40 years. The waste is stored in trenches 10 m deep. Radiation at the surface is almost at natural

⁸⁷ U.S. Nuclear Regulatory Commission (NRC) – Standard Review Plan, Section 11.4: Solid Waste Management Systems

⁸⁸ IAEA – Radioactive Waste Management at Nuclear Power Plants (Efremkov, IAEA Bulletin)

⁸⁹ Eskom Generation. (2021). Nuclear Waste Management at Koeberg. Available https://www.eskom.co.za/wp-content/uploads/2022/02/NU-0002-Nuclear-Waste-Rev-11.pdf?utm_source=copilot.com

⁹⁰ Eskom Nuclear Power Station and Associated Infrastructure, Final Scoping Report, 2008

levels and does not constitute a health hazard. However, for safety reasons, the area is fenced off and monitored.



Figure 4-2 – Vaalputs Nuclear Waste Storage Facility



Figure 4-3 – Storage of Waste at Vaalputs Nuclear Waste Storage Facility

Vaalputs in relation to the proposed NPP sites are depicted in Figure 4-4, with the Bantamsklip located approximately 708.8 km and Thyspunt located 1 120.3 km away from Vaalputs. The Vaalputs Nuclear Waste Facility is an already existing and licensed facility.



Figure 4-4 – Location of Vaalputs in relation to proposed NPP sites

4.2.2.20 Tall Meteorological Mast or alternative Meteorological Measurement Instrumentation⁹¹

A tall meteorological mast, or alternative meteorological measurement instrumentation serves the essential function of monitoring local weather and atmospheric conditions. These measurements are critical for assessing how radioactive materials might disperse in the event of an accidental release. Parameters such as wind speed, wind direction, temperature, humidity, and atmospheric stability are continuously recorded to support safety analyses, emergency preparedness, and environmental monitoring. The data ensures that plant operators and regulators can model dispersion patterns accurately, thereby protecting both the public and the environment.

The Thyspunt site is already equipped with a weather station, with a 10m mast, as depicted in Figure 4-5. A taller mast (approximately 120m) will be installed 1 – 2 years prior to construction. The tower is likely to be of a lattice design supported by guy ropes.

⁹¹ Radiation and Nuclear Safety Authority (STUK). (2003). Guide YVL 7.5: Meteorological Measurements of a Nuclear Power Plant. Helsinki: STUK. Available at: https://ohjeisto.stuk.fi/YVLold/YVL7.5en_2003-05-28.pdf.

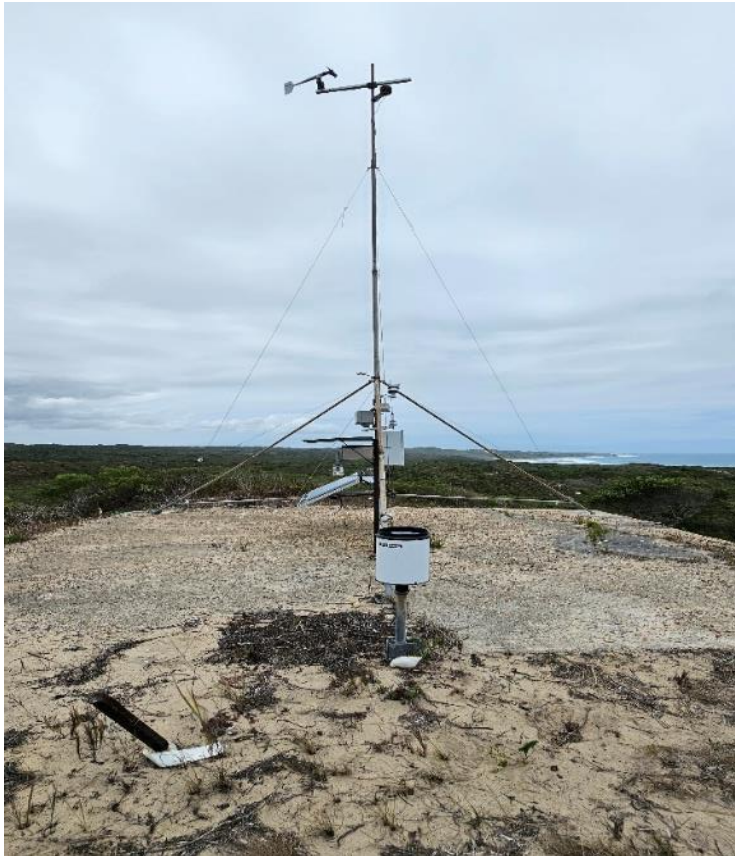


Figure 4-5 – Weather Station at Thyspunt⁹²

4.2.2.21 High Voltage Yard and Main Transmission Substation⁹³

Located adjacent to the proposed NPP, the 765 kV / 400 kV and 132 kV High Voltage (HV) yard is the immediate interface between the plant's generators and the transmission grid. Its primary role is to step up the voltage produced by the plant to high levels suitable for transmission, and to provide switching, protection, and isolation functions. It contains equipment such as transformers, circuit breakers, busbars, and disconnectors. Essentially, it ensures that electricity generated at the plant can be safely and reliably injected into the grid.

The Main Transmission Substation (MTS) is a larger, grid-level facility that receives bulk electricity from multiple generation sources (including nuclear plants) and redistributes it across the transmission network. It manages long-distance, high-voltage transmission and often steps down voltage for regional distribution.

⁹² Picture taken by WSP EAP team during Scoping site visit on 28 January 2026.

⁹³ Senda. (2025). HV, MV, and LV Substations: Differences and Applications. Senda Engineering Journal. <https://www.sendaelectric.com/hv-mv-and-lv-substations-differences-and-applications/>.

The HV yard forms part of the current ESIA scope and is preliminary assessed in this Scoping Phase. However, the MTS does not form part of the current ESIA scope and would require a separate EIA process.

4.2.2.22 Visitors' Centre

Areas will be demarcated for the following facilities covering a total floor area of approximately 1,800 m²:

- Exhibition area;
- Lobby;
- Cafeteria;
- Information centre;
- Administration offices;
- Meeting room;
- Ablution facilities;
- Storage facilities;
- Auditorium;
- Kitchen facilities; and
- Supporting facilities.

4.2.2.23 Housing – Staff Village

The staff housing does not form part of the current ESIA scope and would require a separate EIA process.

The accommodation will be integrated as far as possible with areas dedicated for housing in the existing planning processes of the local authorities within which the power station is proposed to be located. Where possible, employees (especially operational employees) will obtain accommodation in existing settlements. The approximately 1 400 operational staff will buy existing properties, build new accommodation or rent in the adjacent towns. If new urban developments have already been approved in or near the nearest towns, it would be Eskom's preference to make use of the opportunities provided by these developments rather than create new residential developments that would require separate EIAs.

The construction village for migrant workers will typically have the following facilities:

- Housing
 - 6 bed units (73 %); and
 - 3 bed units (27 %).
- Support facilities
 - Public transport hub and parking;
 - Canteen;
 - Liquor outlet;
 - Administration office;
 - Clinic; and
 - Sewage treatment.
- Typical recreation

Sport facilities (tennis, basketball, soccer, rugby, swimming pool etc.); and
Cloak rooms and ablutions.

The areas of the land will be finalised in terms of the residential densities prescribed by the Spatial Development Plan for the properties that are available. Eskom must provide rezoned land for the vendor to build a construction village for migrant workers. It will be Eskom's responsibility to facilitate the EIA processes for these facilities.

In addition, Eskom may provide serviced residential stands for the vendor to build staff accommodation. The accommodation will be finalised once the vendor is appointed. The land development will be included in the overall community integration strategy for the Eskom residential developments. It is also possible that Eskom will rent accommodation for the vendor staff from the community / developers.

The possible construction of further phases of power plants could result in the use of the Vendor's accommodation for a period of 10 to 15 years to accommodate contractors and may even be expanded during this period. The accommodation facilities will be upgraded and handed over to Eskom in good condition at the end of each contract.

4.2.2.24 Access Roads

As depicted in Figure 4-6, the Bantamsklip site is accessible from two entrance gates along the R43 from Pearly Beach, with internal gravel roads on a dune landscape. As depicted in Figure 4-7, the Thyspunt site is accessible from three entrance gates: namely the Eastern Entrance Gate, the Western Entrance Gate and the Northern Entrance Gate. The road network (internal and external) for Thyspunt is outlined in [Figure 4-8](#) and [Table 4-25](#).

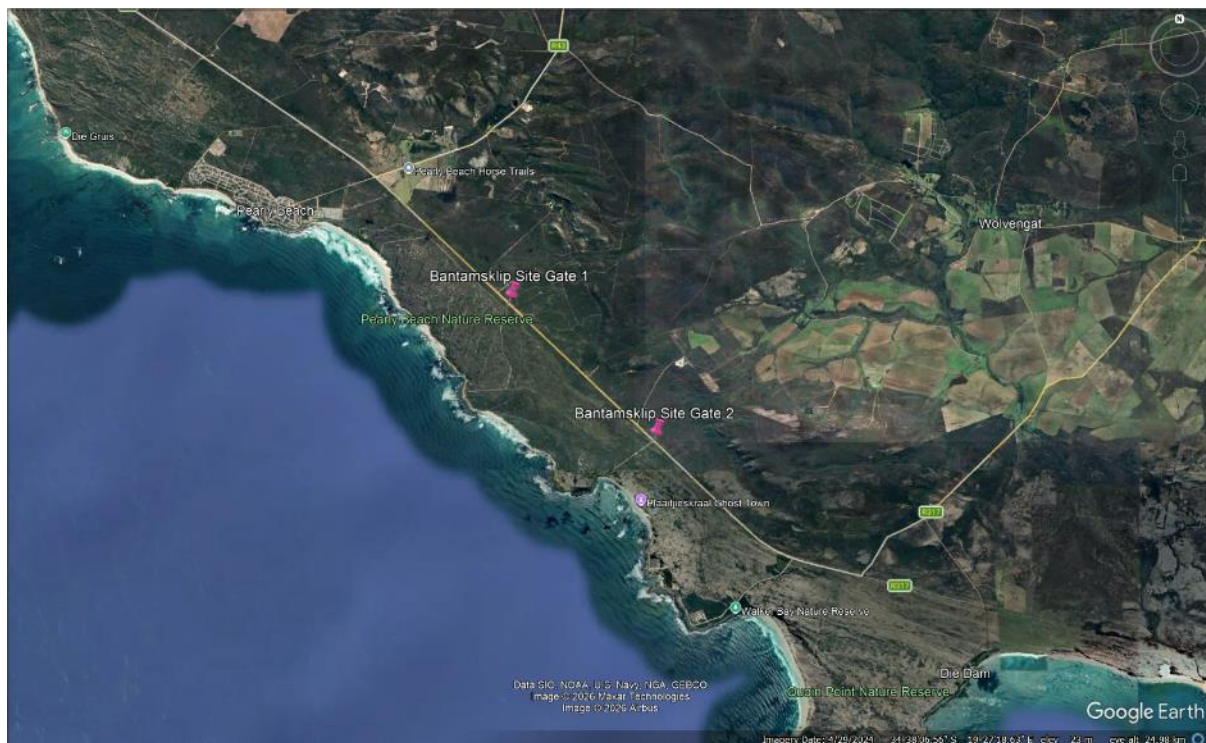


Figure 4-6 – Access Roads leading to Bantamsklip



Figure 4-7 – Access Roads leading to Thyspunt



Figure 4-8 – Access Road Network for Thyspunt

Table 4-25 - Access Road Network for Thyspunt

ROAD	DESCRIPTION
<u>N2</u>	<u>National Road from Gqeberha passing Humansdorp to Plettenberg Baai. Surfaced road.</u>
<u>R102</u>	<u>Provincial road from Jeffreys Bay through Humansdorp to Plettenberg Baai. Surfaced road.</u>
<u>R330</u>	<u>Provincial road from Humansdorp to St Francis Bay. Surfaced road</u>
<u>Construction Rd</u>	<u>The gravel road as a possible route for construction and heavy vehicles enroute to the Thyspunt site and Oyster Bay.</u>
<u>Camp Rd</u>	<u>A gravel road from Humansdorp past the identified site for the contractor's accommodation to the Thyspunt Site and Oyster Bay.</u>
<u>Link Rd</u>	<u>This road is a local surfaced road linking the R330 to the Camp road.</u>
<u>Rd WA 1</u>	<u>The Western Access road at Oyster Bay linking the gravel road to the Thyspunt Site. New surfaced road.</u>
<u>Rd EA 1</u>	<u>The Eastern Access road at St Francis Bay linking the R330 to the Thyspunt Site. New surfaced road.</u>
<u>Rd EA 2</u>	<u>Alternative route to Rd EA 1</u>
<u>Rd EA 3</u>	<u>Alternative route to Rd EA 1</u>

Any additional internal roads or expansion of existing roads required for the site forms part of the current ESIA and is preliminary assessed in this Scoping Phase. However, external road development and expansion do not form part of this ESIA and would require a separate EIA process.

■ Road Servitudes – On Site

Two on-site roads from public roads will be required for access to all sites for emergency purposes. Three alternative routes are under consideration at Thyspunt: an eastern, western and northern access route. Three alternative routes are under consideration at Bantamsklip. It is anticipated that all temporary and permanent services will be routed parallel to on-site access roads. This potential services infrastructure will include inter alia:

- Pipes for sand pumping;
- Conveyors to transport aggregate and spoil;
- Potable water pipes;
- Distribution power lines;
- Communication and data cables;
- Sewer lines; and
- Stormwater channels, pipes and culverts.

4.2.2.25 Transmission Integration

The integration of transmission infrastructure has been considered in the scoping phase. However, detailed transmission line routing and corridor-level impacts will be authorised through a separate EIA process under the responsible transmission entity, i.e. the National Transmission Company of South Africa (NTCSA). Given the significant costs associated with transmission integration and

requiring a level of certainty prior to initiating this, it is recommended the Generation site is selected prior to significant work being initiated for Transmission infrastructure⁹⁴.

Local Integration

Local integration focuses on community-level sustainability and asset management within a specific area. Local integration is often about distributed energy resources, resilience, and community involvement. A substantial number of transformers, substations and lines are required for local generation integration and evacuation in the southern supply areas.

Transmission Integration at Thyspunt

The integration of NPP at Thyspunt is based on constructing up to five 400 kV lines from the site towards Gqeberha and connecting to the 765 kV network at the Grassridge substation. The 400 kV lines will also integrate with the Dedisa substation and the new Gqeberha 400 kV substation to be established to supply the growing loads in this area. These 400 kV transmission lines form part of the development of the transmission networks to improve the security of supply in the Great Gqeberha area and in particular the Coega IDZ. The two 765 kV lines between Gamma and Grassridge substation will be required to be constructed by the time Thyspunt is commissioned to evacuate the excess power. This is depicted in Figure 4-9.

Thyspunt is less than 100 km from the main substations and around 1 400 km of 400 / 765 kV⁹⁵ lines will be required. No delay in integrating the NPP is expected from the transmission integration plan at Thyspunt. Thyspunt is located nearer to established transmission nodes in the Eastern Cape, including Grassridge and Dedisa. Integration is expected to require longer 765 kV transmission development, supplemented by shorter 400 kV connections into existing infrastructure. This enables partial utilisation of established servitudes and reduces overall construction complexity, environmental impact, and implementation risk.

⁹⁴ Additional clarity provided as a result of DFFE and Stakeholder comments.

⁹⁵ Error identified by Stakeholder comments. This error has been corrected. Chapter 4 and Chapter 6 now reference the same figures.

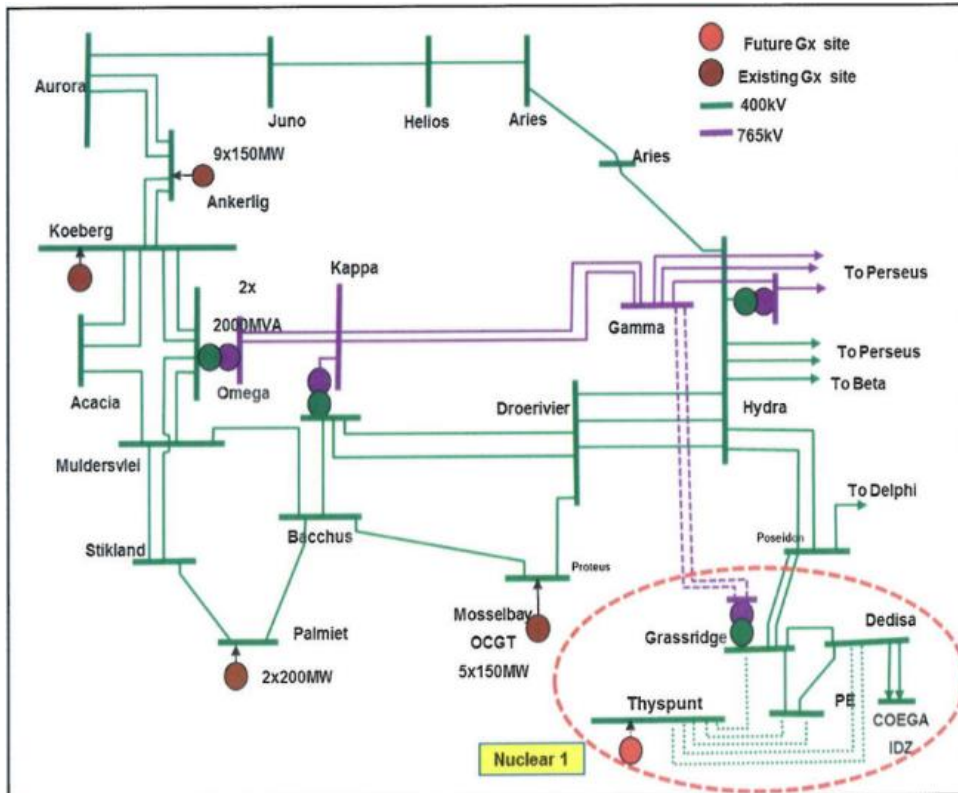


Figure 4-9 – Transmission Integration at Thyspunt

Transmission Integration at Bantamsklip

Bantamsklip is a very remote location with respect to both the existing network and any large load centre. There is no large, concentrated load development expected in the surrounding areas of the site in the foreseeable future. Four 765 kV transmission lines of around 250 km in length each will have to be constructed from the site to the Kappa 765 kV substation, giving a total of around 1000 km of 765 kV lines required. The NPP will be linked to the 765 kV substation at the Kappa site and will not be able to provide a 400 kV injection to support the network in this part of the Western Cape for future development. The 400 kV transmission support will have to come from somewhere else. This is depicted in Figure 4-10. If required for the NPP, then it will have to be integrated into the power system with the current recommended 765 kV transmission integration plan.

Bantamsklip presents a significantly higher level of transmission development complexity due to its limited proximity to existing high-voltage infrastructure. The nearest transmission substation is approximately 100–120 km away, requiring the establishment of new 400 kV and 765 kV corridors of up to 150–200 km each, as well as the development of multiple new substations and strengthening of the upstream Cape transmission backbone.

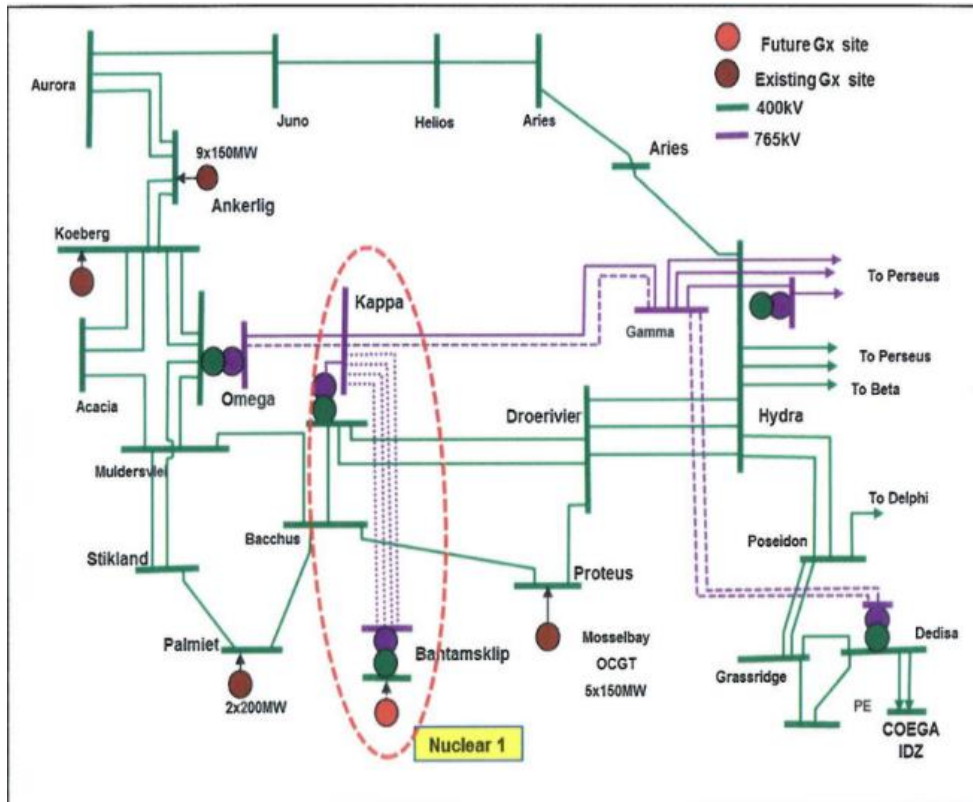


Figure 4-10 – Transmission Integration at Bantamsklip

Corridor

Corridor electricity transmission involves building high-capacity, long-distance powerlines to connect regions. Corridor transmission is about large-scale infrastructure for bulk power delivery and market integration. The transmission network capacity in the Western, Eastern, Northern Cape and parts of the North-West supply areas is severely constrained and would require substantial strengthening at local and corridor level to provide additional network capacity to integrate the new generation plants to the system.

The proposed transmission corridor development within South Africa is depicted in Figure 4-11.

Significant transmission development
is required in the northern, central
and southern corridors

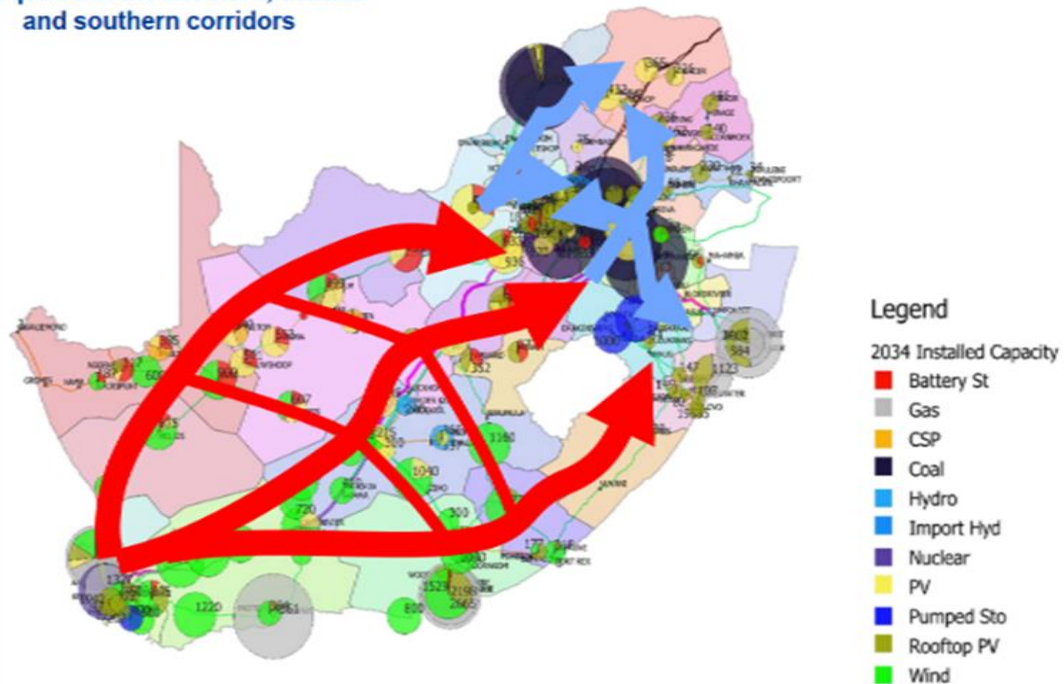


Figure 4-11 – Proposed Transmission Corridors within South Africa

Transmission Losses^{96,97}

Transmission losses refer to the reduction in electrical energy as it travels from the plant through the transmission and distribution network to end users. While nuclear plants generate large amounts of electricity efficiently, some of that energy is inevitably lost due to resistance in transmission lines, transformer inefficiencies, and heat dissipation. Globally, transmission and distribution losses typically range between 6–8% of the electricity generated, depending on grid infrastructure and distance from generation sites to consumers. In the case of nuclear power, these losses are not unique compared to other generation sources—they are a feature of the electrical grid itself. Modern high-voltage transmission systems are designed to minimise these losses, but they remain an unavoidable factor in delivering electricity from any power station to homes and industries.

The current ESIA is limited to the generation facility and its connection to the high-voltage yard; transmission lines to the grid will be handled by a separate applicant (the National Transmission Company of South Africa (NTCSA)), and a separate ESIA will be required for those powerlines. The transmission corridors are considered in the site selection process to assess how they affect the project, creating an interlink between the generation facility and transmission planning.

⁹⁶ World Nuclear Association. (2020). Electricity Transmission Systems. London: World Nuclear Association.

⁹⁷ Jefferson, K. (2025). Unseen Losses: How Nuclear Power Stations Waste Energy. ShunWaste, December 9.

5 NEED AND DESIRABILITY

Section 24 of (NEMA) requires that the competent authority, when considering an application for environmental authorisation, to take into account the need and desirability of the proposed activity. This requirement, as guided by the 2017 DEA Guideline on Need and Desirability, is grounded in the principles of sustainable development, intergenerational equity, and the constitutional right to an environment that is not harmful to health or well-being.

The determination of need and desirability rests with the competent authority and extends beyond demonstrating an identified developmental or infrastructure requirement. It includes consideration of whether the proposed activity is appropriately located, timed and designed to achieve equitable and sustainable outcomes.

South Africa is faced with high electricity demands and a shortage in electricity supply. South Africa is the seventh-largest coal producer in the world, with approximately 77% of the country's electricity currently generated from coal. This large dependence on coal and its use has also resulted in a variety of negative impacts on the environment, including the contribution to climate change. South Africa is also the highest emitter of GHG in Africa; attributed to the country's energy-intensive economy that largely relies on coal-based electricity generation. However, according to IRP 2025, the country is progressively phasing out coal-fired power generation, lowering coal's share to under 45%, in favour of cleaner energy technologies. The plan sets a clear trajectory toward achieving net-zero emissions. This plan is also aligned with the JET goals.

Nuclear energy development is regarded as an important contribution to meeting international and national targets of reducing reliance on fossil fuels, such as coal, which contribute towards GHG emissions and resultant climate change.

This section sets out the need and desirability of nuclear power in South Africa, framed within international obligations, national policy frameworks, and electricity supply challenges. It further integrates national strategic context with local context for Overstrand Local Municipality (Western Cape) and Sarah Baartman District Municipality/Kouga Local Municipality (Eastern Cape).

5.1 INTERNATIONAL PERSPECTIVE

South Africa, as a UN Member State, adopted the 2030 Agenda for Sustainable Development in 2015 and implements the Sustainable Development Goals (SDGs) through national planning and regular country reporting led by Statistics South Africa and the UN system in South Africa. Among these goals, SDG 7 (Affordable and Clean Energy) calls for "ensuring access to affordable, reliable, sustainable and modern energy for all," with targets on universal access, increased renewable shares, improved energy efficiency, and infrastructure/technology upgrades. By providing long-lived, reliable, low-carbon electricity and supporting power-system stability and energy access, the proposed NPP is directly aligned with SDG 7 and, through system decarbonisation and industrial enablement, also supports SDG 9 (Industry, Innovation and Infrastructure) and SDG 13 (Climate Action). This alignment is consistent with South Africa's ongoing SDG implementation and reporting framework.

The proposed NPP will materially support South Africa's contribution to the Paris Agreement by adding long-lived, zero-operational-carbon, dispatchable capacity that reduces GHG emissions while maintaining security of supply. The Paris Agreement is a legally binding international treaty

adopted at COP21 in Paris on 12 December 2015; it aims to hold the increase in global average temperature well below 2°C and pursue efforts to limit it to 1.5°C. Achieving this requires rapid emissions reductions, with global peaking as soon as possible and a trajectory to net-zero around mid-century under the Agreement's ratchet mechanism for progressively stronger Nationally Determined Contributions (NDCs).

The NPP also advances an energy transition consistent with the Just Energy Transition Partnership (JETP) Political Declaration announced at COP26 (November 2021) between South Africa and the International Partners Group (EU, France, Germany, the UK and the USA), which mobilises concessional financing to accelerate power-sector decarbonisation while protecting workers and communities. The partners formally endorsed South Africa's JET Investment Plan at COP27 (November 2022).

International policy momentum has strengthened the investment case for nuclear. In July 2022, the European Parliament approved the EU Taxonomy Complementary Climate Delegated Act, recognising nuclear (and gas, under conditions) as sustainable transitional activities—an important signal to capital markets. At COP28 (December 2023), 25 countries launched a Declaration to triple global nuclear capacity by 2050; by COP29 (2024) the number of endorsing countries had risen to 31, and by late-2025 to 33, reflecting expanding governmental support, including in Africa.

Operational data underscore nuclear energy's decarbonisation impact and reliability. Global nuclear generation reached a record 2 667 TWh in 2024, with an average fleet capacity factor of ~83%—performance that avoided an estimated ~2.1 billion tonnes of CO₂ versus coal-fired generation and underpinned power-system stability. In 2024, seven reactors were connected to the grid (China ×3, USA, India, France, UAE), nine construction starts were recorded (China ×6; Pakistan, Egypt, Russia), and ~70 reactors were under construction worldwide⁹⁸.

Note: Published international sources characterise the status and trajectory of the global nuclear industry differently, depending on the indicators and timeframes applied. While the Scoping Report refers to recent indicators such as generation output, capacity factor and current construction activity, other published sources place greater emphasis on reactor fleet size, long-term outages, ageing infrastructure, historical closure trends and the concentration of new build activity in a limited number of countries. The industry context should therefore be understood as mixed rather than uniform. This broader context does not alter the site-specific purpose of the current EIA, but is noted to ensure that the competent authority is aware that differing interpretations of international nuclear industry trends exist in the available literature.

⁹⁸ World Nuclear Association. (2025). World Nuclear Performance Report 2025. Available at: <https://world-nuclear.org/news-and-media/press-statements/world-nuclear-performance-report-2025-nuclear-delivers-record-breaking-year-in-electricity-generation#:~:text=Three%20of%20these%20were%20located,in%20Pakistan%2C%20Egypt%20and%20Russia.>

5.2 NATIONAL PERSPECTIVE

5.2.1 NUCLEAR ENERGY POLICY FOR THE REPUBLIC OF SOUTH AFRICA (2008)

According to the Nuclear Energy Policy for the Republic of South Africa (June 2008), the policy establishes the national framework governing the prospecting, mining, milling, and use of nuclear materials, including uranium, as well as the development and peaceful utilisation of nuclear energy in the country.

The policy's vision, as stated in the document, is to achieve industrial and technological leadership and secure alternative energy resources for the future by building "a globally competitive infrastructure and skills for the peaceful utilisation of Nuclear Energy and Technology".

The policy notes that nuclear energy plays an important role in reducing GHG emissions, especially when considering the full lifecycle emissions compared to fossil fuels. Although the document highlights environmental protection as a key consideration, it does not quantify lifecycle emissions reductions; instead, it affirms nuclear energy's strategic value within a lower-carbon emission energy system.

South Africa's ongoing energy and environmental challenges—such as ensuring system reliability and meeting environmental objectives—underscore the need for a diversified energy portfolio, which the policy supports.

Section 9 of the policy outlines the policy principles guiding South Africa's long-term nuclear energy vision. The principles from Section 9 of the Nuclear Energy Policy for the Republic of South Africa (2008) are outlined in Table 5-1.

Together, these principles emphasise that nuclear energy is not only a tool for strengthening national energy security but also a strategic component for transitioning to a more sustainable and lower-carbon emission energy system.

Table 5-1 – Principles of the Nuclear Energy Policy, 2008

Principle	Description
Diversification and Energy Security	Nuclear Energy shall be used as part of South Africa's diversification of primary energy sources and to ensure security of energy supply.
Economic Growth and Technology Development	Nuclear Energy shall contribute to economic growth and technology development in South Africa through investment in infrastructure, creation of jobs and the further development of skilled workers.
Climate Change Strategy	Nuclear Energy shall form part of South Africa's strategy to mitigate climate change.
Environmental Consideration	All activities undertaken in pursuit of nuclear energy shall be in a manner that takes the environmental impact into account.
Legal and Regulatory Framework	All Nuclear energy sector activities shall take place within a legal regulatory framework consistent with international best practice.
Peaceful Use Only	Nuclear energy shall be used only for peaceful purposes and in conformity with national and international legal obligations and commitments.

Principle	Description
Nuclear and Radiation Safety Priority	In pursuing a national nuclear energy programme there shall be full commitment to ensure that nuclear and radiation safety receives the highest priority to provide for the protection of persons, property and the environment.
Sustainable Uranium Resource Use	South Africa shall endeavour to use uranium resources in a sustainable manner through the recognition of the three interdependent and mutually reinforcing pillars of sustainable development namely economic development, social development and environmental protection. To the extent possible technologies chosen for Nuclear Power plant shall be those that allow for optimum utilisation of uranium resources including the use of recycled uranium.
Institutional and Human Resource Development	Government shall encourage the development of appropriate institutional arrangements and thereby ensure the development of human resources competent to discharge the responsibility of managing a nuclear infrastructure.
Technology Know-How and Industrial Base	South Africa shall strive to acquire technology know-how and skills to enable design, development, construction and marketing of its own nuclear reactor and fuel cycle systems. To this end an industrial support base for the nuclear sector shall be developed as appropriate, taking into account the scale of the national programmes. Technology transfer shall be optimised in any procurement of nuclear and related equipment.
Safeguards and Security	All facets of the nuclear energy sector shall always be subjected to appropriate safeguards and security measures in conformity with South Africa's international obligations.
Support for R&D and Innovation	Government shall support research, development and innovation in the use of nuclear technology. Government shall also support participation in global nuclear energy technology innovation programmes.
Protection of IP Rights	Government shall put in place effective mechanisms to protect and safeguard the South African nuclear energy industry Intellectual Property rights and innovative technology designs.
Public Awareness Programmes	Government shall create programmes to stimulate public awareness and inform the public about the nuclear energy programme.
Funding Availability	Government will ensure that adequate funding will be made available to support the technology development initiatives that are essential to the implementation of this policy. Although the Nuclear Energy Policy aims for the development of a globally competitive infrastructure price support mechanisms can be implemented to enable the ongoing operations of key technologies.
Fleet Procurement Approach	Government shall endeavour to implement a fleet approach to power reactor procurement which is needed to optimise the industrialization process and ensure economy of scale.

These principles collectively guide South Africa's nuclear energy strategy, balancing energy security, economic development, safety, sustainability, technology development, and international obligations.

5.2.2 WHITE PAPER ON ENERGY POLICY IN SOUTH AFRICA 1998

The White Paper on Energy Policy was approved by the South African Cabinet in December 1998. It was developed through a comprehensive consultation process that began with the publication of an Energy Policy Discussion Document in 1995. The 1998 White Paper on Energy Policy in South

Africa outlines key objectives aimed at increasing access to affordable energy services, improving governance, and managing environmental impacts.

The Nuclear Energy Policy (June 2008) is guided by the White Paper on Energy Policy, where it was retained as one of the policy options for electricity generation. As part of national policy, government also encouraged a diversity of both supply sources and primary energy carriers. In terms of the White Paper, the government investigates the long-term contribution nuclear power can make to the country's energy economy and how the existing nuclear industrial infrastructure can be optimised. The Nuclear Energy Policy (June 2008) outlines the vision envisaged in the White Paper. Some of the main policy objectives relate to decisions regarding possible new nuclear power stations, the management of radioactive waste, safety monitoring of the nuclear industry, effectiveness and adequacy of regulatory oversight, and a review of bodies associated with the nuclear industry.

5.2.3 NATIONAL DEVELOPMENT PLAN 2030

The NDP 2030 provides South Africa's long-term strategic vision for eliminating poverty and reducing inequality by 2030. Central to this vision is the creation of a more inclusive, resilient, and sustainable economy supported by strong infrastructure systems and an effective state. The NDP 2030 emphasises a diversified, secure, and sustainable energy mix, promoting renewables (solar, wind, hydro) and clean coal, while calling for a thorough investigation into nuclear energy's costs, financing, safety, and benefits as a potential baseload option, rather than an immediate commitment, though government policy has shown interest in nuclear procurement alongside a JET to meet climate goals and ensure energy security, job creation, and industrial development.

Key energy priorities highlighted by the NDP:

- Energy security – ensuring adequate, reliable supply to avoid economic disruption.
- Renewable energy – expanding solar, wind, and hydro to provide significant new capacity (e.g., 20 000 MW).
- Diversification – moving beyond coal, including exploring gas and cleaner coal technologies.
- Energy efficiency – implementing measures in buildings and transport.
- Access – aiming for 95% population access to electricity (grid/off-grid).
- JET – managing the shift to renewables without harming workers or communities, focusing on job creation and localisation.

5.2.4 INTEGRATED RESOURCE PLAN (2025)

While the NDP calls for investigation, subsequent government discussions, including the updated IRP of 2025, have reframed nuclear as part of a broader strategy alongside renewables and green hydrogen for a JET, with a focus on local capacity.

The IRP is a living plan for reliable power that is expected to be regularly reviewed, as necessitated by changing circumstances. Primarily, the IRP ensure security of electricity supply necessary by balancing supply with demand, while optimising the environmental impact and total cost of supply. South Africa continues to pursue a diversified energy mix that will provide security of supply while ensuring compliance with its emission reduction plan. South Africa's approach to energy security is in line with international trends and developments.

The IRP 2025 seeks to achieve security of electricity supply in South Africa – planning for adequate capacity to satisfy electricity demand and a power system that can endure contingencies or disruptions without interrupting supply.

The IRP 2025 aims to minimise the cost of electricity to the economy – least cost power system planning, subject to certain constraints (environment, lead times, etc); and the environmental impact of electricity supply – planning for reduction in global and local emissions while achieving the above objectives.

The current installed electricity generation capacity of the country is depicted in Figure 5-1, that also indicates that coal still dominates the current energy mix, but the clean technologies' share is growing fast.

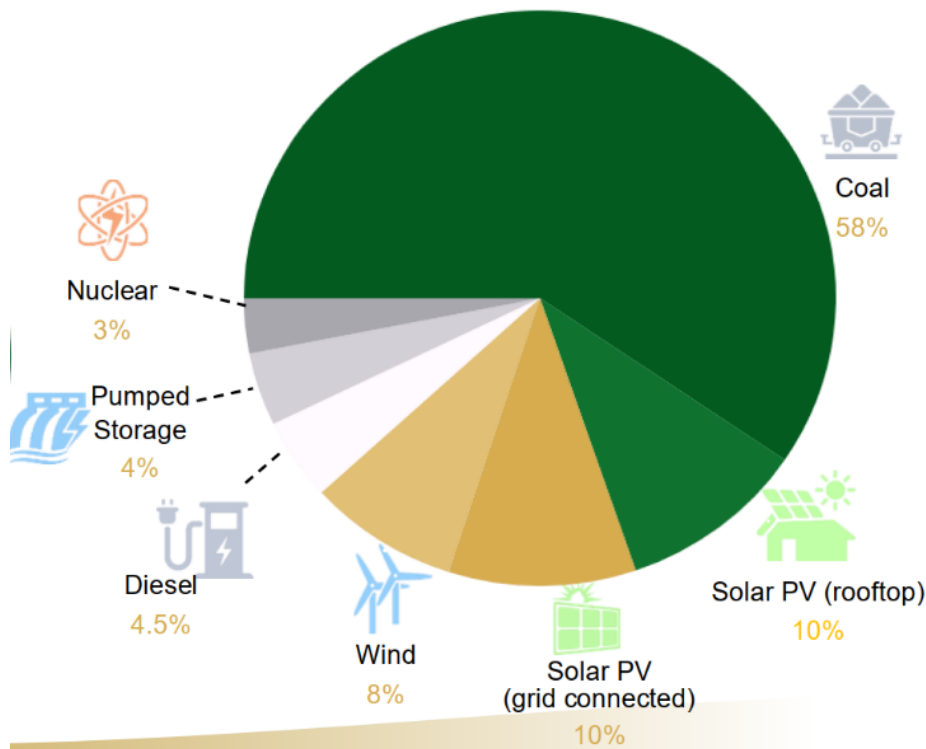


Figure 5-1 – Current Installed Electricity Generation Capacity

5.2.4.1 Projected Installed Electricity Generation Capacity (2039)

The proposed new electricity generation capacity by 2039, according to the IRP 2025, is depicted in Figure 5-2.

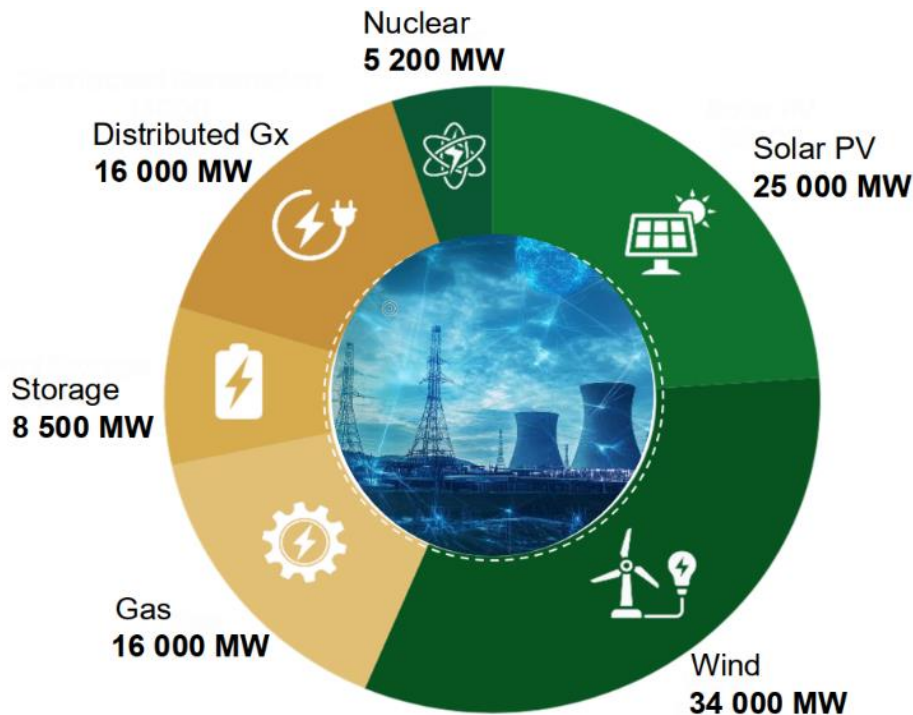


Figure 5-2 – Proposed New Electricity Generation Capacity by 2039

The IRP 2025 projects more than 105 000 MW of new generation capacity by 2039 that includes 5 200 MW of new nuclear generating capacity. The Nuclear Industrialisation Plan, as part of the IRP 2025, will determine the merits to expand the target to 10 000 MW new nuclear generations capacity. A case for 10 000 MW of nuclear rests on the economic viability of re-establishing the nuclear fuel cycle, using nuclear for both power and industrial applications (non-power). This case will be elaborated further in the Nuclear Industrialisation Plan.

According to the IRP 2025, the projected installed Energy Generation Capacity in 2039 is presented in Table 5-2.

Table 5-2 – Projected Installed Electricity Generation Capacity (2039)

TECHNOLOGY TYPE	CAPACITY (MW)	PERCENTAGE (%)
Coal	40 960	27
Wind	35 980	24
Solar PV	27 160	18
Gas	17 005	11
Distributed Gx	11 560	8
Nuclear	7 060	5
Storage	6 300	4
Pumped Storage	4 060	3
Hydro	1 600	1
CSP	600	<1

5.2.4.2 The Energy Availability Factor (EAF)

The Energy Availability Factor (EAF) measures the share of a power plant's maximum potential output that is actually available to the grid, excluding periods of planned or unplanned outages under a partial rollout of the generation recovery plan. According to the IRP 2025, South Africa's forecasted electricity demand reaches approximately 255 TWh by 2029. It assumes the EAF will increase from 66% in 2025 to 68% by 2030, enhancing the country's ability to meet demand reliably.

A higher EAF means that more electricity generation capacity is available to meet the country's electricity demand. The robustness enables the power network to better absorb shocks from emergencies or unexpected outages, thereby reducing the frequency and severity of load-shedding events.

Maintaining a stable electricity supply fosters investor confidence and supports sustained economic growth, as businesses rely on predictable power to operate effectively. In essence, improving EAF is vital to unlocking additional economic potential by ensuring a resilient and reliable energy system. Globally, NPPs achieve very high EAF, far exceeding most other generation types.

5.2.4.3 Minimising Environmental Impact while Securing Supply

The IRPs objective is to ensure security of electricity supply while minimising environmental impact due to electricity generation. South Africa continues to pursue a diversified energy mix that will provide security of supply and ensure compliance with its emissions reduction plan, which aligns with global trends and developments of reducing emissions, paving the path towards a net-zero future. The IRP 2025 projects emission to approximately 168 MtCO₂eq by 2030 and to decline further to 142 MtCO₂eq by 2035.

In this context, nuclear power strengthens environmental outcomes by providing very low life-cycle GHG emissions and high availability, which raises system EAF, reduces the risk of load-shedding, and enables deeper renewable integration—thereby supporting a diverse, balanced and greener energy future consistent with the IRP and national climate policy.

5.2.4.4 Reserve Margin

South Africa's power system has experienced persistent generation shortfalls, directly contributing to the frequent load-shedding cycles. In 2023, South Africa witnessed its longest recorded hours of load shedding, with the power being off for 6 800 hours during the year, as depicted in **Figure 5-3**.

Data as of May 10, 2023 at 17:00

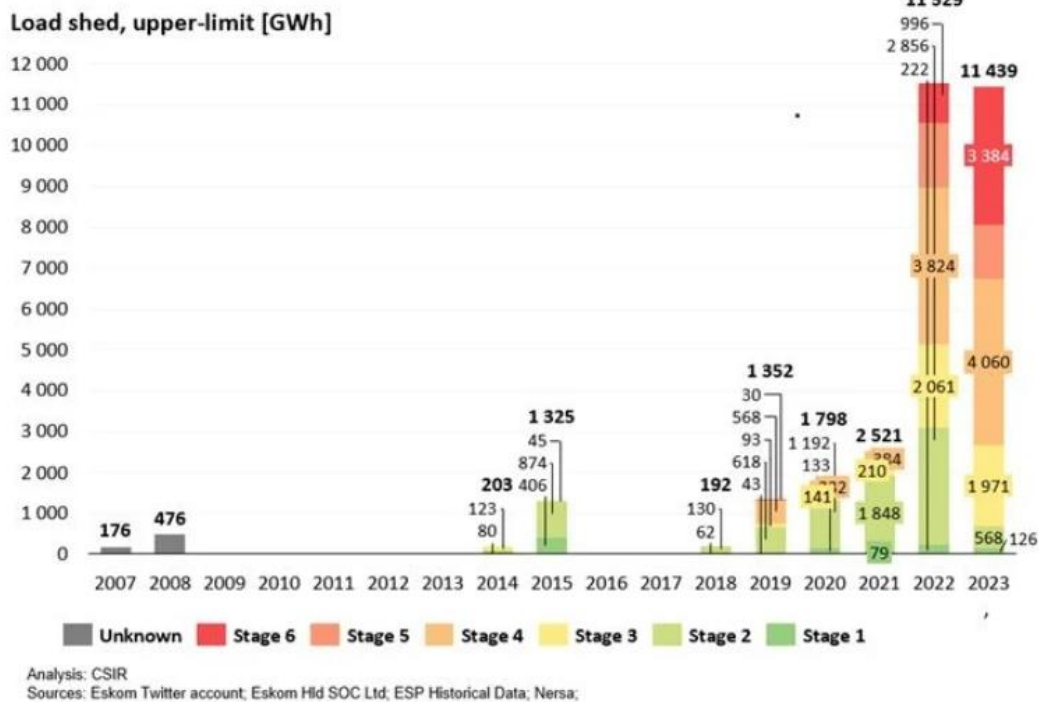


Figure 5-3 – Load-shedding hours over the years in South Africa⁹⁹

A “reserve margin” is the extra electrical generation capacity a power system has beyond its expected peak demand, acting as a crucial buffer to ensure reliability by covering unexpected outages, sudden demand spikes, or extreme weather, calculated typically as (Available Capacity – Peak Demand) / Peak Demand, expressed as a percentage, to prevent blackouts. Maintaining an adequate margin balances the cost of excess capacity with the risk of supply shortages, with targets varying by region and regulated by entities like National Energy Regulator of South Africa (NERSA).

Furthermore, the reserve margin—the gap between peak power demand and available generating capacity—has historically fallen below the internationally accepted 15% level, often dipping to 8–10%, which has contributed to chronic load shedding. Nuclear energy is considered a critical, stable baseload component of this margin, with the current existing nuclear facility, Koeberg, providing roughly 5% of the national electricity mix.

5.2.5 NUCLEAR POWER ALONGSIDE RENEWABLE ENERGY IN SOUTH AFRICA

As per the IRP 2025, South Africa’ energy transition requires a balanced, low-carbon, and reliable energy system. While renewable energy sources such as wind and solar are indispensable for decarbonisation, they cannot alone provide the stability and continuity needed for a secure national grid. Renewables remain intermittent and weather dependent, with an EAF significantly lower compared with nuclear and an intermittency that requires large-scale storage or backup generation.

⁹⁹ Eskom Twitter Account. (2023). Eskom Holdings SOC Ltd; ESP Historical Data; NERSA

Nuclear power is the only clean baseload power source with a high EAF (far higher than renewables), ensuring consistent supply regardless of weather conditions. The IAEA emphasises that nuclear power enhances grid stability and resilience, enabling the integration of intermittent renewables.

The argument is not nuclear versus renewables, it is nuclear plus renewables; each playing a unique, mutually reinforcing role. Renewables contribute by reducing emissions rapidly due to fast deployment rates, lowering system marginal costs when generation is available, and diversifying and decentralising the energy landscape. On the other hand, nuclear power provides round-the-clock, high capacity, low-carbon baseload, supports grid stability to enable higher renewable penetration, and ensures long-term energy security as coal retires.

5.3 REGIONAL AND LOCAL PERSPECTIVE

5.3.1 JUST ENERGY TRANSITION

The JET is described as the transition towards a low-carbon and climate-resilient economy that maximises the benefits of climate action while simultaneously improving the welfare of the workers and their communities.

The NPP project will pave the way for the JET in South Africa and promote the transition from a fossil fuel-based economy to a low carbon economy. South Africa is the seventh-largest coal consumer in the world and the leading African carbon emitter, with 435.9 million metric tons of carbon emitted in 2022. South Africa heavily relies on coal to fire up 30 000 MW of electricity, which serves an estimated 80% of the country's energy needs. Thus, a key factor to ensuring the success of the JET is not only to focus on the transition from fossil fuels to renewable and nuclear energy resources but to simultaneously ensure the Just Transition of jobs and skills.

NPPs contribute to socio-economic development beyond energy generation. The project will offer long-lived infrastructure with stable operating costs, provide high-skilled employment, industrial localisation opportunities and technology development.

5.3.2 SPATIAL DEVELOPMENT AND GOVERNANCE FRAMEWORKS

Table 5-3 highlights the relevant planning and development frameworks within the respective district and local municipalities of both the Bantamsklip and Thyspunt sites.

Table 5-3 – Planning and Development Frameworks

Area	Municipality	Planning and Development Frameworks	Description
Bantamsklip (Western Cape)	Overberg District Municipality	Overberg District Municipality 5 th Generation Integrated Development Plan (IDP) 2022/23 – 2026/27	The Overberg District Municipality's IDP is a five-year strategic document outlining the municipality's approach to resource allocation, service delivery, and addressing poverty, inequality, and unemployment. The plan focuses on five strategic goals: well-being and infrastructure, regional economic development, institutional development, financial viability, and good governance. Strategic Goal 1 (SG1) aims to ensure the well-being of all in the Overberg through the provision of efficient basic services and infrastructure, including electricity. 93.0% of the municipality uses electricity as primary source of lighting. The IDP identifies load-shedding as a significant strategic risk hindering economic growth and stability. The plan includes an Electricity Blackout Tactical Plan and an Eskom Emergency Strategic Plan. The key primary sectors in the municipality are agriculture, forestry and fishing, and mining and quarrying. The key secondary sectors in the municipality are manufacturing, electricity, gas and water, and construction. In terms of Local Economic Development (LED) in the municipality, the key strategies include the implementing deliverables of RED and Tourism Strategy, job creation initiatives and SCM/LED initiatives.
		Overberg District Spatial Development Framework (SDF) 2023	According to the SDF, the electricity network has failed to keep pace with demand. Because of load-shedding, the district experienced reduced revenue through the sale of electricity and increased maintenance and operational costs (especially diesel costs and the rental of generators) over the recent years. This has also resulted in water restrictions due to limiting water abstraction from boreholes and limited transfer of water between reservoirs. The Department of Environmental Affairs (DEA) has committed to contribute to the implementation of the National Development Plan and National Infrastructure Plan by undertaking Strategic Environmental Assessments (SEAs) to identify adaptive processes that integrate the regulatory environmental requirements for Strategic Integrated Projects (SIPs) while safeguarding the environment, including renewable energy and gas. In 2022/23, the allocations for the Electricity functions totals to R104.93 million. The largest allocations are allocated to the Overstrand area, with budgets of R65.4 million for electricity.

Area	Municipality	Planning and Development Frameworks	Description
	Overstrand Local Municipality	Overstrand Integrated Development Plan Review 2025/2026 ¹⁰⁰	The Overstrand Municipality IDP sets the five-year strategic trajectory, programmes and service priorities (including bulk services, resilience and disaster management), providing a formal route to integrate enabling bulk infrastructure, off-site upgrades, and mitigation measures associated with large strategic projects. The IDP Review allocates over R60 million for electrical infrastructure, including funding for a new substation in Hermanus and upgrades across several areas. The plan also includes providing indigent support with subsidies and increased free basic electricity. In terms of LED, Overstrand is the second largest contributor in the district with the lowest per capita income in the district. Trade, Manufacturing and Finance are the top performing sectors in the municipality. There is strong indication that the Tourism industry plays a huge role in growth. Overstrand is a popular destination for both local and international visitors with over 900 accommodation establishments and a host of international standards tourism products. Currently, the electricity, gas and water sector accounts for 24.1% of the municipality's low-skilled workforce and 57% semi-skilled. The main challenges faced within the municipality is unemployment, veld fires, load shedding impact on the local economy, floods and inclement weather patterns, and uncontrolled in migration and urbanisation. The shortage of electricity has a negative impact on the local economy in terms of cost of doing business, damage to perishable goods, time on delivery of goods and services, communication breakdown, connectivity losses, cost of fuel for power generation etc. The strain on local business will impact negatively on consumers and unemployment. The electricity crisis will intensify in the foreseeable future, and the implications thereof will have a severe impact on Small Micro Medium Enterprises (SMMEs). Certain areas in the Overstrand Local Municipality have an Electricity Master Plan (EMP), the closest being Gansbaai. Critical issues addressed in EMP are to make provision for future upgrades and improve networks; and to comply with all relevant legislation.

¹⁰⁰ Overstrand Integrated Development Plan (IDP) Review 2025/2026. Final 29 May 2025. 3rd review (2025/26) and amendment of amendment. 5-year IDP in terms of Section 34 of the Municipal Systems Act (MSA), 2000.

Area	Municipality	Planning and Development Frameworks	Description
		Overstrand Municipality Spatial Development Framework (May 2020)	The Overstrand Municipality SDF is the statutory spatial policy guiding land use, settlement form and infrastructure integration in Overstrand, and is to be applied in municipal decision-making. It supports evaluation of strategically located infrastructure led investment provided it is consistent with environmental management and coastal systems policies. Accordingly, the existing available bulk electricity supply in the Bantamsklip area and surrounds is deemed unreliable. In terms of energy management and provision, and in line with the Overstrand Electrical Master Plans and the Overstrand LED Principles and Strategies (2019/23), the municipality aims at continuing with current electricity provision projects, and the maintenance, upgrade and development of the Overstrand's electrical infrastructure networks in conjunction with Eskom. Furthermore, the municipality proposes implementing alternative energy provision projects and demand side management (DSM).
Thyspunt (Eastern Cape)	Eastern Cape Province	Eastern Cape Vision 2030 Provincial Development Plan (PDP)	Reference is made to Strategic action 4.3.2: Ensure adequate energy infrastructure for household and public facility access, of the Eastern Cape PDP, as follows: There are still vast areas in rural Eastern Cape where households do not have access to electricity. It will take an estimated eight to nine years before the province has universal electricity access for existing dwellings. When new dwellings are included, it will take an estimated 15 to 20 years to address the combined backlogs in the province. New investments in the electricity transmission and distribution networks are required to accommodate new generation capacity and strengthen grid capacity. This will improve network performance, network flexibility and the quality of supply for both economic and social activities. The following interventions are proposed: ■ Ensure universal access to energy by 2030: Alleviate energy poverty and resultant socioeconomic consequences in remote rural areas through sustainable energy initiatives. Economics may dictate that off-grid solutions are necessary. Renewable energy hubs for remote rural areas are a potential solution, using solar, wind and biomass/biogas as a resource. Promote energy-efficient homes to improve health and well-being, but also enable the adequate, affordable provision of energy services to communities. ■ Increase network capacity available for household use and free basic electricity: New investments in the transmission and distribution networks are needed to meet the current and future demand for household electricity and free basic electricity for indigent households, particularly in the OR Tambo, Alfred Nzo regions, and parts of Amathole.

Area	Municipality	Planning and Development Frameworks	Description
			Eskom's plans to strengthen the transmission grid with a new high voltage transmission line (Eros) between KwaZulu-Natal and Eastern Cape should be expedited. - Promote energy efficiency. Although provincial government has an indirect role in terms of influencing and promoting energy efficiency among energy consumers, it can: - Send a clear message to consumers by setting energy-efficiency targets. - Support local government in promoting and enforcing energy efficiency. - Enforce energy-efficiency standards when developing new provincial infrastructure. - Give preference in the province's facilities rental procurement policy to energy-efficient facilities. - Develop efficient permission and planning processes for developers and promote clear planning guidelines, particularly for municipalities. - Promote pilot and demonstration projects. - Set an example by implementing energy efficiency within its own facilities, development projects and other spheres of influence. Furthermore, the PDP includes reference to nuclear power generation as follows: Strategic action 1.1.6: Position the province as a key investment hub in the energy sector and ensure reliable energy supply to high-potential sectors. The province is positioning itself as an investment hub in the energy sector (wind farms, imported liquefied natural gas, shale-gas and nuclear energy). This will provide opportunities to develop the capital goods sector and heavy industries. This new investment could become a major catalyst for provincial economic development, particularly if the benefits and costs are well managed. Strategic action 1.2.3: Use infrastructure investment to promote more equitable regional development. New infrastructure investment is crucial for shaping regional development. Each of the eight regions has at least one mega-project in the pipeline. Sarah Baartman District Municipality (then Cacadu DM) is referenced for a nuclear plant.
	Sarah Baartman District Municipality	Sarah Baartman District IDP 3 rd Review (2025–2026)	The IDP emphasises infrastructure coordination, economic development and resilience, establishing the policy platform for inter-municipal projects with significant grid, transport and skills impacts. The IDP highlights disaster risk reduction, infrastructure reliability and economic resilience, which are directly relevant to the evaluation of strategic energy infrastructure with long operating lives and high availability requirements. Goal (Impact Area) 2: An Enabling Infrastructure Network prioritises sustainable energy and electricity provision. Access to electricity has increased from 87,3% in 2011 to 95,2% in 2022. Although most of the communities of most Local Municipalities have direct access to electricity, a significant capital outlay is envisaged in order to upgrade both the urban and rural networks.

Area	Municipality	Planning and Development Frameworks	Description
			To ensure rapid economic development by providing electricity to all communities, the municipality aims to develop an Electricity Master Plan (EMP). The municipality however notes that the provision of bulk electricity to the sparsely populated interior remains expensive. A strategic priority in the municipality includes LED initiatives. This will be achieved through targeted investment promotion to grow strategic sectors that are able to create employment opportunities on a substantial scale in the short to medium term, and more advanced industries that are crucial for long term economic growth. Specific sectors earmarked for further development in the district include: ■ Green economy (including, but not limited to renewable energy and ecosystem services) ■ Tourism ■ Skills development and Education (predominantly, but not exclusively further education and training) ■ Agriculture and agro-processing The district will spearhead the facilitation of intervention within these strategic sectors in the areas of: ■ Identification and appropriate packaging and promotion of investment opportunities. ■ Targeted support to SMMEs to broaden economic participation ultimately assimilate emerging enterprises into developing and established value chains. ■ Investment in enabling infrastructure and the promotion of infrastructure connectivity required for economic growth and development.
		Sarah Baartman District Development Model (DDM) ('One Plan' for Sarah Baartman) (2025)	The DDM serves as an operational framework to enhance cooperative governance and build a capable, ethical, and developmental state. It promotes collaboration among the three spheres of government and state entities, ensuring better coordination, accountability, and impact-driven service delivery. The model is designed to help the state effectively address the triple challenges of poverty, unemployment, and inequality. Infrastructure planning will begin with audits, community engagements, and mapping of bulk needs, alongside waste management improvements and urgent road repairs. By 2030, waste systems, internet connectivity, and renewable energy integration will advance. By 2050, the district aims to achieve major infrastructure upgrades, expanded internet penetration, new road and rail networks, and a stable power supply. The electricity sector experienced the highest growth in 2024 at 3.1%, while it recorded the lowest growth of -7.4% in 2020. When looking at the number of households with no electrical connection over time, in 2009 the households without an electrical connection in the municipality was 22 600, this decreased annually at - 9.16% per annum to 8 660 in 2019. In a poor district like Sarah Baartman, the increasing costs of electricity will have a negative impact for businesses and households.

Area	Municipality	Planning and Development Frameworks	Description
			The long-term goal is for bulk, upgrading of infrastructure, streetlights, high mast, and conversion to prepaid. A strong economic foundation will be built through key policies, investment strategies, and support mechanisms for SMMEs, the informal sector, and priority sectors such as the oceans economy and renewable energy. By 2030, investment levels, broadband access, and business participation are expected to grow. By 2050, the district envisions a thriving economy with expanded SMMEs, increased women, youth, and disability-owned enterprises, improved infrastructure, and broader digital connectivity.
	Kouga Local Municipality	Kouga IDP (2024–2025 and 2025–2026)	In Kouga, the current IDP cycle and associated process plans explicitly prioritise reliability of municipal services, infrastructure upgrades (roads, wastewater, electricity) and reducing reliance on constrained supply, indicating a policy environment focused on security of supply and enabling new generation and grid-supporting infrastructure within the municipal area. According to the IDP, the municipality is the registered electricity supply authority for the towns of Humansdorp, Jeffreys Bay, St. Francis Bay, Cape St. Francis, and Oyster Bay. In each of these towns, bulk electricity supply is sourced from the Eskom grid. The municipality is responsible for maintaining the internal distribution networks under NERSA's approved EC 108 licence. The Municipality is responsible for constructing, operating, and maintaining the electrical distribution network, providing service delivery to residential, commercial, and industrial consumers within these towns. Additionally, the municipality supplies and maintains street lighting and pump stations with electricity. The electricity related challenges faced by the municipality include the following: ■ Staff: Critical shortage with skilled and experienced staff. ■ Vehicles: Shortage of effective and efficient vehicles to perform the duties especially access to difficult terrain. ■ Training: Technology change constantly and staff need to be skilled to keep up with the latest technology and to be in compliance. ■ Vandalism and cable theft: Safety and security to be prioritised. Costly infrastructure damage occurs regularly resulting in extended power failures and environmental pollution. ■ Loadshedding: Critical to manage to prevent network damage, this requires great human resources, as a result, fatigue occur amongst staff. It also causes higher than average faults and network failures. ■ Regulatory requirements: The department is regulated and require the necessary regulatory requirements to be adhered to. ■ Office Accommodation: The department staff is scattered; proper coordination cannot be maintained due to staff separation.

Area	Municipality	Planning and Development Frameworks	Description
			Infrastructure development: Infrastructure does not receive the necessary upgrades due to budget allocations, higher budget allocations to be provided in order to upgrade networks. The second strategic target of the IDP is to incrementally implement its renewable energy strategy with its main objective of avoiding load shedding and saving money on expensive Eskom electricity tariffs. The main project of this strategy is the construction of a 20 MW solar plant in Humansdorp. Kouga aims to become a renewable energy hub for South Africa. The IDP also highlights that the Thyspunt site, west of Cape St Francis has been acquired by Eskom for possible future power generation purposes. As a result, the Kouga Coast Sub-Regional Structure Plan was prepared based on the need to maintain the viability of the Thyspunt site for possible future nuclear power generation. The Kouga Municipality SDF takes into cognisance the spatial impact of this megaproject in the pipeline and a phased approach towards state of readiness is thus required from a forward planning point of view should this project become a reality. The IDP also focuses on creating a conducive environment for investment and LED by broadening stakeholder participation in economic activities and focusing on SMME development and leveraging local environmental assets to attract investment and foster sustainable livelihoods.
		Kouga Local Municipality SDF (2020)	The Kouga Municipal SDF defines Kouga's spatial policies, environmental and coastal management parameters, and implementation mechanisms under Spatial Planning and Land-Use Management (SPLUMA), thereby setting out where and how major infrastructure can be integrated with settlement and environmental systems. The SDF sets policy for integration of major infrastructure with settlement systems and ecological assets, and, together with Kouga's current IDP, prioritises service reliability and systemic upgrades—key determinants of desirability for firm, grid-supporting capacity and associated transmission works. According to the SDF, the formal areas in the municipality has access to electricity and street lighting, and the informal areas have access to electricity, street lighting or high mast lights. 86.9% of households have access to electricity. In terms of electrical services, the following key issues have been identified through the IDP process: - There are major challenges in electricity services. - Upgrade of infrastructure (primary network) to meet demand and finding the necessary funds through grants etc. is required. - Master planning and stringent programmes to implement upgrading measures is needed. - A review of augmentation levy (contribution by new developments and existing consumers requiring upgrading of their supplies to augment the primary network) and consumptions tariffs to meet capital programme to upgrade infrastructure.

Area	Municipality	Planning and Development Frameworks	Description
			- The Kouga Municipality has adequate capacity to deliver electricity in the short term but the following main electricity infrastructure network, the 66Kv overhead line between Eskom's Melkhout Substation at Humansdorp and the Municipality's Main Intake Substation at Jeffreys Bay need attention. The SDF specifically identifies the Thyspunt site as a possible future nuclear power generation site. The SDF states the following: The Thyspunt site, west of Cape St Francis has been acquired by Eskom for possible future power generation purposes. As a result, the Kouga Coast Sub-Regional Structure Plan was prepared based on the need to maintain the viability of the Thyspunt site for possible future nuclear power generation. With respect to the Thyspunt site, the following land use principles apply: To ensure the viability if the Thyspunt site for future possible power generation, development of the surrounding areas must be carefully managed. - Any proposed changes to current land uses, in terms of standard rezoning procedures within the 16km monitoring and emergency zone, must be brought to the attention of Eskom Nuclear Sites Department at Koeberg Nuclear Power Station, for their consideration and comment. - Urban expansion of Oyster Bay and Umzamowethu, which falls within the 0-5km zone should not be permitted. - The provision of a small school (without a hostel) to cater for local children may be supported in Oyster Bay. - Institutional land uses such as prisons, old age homes and hospitals that may result in the concentration of a resident population should not be developed within 16km of the Thyspunt site, because of potential evacuation difficulties. - No new food processing plants to be allowed to be developed within the 16km. - Agricultural activities to be monitored within 16km.
		Draft (Kouga) Municipal Spatial Development Framework (MSDF) Review (2024/2025)	According to the MSDF, the municipality has been the forerunner for the establishment of renewable energy projects, with specific reference to wind farms. Various projects are under construction or still subject to planning and bid processes in terms of the Renewable Energy Independent Power Producer Programme (REIPPP). These projects currently contribute significantly to the economy in the province and to renewable energy provision towards the national grid. Further development in renewable energy on a large scale will require the expansion and upgrading of Eskom's bulk infrastructure, as the infrastructure is at full capacity. In terms of electricity demand in the St Francis area, the projected maximum electricity demand of 5.46 MVA will strain existing supply networks and require upgrades in distribution capacity, substations, and load management systems. The growth in housing, commercial services, and tourism-related

Area	Municipality	Planning and Development Frameworks	Description
			developments will further increase electricity consumption, making energy efficiency and renewable integration key considerations for future planning. Furthermore, the MSDF specifically identifies the Thyspunt site as a possible future nuclear power generation site and highlights several requirements that should be adhered to in the Thyspunt area and surrounds. These are as follows: THYSPUNT NUCLEAR POWER STATION Development within the 16km monitoring and emergency zone of the Thyspunt site must be carefully managed to ensure the long-term viability of the site for possible future nuclear power generation. The following guidelines should be adhered to when considering new developments in this area: COMPLIANCE WITH REGULATORY AND ENVIRONMENTAL REQUIREMENTS ■ All development proposals within the 16km zone must comply with National, Provincial, and Local legislative frameworks, including environmental impact assessments (EIAs), land-use approvals, and nuclear safety regulations. ■ Any rezoning applications or changes in land use must be submitted to Eskom Nuclear Sites Department (Koeberg Nuclear Power Station) for review and comment before approval. RESTRICTIONS ON URBAN EXPANSION AND RESIDENTIAL DEVELOPMENT ■ Oyster Bay and Umzamowethu (0-5km zone): Urban expansion is to be restricted to prevent increasing population density near the nuclear site. ■ No institutional land uses (e.g., prisons, hospitals, old age homes) should be developed within 550m of the Thyspunt site due to potential evacuation difficulties. ■ Limited educational facilities: A small school (without a hostel) may be allowed in Oyster Bay to serve local children, but large institutions should be avoided. ■ The development of new residential estates or settlements within the high-risk zone should be strongly discouraged to minimise evacuation challenges in the event of an emergency. INDUSTRIAL AND AGRICULTURAL LAND USE MANAGEMENT ■ No new food processing plants should be developed within 550m of the site to ensure food safety and contamination control. ■ Agricultural activities within 550m of the site should be monitored to assess potential risks related to radiation exposure or contamination. ■ Industrial and commercial developments within the 16km zone should prioritise non-sensitive land uses that do not attract large, permanent populations or require high-risk infrastructure. INFRASTRUCTURE AND SUPPORTING LAND USES

Area	Municipality	Planning and Development Frameworks	Description
			- Future bulk infrastructure planning should consider the potential development of the Thyspunt nuclear site, ensuring that water, electricity, and transport networks are sufficiently robust to accommodate both the power facility and surrounding communities. - Supporting land uses such as worker housing, social facilities, and service industries should be planned carefully, ensuring they are located at safe distances from the nuclear site while still supporting the regional economy. ENVIRONMENTAL AND DISASTER RISK CONSIDERATIONS - Development should align with international safety protocols for nuclear sites, including buffer zones, emergency evacuation routes, and environmental conservation measures. - Sensitive ecosystems in the coastal and wetland areas surrounding Thyspunt must be protected to avoid long-term environmental degradation.
		St Francis Bay Central Business District (CBD) Local Spatial Development Framework (LSDF), 2 nd Draft (Draft for Discussion and Public Participation Purposes), Report 1799E/04, May 2024	According to the St Francis LSDF: - There are small sections of electrical distribution networks in St Francis Bay that requires remedial work and upgrading. - St Francis Bay has a notified demand of 5MVA, while the actual demand is 6.195MVA, with no surplus available. - Cape St Francis has a notified demand of 0.9MVA, while the actual demand is 1.611MVA, with no surplus available. - The reticulation in Sea Vista needs to be upgraded to avoid losses. - There is a need to apply for increased capacity.
		Oyster Bay ¹⁰¹	- Oyster Bay has a notified demand of 0.7MVA, while the actual demand is 0.8MVA, with no surplus is available. - There is a need to apply for increased capacity.

¹⁰¹ It is the intention of the Kouga Local Municipality to prepare local spatial development framework (LSDF) plans for all settlements.

Area	Municipality	Planning and Development Frameworks	Description
		Kouga Local Municipality Draft Service Delivery and Budget Implementation Plan (SDBIP) 2025/2026	In terms of municipal planned delivery, key performance indicators include: - Limit unaccounted electricity to less than 16% as of 30 June 2026. - Provide free basic electricity to indigent households in terms of approved tariffs earnings.
		Kouga Local Municipality Integrated Economic Growth Strategy 2024-2028	The Strategy recognises that inclusive economic growth can contribute to the alleviation of existing poverty and inequality as well as the improvement of livelihoods for current and future generations. The Strategy therefore represents a continuing commitment to growth that will be supported by an ongoing programme of implementation. Additional growth to earn more revenue from external markets requires the implementation of following key interventions: - Retain large existing exporting businesses - Promote Aquaculture-, Fishing-, and Food processing sectors; - Tourism growth; - Attract new industrial investors by creating a more enabling environment; - Increase local enterprise share of local markets; - Support local SMME to access more opportunities; - Credible vocational skills development and tertiary education available; - A complex set of stakeholders that need to collaborate. The municipality identifies the sustainable electricity as a threat (SWOT analysis). The Municipality does not have a plan that determines the optimal energy mix for energy sustainability, highlighting that the plan should include various sources of energy generation types. The municipality thus recognised the need for the development of an Electricity Infrastructure Maintenance Plan and an Electricity Infrastructure Master Plan, with a potential solution of utilising technology to address the reduction / efficiency in electricity distribution.

Across both potential locations, the applicable planning and development frameworks:

- Prioritise service reliability, resilience and coordinated infrastructure investment, indicating institutional readiness to integrate strategic energy projects and their enabling bulk services.
- Provide inter-sphere implementation mechanisms to support delivery, oversight and alignment of sector budgets and approvals.
- Advance socio-economic objectives—employment, skills, localisation and investment attraction—aligned with the long-life nature of strategic energy infrastructure.

5.4 NEEDS AND DESIRABILITY GUIDELINES (GN 792 OF 2012)

The Needs and Desirability Guidelines, in terms of the EIA Regulations, Government Notice 792 of 2012, as amended, highlights the need to consider how the proposed project may impact ecosystems and biological diversity; pollution; and renewable and non-renewable resources. It should also consider how the development may affect or promote justifiable economic and social development. The Need and Desirability is further discussed in Table 5-4 and Table 5-5 respectively.

Table 5-4 – Part 1 – Need

Question	Response
Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved Strategic Development Framework (SDF) agreed to be the relevant environmental authority? Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occurs here at this point in time?	There are a number of SDFs associated with the project's area of influence (AOI). The Kouga SDF specifically identifies the Thyspunt site as a possible future nuclear power generation site and notes that the Kouga Coast Sub-Regional Structure Plan has been prepared based on the need to maintain the viability of the Thyspunt site for this purpose. According to the Overstrand Municipality SDF (May 2020), the existing available bulk electricity supply in the Bantamsklip area and surrounds is deemed unreliable. The municipality thus aims at continuing with current electricity provision projects, and the maintenance, upgrade and development of the Overstrand's electrical infrastructure networks in conjunction with Eskom. Furthermore, the municipality proposes implementing alternative energy provision projects and DSM. Both areas are in areas of environmental constraints, as discussed in Chapter 8. However, all efforts are being considered to ensure the avoidance of environmental constraints as far as possible. The land within the AOI for Bantamsklip is within a nature reserve and is a coastal dune environment, and the land within the AOI for Thyspunt is a CBA coastal dune environment. However, both sites can contribute to the stable electricity supply, with the Thyspunt area being earmarked for development within the LSDF and MSDF.
Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	South Africa is faced with significant increases in electricity demand and a shortage in electricity supply. South Africa is the seventh-largest coal producer in the world, with approximately 77% of the country's electricity generated from coal. This large dependence on coal and its use has also resulted in a variety of negative impacts on the environment, including the contribution to climate change. South Africa is also the highest emitter of GHGs in Africa; attributed to the country's energy-intensive economy that largely relies on coal-based electricity generation. Nuclear energy development is regarded as an important contribution to meeting international and national targets of reducing reliance on fossil fuels, such as coal, which contribute towards GHG emissions and resultant climate change.

Question	Response
	The need and desirability of the proposed NPP have been considered from an international, national, regional and local perspective.
Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development? Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	The Thyspunt site is situated in an area with easier access for transmission lines than the Bantamsklip site. The Bantamsklip area is more remote with less services available in the surrounding areas, with the Thyspunt site surrounded by St Francis Bay, Cape St Francis and Oyster Bay. In addition, Thyspunt is accessed by passing through the town of Humansdorp, located approximately 30 km away from the site. The NPP development is not included in the infrastructure planning for the Overstrand Local Municipality at the Bantamsklip site. The development would require additional infrastructure planning to ensure the NPP would generate and transmit at optimal levels. The Kouga IDP specifically identifies the Thyspunt site as a possible future nuclear power generation site and notes that the Kouga Coast Sub-Regional Structure Plan has been prepared based on the need to maintain the viability of the Thyspunt site for this purpose.
Is the project part of a national programme to address an issue of national concern or importance?	The proposed project does form part of a national programme. The NDP is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP also outlines the need to increase electricity production by 2030, with 20 000 MW of electricity capacity generated from renewable sources to move to less carbon-intensive electricity production. The plan also envisages that South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates, while supporting economic growth through job creation. Although the NDP does not specifically mention nuclear power, the IRP (2025) does – projects more than 105 000 MW of new generation capacity by 2039 that includes 5 200 MW of new nuclear generating capacity. The Nuclear Industrialisation Plan, as part of the IRP 2025, will determine the merits to expand the target to 10 000 MW new nuclear generations capacity. A case for 10 000 MW of nuclear rests on the economic viability of re-establishing the nuclear fuel cycle, using nuclear for both power and industrial applications (non-power). The proposed NPP will contribute to the JET in South Africa and promote the transition from a fossil fuel-based economy to a low carbon economy. The proposed NPP aims towards the aforementioned national energy targets of diversification of energy supply and the promotion of clean energy. Nuclear energy developments contribute to reduced emissions and subsequently climate change whilst promoting industrial development and job creation. The proposed NPP will also aid in overcoming the power shortages that are currently faced in the country. <u>It must be noted that Eskom lodged an application on 20 November 2025 with Infrastructure South Africa (ISA) to register the proposed NPP at the Thyspunt site as a Strategic Infrastructure Project (SIP) project. It is confirmed that Eskom received confirmation of SIP registration on 26 May 2026. There is an error in the confirmation letter in that it only refers to Thyspunt and not the nuclear program. A submission has been made to rectify the reference. Proof of the submission and registration is included in Appendix L.</u>

Table 5-5 – Part 2 – Desirability

Question	Response
Is the development the best practicable environmental option for this land/site?	Both areas are in areas of environmental constraints, as discussed in detail in Chapter 8. However, all efforts are being considered to ensure the avoidance of environmental constraints as far as possible. According to the Western Cape Biodiversity Spatial Plan (2023), the land within the AOI for Bantamsklip is within a protected area (nature reserve), Critical Biodiversity Area (CBA), coastal dune environment, endangered ecosystem and Key Biodiversity Area. The in-land portion has been regarded as more sensitive and would need to be avoided. Mitigations being considered for this site includes micro-siting, corridor retention and offsets. According to the Eastern Cape Biodiversity Conservation Plan (2019), the land within the AOI for Thyspunt is a CBA coastal dune environment, and Ecological Support Areas (ESA) and Key Biodiversity Area. There is a need to maintain complex function of mobile dune processes, which are interconnected. Sensitivity cannot be avoided nor impacts appropriately mitigated. Residual impacts of high significance remain after mitigation. However, it is important to note that the site has very likely been conserved to date because it has been identified as a future NPP site as per the Kouga SDF, without which the site would have likely already been developed for other purposes such as a residential area/expansion of Cape St Francis and Oyster Bay. The proposed NPP footprint will be limited, with the rest of the site still conserved as a CBA. However, both sites can contribute to stable electricity supply, with the Thyspunt area being earmarked for development within the LSDF and MSDF. Furthermore, the Thyspunt site is located in an area identified to be optimal for energy production and grid interconnection, as discussed in Chapter 2 and Chapter 6. In terms of layout optimisation, sensitive environments are being avoided as far as possible, as preliminary discussed in Chapter 6. In addition, preliminary mitigation measures have been recommended by the specialists in the scoping studies and detailed measures will be outlined in the EIA studies. These will be included in the impact assessment section of the Draft EIAR and in the Environmental Management Programme (EMPr).
Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No, the approval of this application would not compromise the integrity of the existing approved and credible IDPs and SDFs as agreed to by the relevant authorities as electricity is a key challenge faced within both municipalities.
Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g., as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	The Thyspunt site is characterised by a largely undisturbed coastal environment, particularly within the eastern embayment, which retains natural habitat conditions. There is also limited human activity on the site and along the shoreline. The nearshore habitat consists predominantly of dynamic sandy beaches, classified as Agulhas Intermediate Sandy Shore, which are considered of Least Concern nationally, with small patches of Agulhas Stromatolite Mixed Shore, a Vulnerable habitat type with a restricted national extent of just 8.45 km ² . While these areas are not designated Critical Habitat under IFC criteria, the eastern CBA Natural zone represents sensitive habitat where activities such as seawater abstraction or disposal are restricted and require careful, site-specific assessment. Overall, the site supports natural processes and habitats that are largely intact, and development should be focused on avoiding direct disturbance to these sensitive areas, prioritising

Question	Response
	construction within less sensitive sandy shore zones. Monitoring data from comparable scale development, such as the Koeberg NPP, indicates that these habitats are resilient to well-managed human activities, provided strict mitigation measures are applied.¹⁰² According to the Eastern Cape Biodiversity Conservation Plan (2019), the land within the AOI for Thyspunt is a CBA coastal dune environment, and ESA and Key Biodiversity Area. There is a need to maintain complex function of mobile dune processes, which are interconnected. Sensitivity cannot be avoided nor impacts appropriately mitigated. Residual impacts of high significance remain after mitigation.¹⁰³ Bantamsklip presents a site with clear evidence of ongoing human pressures along the coastal zone. Vehicular tracks were widespread across beaches and foredunes, indicating frequent access by recreational fishers, poachers, and kelp harvesters, which has led to localised erosion and degradation of dune vegetation. Illegal harvesting of invertebrates was prominent, with piles of discarded abalone shells, crayfish tails, and turbo shells observed, confirming active exploitation in the area. Kelp harvesting, particularly of <i>Ecklonia maxima</i>, was evident along the northern beach, with piles of drift kelp left to dry on the fynbos fringe, smothering underlying vegetation and potentially disrupting the local invertebrate communities dependent on this material. Offshore habitats include Vulnerable kelp forests, while to the south, Agulhas Reflective Sandy Shore habitats are classified as Endangered; these habitats are sensitive to direct disturbance, though they were not physically assessed during the site visit. Despite these pressures, the site is not considered Critical Habitat, and the natural processes are largely functional, albeit modified. Mitigation measures and management controls will be essential to limit further habitat degradation and guide development to the least sensitive areas, avoiding the most impacted dunes, nearshore kelp zones, and any patches of sensitive offshore habitats¹⁰². According to the Western Cape Biodiversity Spatial Plan (2023), the land within the AOI for Bantamsklip is within a protected area (nature reserve), CBA, coastal dune environment, endangered ecosystem and Key Biodiversity Area. The in-land portion has been regarded as more sensitive and would need to be avoided. Mitigations being considered for this site includes micro-siting, corridor retention and offsets.¹⁰³ The environmental sensitivities outlined in the Eastern Cape Biodiversity Conservation Plan (2019) and the Western Cape Biodiversity Spatial Plan (2023) as well as other sensitivities identified by the relevant specialists have been taken into consideration. This process has been outlined in Chapter 8. Further to this, in terms of layout optimisation, sensitive environments are being avoided as far as possible, as preliminary discussed in Chapter 6. In addition, preliminary mitigation measures have been recommended by the specialists in the scoping studies and detailed measures will be outlined in the EIA studies. These will be included in the impact assessment section of the Draft EIAR and in the EMP.

¹⁰² Anchor Environmental. (2026). Thyspunt and Bantamsklip Nuclear Project Environmental and Social Impact Assessment: Marine Ecology Scoping Report.

¹⁰³ The Biodiversity Company. (2026). Terrestrial Biodiversity Theme.

Question	Response
Do location factors favour this land use at this place? (this relates to the contextualisation of the proposed land use on this site within its broader context).	The locations were identified based on the following factors, in accordance with the NSIP report compiled in the 1980s and the previous Nuclear-1 EIA: Identified potential sites based on: ■ Electricity constraints; ■ Geotechnical and seismic stability; ■ Grid connection availability and feasibility; ■ Accessibility; ■ Environmental sensitivity; ■ Social sensitivity; and ■ Land ownership. The SA energy supply market remains dominated by coal, but the energy crisis coupled with the country's JET plans, alternative energy sources have become valuable potential sources for energy supply. Potential power station decommissioning in the near to medium-term. The identification of future nuclear facilities and the detailed assessments and monitoring required to confirm suitability takes place over extended periods and are costly. Hence, it is prudent to utilise sites which have been thoroughly assessed.
How will the activity of the land use associated with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	The proposed development is subject to a S&EIA Process in terms of the NEMA (as amended) and Appendix 2 and 3 of the EIA Regulations, 2014 promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017. The competent authority for this S&EIA Process is the national DFFE. The impact on sensitive and cultural areas is detailed in Section 8 and Section 9 of this report. Mitigation measures will be recommended by the specialists where necessary. Provisional mitigation measures have been identified and outlined in Section 9 of the FSR. These measures will be further interrogated during the EIA phase of the project and included in an EMP.
How will the development impact on people's health and well-being? (E.g. In terms of noise, odours, visual character and sense of place, etc.)?	During both the construction and operational phases, for the Thyspunt site, younger children <15 years of age and older (65+) adults are more sensitive to the effects of air pollution by default: < 15 years: low degree of vulnerability to the cardiovascular and respiratory effects of PM_{2.5}. 65+ age group: moderately increased vulnerability to respiratory effects, but not vulnerable to cardiovascular effects.¹⁰⁴ During both the construction and operational phases, for the Bantamsklip site, younger children <15 years of age and older (65+) adults are more sensitive to the effects of air pollution by default: < 15 years: low degree of vulnerability to the cardiovascular effects, but respiratory vulnerability not indicated.

¹⁰⁴ Infotox (Pty) Ltd. (2026). Scoping and Baseline Health Assessment Report for the Rapid Appraisal Health Impact Assessment of PM_{2.5} from the Proposed Construction and Operation of the Eskom Nuclear Power Plant at Thyspunt.

Question	Response
	65+ age group: cardiovascular or respiratory vulnerability not indicated.¹⁰⁵ It must however be noted that the impact from dust is more likely to occur during the construction phase of the NPP, with limited dust expected during the operational phase. In terms of Radiological Impacts, both Bantamsklip and Thyspunt have Low significance ratings from normal NPP operational discharges.¹⁰⁶ In terms of visual sensitivities, both sites have similar pristine landscapes and high aesthetic appeal, are located along sections of unspoilt coastline, have a HIGH negative visual impact significance during operation and have limited mitigation in reducing visual impact.¹⁰⁷ Regarding noise, the noise generating potential of the project is high during construction. Thyspunt has numerous nearby receptors, most of which is Eskom owned land. Bantamsklip has a limited number of nearby receptors.¹⁰⁸ Potential impacts have been identified at the scoping phase by the specialists. Preliminary mitigation measures have been recommended by the specialists in the scoping studies and detailed measures will be outlined in the EIA studies. These will be included in the impact assessment section of the Draft EIAR and in the EMP. The preliminary findings of this S&EIR process and associated specialist studies conclude that there are no fatal flaws associated with the proposed NPP. Negative environmental impacts associated with the proposed NPP can preliminary be mitigated to acceptable levels. This will be investigated in detail in the EIA phase, where the EAP can then provide an EAP opinion.
Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs	No. The costs will be higher for Bantamsklip as the readiness status is still further away in comparison to the Thyspunt site readiness. However, these have been included as part of Eskom's long-term generation budget.
Will the proposed land use result in unacceptable cumulative impacts?	At this stage, no unacceptable cumulative impacts have been identified. The cumulative impacts are outlined in Section 9 and will be assessed in more detail in the EIA phase.

¹⁰⁵ Infotox (Pty) Ltd. (2026). Scoping and Baseline Health Assessment Report for the Rapid Appraisal Health Impact Assessment of PM2.5 from the Proposed Construction and Operation of the Eskom Nuclear Power Plant at Bantamsklip.

¹⁰⁶ PSI Risk Consultants. (2026). Environmental Impact Assessment for the Proposed Nuclear Power Plant and Associated Infrastructure Assessment of the Potential Radiological Impact on the Public and the Environment.

¹⁰⁷ Bapela Cave Klapwijk Land Planning and Design. (2026). Proposed Nuclear Power Plant Visual Impact Report Scoping Phase Bantamsklip and Thyspunt.

¹⁰⁸ WSP Africa. (2026). Environmental and Social Impact Assessment for the Proposed Nuclear Power Plant, Environmental Acoustic Scoping Report.

6 PROJECT ALTERNATIVES

6.1 REGULATIONS ON PROJECT ALTERNATIVES^{109,110}

According to the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014, as amended, alternatives is interpreted as follows:

“‘alternatives’, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the-

- a) property on which or location where the activity is proposed to be undertaken;*
- b) type of activity to be undertaken;*
- c) design or layout of the activity;*
- d) technology to be used in the activity; or*
- e) operational aspects of the activity;*

and includes the option of not implementing the activity”

It is important to note that a range of alternative types may be considered within the EIA process. The examples provided above are illustrative of the categories of alternatives that may be explored. In accordance with the EIA Regulations under NEMA, the requirement is to identify and assess reasonable and feasible alternatives; however, this does not prescribe that all types of alternatives must be included in every assessment.

As such, the consideration of alternatives is context-specific and guided by the nature of the proposed activity, its objectives, and screening outcomes. There is no legislative requirement that specific alternatives—such as alternative sites or technologies—must be assessed in all cases, provided that the approach to alternative identification and selection is adequately motivated and consistent with the principles of reasonableness and feasibility.

The “feasibility” and “rationale” of and the need for alternatives must be determined by considering, inter alia,

- the general purpose and requirements of the activity;
- need and desirability;
- opportunity costs;
- the need to avoid negative impact altogether;
- the need to minimise unavoidable negative impacts;
- the need to maximise benefits; and
- the need for equitable distributional consequences.

¹⁰⁹ Department of Environmental Affairs and Tourism. (2006). Guideline 5: Assessment of Alternatives and Impacts.

¹¹⁰ Environmental Affairs. (2014 as amended). NEMA EIA Regulations.

Alternatives are critical in the EIA process because they allow for the exploration of different ways to meet the purpose and need of a proposed project, ultimately aiming to avoid or minimise negative environmental impacts.

The identification, description, evaluation and comparison of alternatives are important for ensuring the objectivity of the assessment process. In cases where there is no objective and thorough assessment of alternatives, the EIA process usually only confirms a chosen activity and the value of the assessments as an input to decision-making may be compromised.

This process, which includes the 'no-go' alternative, enables informed decision-making by providing the competent authority with objective information about the social, biophysical, economic and technical factors of all feasible and reasonable alternatives.

Every EIA process must therefore identify and investigate alternatives, with feasible and reasonable alternatives to be comparatively assessed. However, if after having identified and investigated alternatives, no feasible and reasonable alternatives are found, no comparative assessment of alternatives, beyond the comparative assessment of the preferred alternative and the option of not proceeding, is required during the EIA phase.

At the scoping level the evaluation of alternatives is provided at a high level in the absence of detailed environmental comparators for each alternative; due to the two-staged nature of the S&EIR process it is more suitable to identify and describe the potential alternatives on a high-level basis within scoping, and to perform a more detailed analysis of alternatives (with environmental comparators) in the EIA phase of the project. As such, the S&EIR will holistically assess the impacts and risks of each alternative comparatively, as suggested by Appendix 2 of the EIA Regulations of 2014 (as amended). Alternatives will be described and assessed in more detail during the EIA Phase as updated information is made available such as specialist baselines studies and specialist impact assessments.

Extensive consideration of alternatives and avoidance of impacts took place in the screening/design phase. This is discussed in detail in the section below.

6.2 IMPORTANCE OF ALTERNATIVES

- **Impact minimisation and avoidance:** The primary goal of considering alternatives is to identify options that result in the least possible harm to the environment, socio-economic conditions, and cultural heritage.
- **Informed decision-making:** Alternatives provide the competent authority with the necessary data to make informed decisions, ensuring that all potential consequences of a development proposal are adequately considered before action is taken.
- **Promotes sustainable development:** The consideration of alternatives aligns with NEMA's environmental principles, such as sustainable development, by ensuring that development is balanced with environmental protection.
- **Identifies different approaches:** Alternatives can be fundamentally different from the proposed project (e.g., a different type of activity) or incrementally different (e.g., a different location or technology).
- **Includes the no-go option:** A crucial alternative to assess is the no-go option, which evaluates the environmental consequences of not proceeding with the proposed activity at all.

- **Encourages Public Participation:** The assessment of alternatives ensures that issues raised by I&APs are addressed, fostering transparent and inclusive decision-making processes.

6.3 TYPES OF ALTERNATIVES

Alternatives to be considered includes the following, but are not limited to:

- **Activity:** Different project types.
- **Location:** Different sites for the proposed activity.
- **Scheduling:** Different timings for the project's implementation.
- **Technology:** Different processes or methods to be used.
- **Layout:** Different layouts or designs of the activity.
- **Inputs:** Different resources or raw materials.
- **Demand:** Alternatives that meet the demand without a traditional large-scale project.
- **No-go:** Not undertaking the proposed activity or any of its alternatives.

6.4 ALTERNATIVES CONSIDERED FOR THE NUCLEAR POWER PLANT

The key alternatives being considered for the proposed NPP project are based on information that is currently available from the Nuclear 1 EIA process, the scoping phase specialist studies and associated extensive discussions with specialists and Eskom, and the NSIP process. These alternatives are outlined in the sections below.

6.4.1 SITING ALTERNATIVES¹¹¹

6.4.1.1 Nuclear Site Investigation Programme¹¹³

The consideration of alternative locations for the proposed NPP was derived from the findings of the Nuclear Site Investigation Programme (NSIP) study undertaken by independent consultants during the 1980s and the findings of the EIA process undertaken for Nuclear-1.

This NSIP (1980s) remains the only national-scale, systematic nuclear siting exercise conducted in South Africa. It was explicitly designed to identify coastal locations suitable for nuclear power generation through the application of internationally recognised nuclear siting principles. The NSIP included a large number of specialists, including a range of scientific, engineering, and social science fields, including geologists, ecologists, engineers, town planners and sociologists. The NSIP was undertaken along the West Coast, Southern Cape and Eastern Cape Coasts and comprised of three phases. Phase 1 and 2 involved desktop studies of suitable areas along the coast only. After suitable regions were identified, sites within those regions were earmarked for more detailed investigations. Those sites that were identified were then further considered in Phase 3 through field investigations. These field investigations were undertaken in order to determine the suitability and sensitivity of the

¹¹¹ Eskom. (2008). Eskom Nuclear Power Station and Associated Infrastructure, Final Scoping Report.

regions identified, and subsequently the sites identified. As part of the NSIP, the studies undertaken are noted in Table 6-1.

Table 6-1 – Studies Undertaken for NSIP

Study Theme	Studies
Regional Suitability Study	- Geology - Seismicity - Geohydrology
Regional Sensitivity Study	- Preliminary Impact Assessment - Socio-psychological and Socio-economic Baseline Study
Site Specific Suitability Studies	- Physiography - Geology - Geohydrology - Seismology - Meteorology - Corrosion - Demography - Water Supply - Power Transmission - Coastal Engineering - Access Routes - Heavy Load Route Investigation - Transport of Nuclear Waste - Terrain Cost Comparison - Sources of Construction Materials - Terrestrial Environment - Intertidal and Offshore Marine Environment - Social Environment - Communication Programme - Property Acquisition

The relevance of the NSIP does not rest on its age, but on its scope, methodology, and the nature of the constraints it assessed. Nuclear siting is governed primarily by long-term physical and safety-critical parameters, such as regional geology, seismic stability, coastal processes and large-scale meteorology, which do not materially change over time.

Crucially, the NSIP has not been relied upon in isolation. Its outcomes have been progressively tested, refined, and confirmed through subsequent site-specific investigations, Site Safety Reports (SSRs), and formal EIA processes, including the Nuclear-1 EIA and the current NPP S&EIR process. These later studies have not contradicted the NSIP; they have narrowed and strengthened its conclusions.

This site selection process followed the IAEA guidelines and resulted in five candidate sites after extensive evaluation. Nuclear-1¹¹² EIA process also reaffirmed findings from the NSIP. The identification of the sites has allowed Eskom to secure the properties and to carry out detailed studies to confirm the suitability of the sites.

¹¹² GIBB (Pty) Ltd. (2016). Final Environmental Impact Assessment Report for the Eskom Nuclear Power Station and Associated Infrastructure (Nuclear-1). DEA Reference No.: 12/12/20/944.

The five specific sites within the identified regions that were earmarked for further detailed investigations are as follows, as depicted in Figure 6-1:

- Brazil (Northern Cape)
- Schulpfontein (Northern Cape)
- Duynefontyn (Western Cape)
- Bantamsklip (Western Cape)
- Thyspunt (Eastern Cape)

In 2025, the Duynefontyn site in the Western Cape was authorised by DFFE for the establishment of a NPP (Nuclear 1) as it is located adjacent to the existing Koeberg NPS. As a result, this EA process involves the investigation of the remaining four sites, namely: Brazil (Northern Cape), Schulpfontein (Northern Cape), Bantamsklip (Western Cape) and Thyspunt (Eastern Cape).

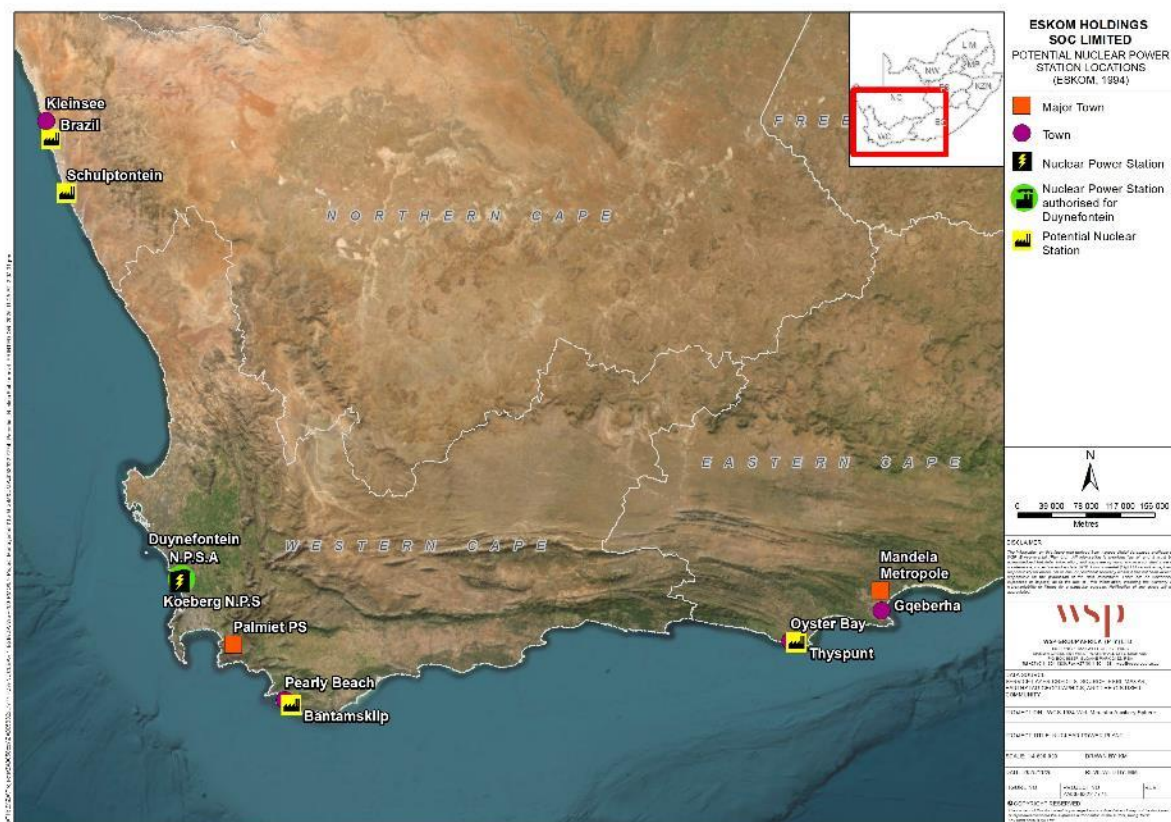


Figure 6-1 – NSIP Earmarked Sites

6.4.1.2 Brazil and Schulpfontein^{112,113}

The Brazil site is situated in the Northern Cape, within the jurisdiction of the Nama-Khoi Municipality, West Coast Division. It is approximately 5 850.43 ha in extent. Schulpfontein is situated south of Brazil, in the Northern Cape. It also falls within the jurisdiction of the Nama-

¹¹³ ARCUS GIBB (Pty) Ltd. (2008). Eskom Nuclear Power Station and Associated Infrastructure, Final Scoping Report. DEAT Reference Number: 12/12/20/944.

Khoi Municipality, West Coast Division and is approximately 8 941.52 ha in extent. Reference is made to Figure 6-1.

Brazil and Schulpfontein were identified by the NSIP as potential sites warranting further investigation. They were not identified as preferred or equivalent to all other sites in perpetuity. Site identification under the NSIP was explicitly intended to be followed by staged refinement, with sites progressing or falling away based on subsequent investigation, feasibility, and regulatory readiness.

Since the NSIP, Brazil and Schulpfontein have not advanced through sustained, detailed, or site-specific investigations. In contrast, Thyspunt and Bantamsklip have been subject to progressively more detailed studies, including environmental baseline surveys, specialist assessments, coastal studies, SSRs, a NISL application (Thyspunt) and formal EIA processes. This has resulted in a material difference in the level of confidence, data availability, and regulatory maturity between these sites.

The Brazil and Schulpfontein sites are deemed less suitable for the current NPP and are therefore excluded from further assessment, for the following reasons:

- In terms of the baseline environments, Brazil and Schulpfontein were the least studied sites, with insufficient information available for both sites on the following aspects, leaving substantial data gaps relative to the requirements of a NISL application¹¹³:
 - Geology
 - Seismology
 - Vertebrates
 - Hydrology
 - Fresh Water Supply
 - Oceanographic
 - Air Quality
 - Social
 - Human Health
 - Agriculture
 - Noise
 - Transport and Accessibility
 - Cumulative Impacts
- Some baseline environmental information is available for the sites summarised in Table 6-2 below¹¹³:

Table 6-2 – Available Baseline Information¹¹³

Aspect	Brazil	Schulpfontein
Climate	Characterised by suppressed vertical motion and offshore transport for most of the year.	
Geohydrology	Regionally, aquifers are classified as poor. Aquifers are considered to be potentially least vulnerable.	
Geotechnical	Overburden (two to six metres thick) should not induce geotechnical problems and the sites contain excellent founding conditions.	
Flora	Well represented, under conserved, with relatively low habitat quality.	Well represented and under conserved.

Aspect	Brazil	Schulpfontein
Invertebrates	Valuable, near pristine representations of arid adapted species associated with the Cape Floristic Region.	
Fresh Water Ecology	No wetlands identified.	
Marine Biology	Sites are remote, contain less biodiversity and have few localised endemic species when compared with rocky shores located on the south coast.	
Economic	Sites are potentially associated with significant direct costs and development constraints	
Visual	Medium visibility as a result of low landforms partially obscuring the site from the coast road, but the visual intrusion on the site character is high. Communities do not really feature, because there are none that will be directly visually exposed to views of the NPS. This, however, may change in the long-term.	Highly sensitive to visual change because of its high visibility, the total change to the ambience of the site and the view onto the site is totally unobstructed.
Heritage and Cultural Resources	Archaeological sites are shallow and occupy single horizons, which are easy to mitigate.	
Tourism	Normal operation of a NPP could promote tourism locally, with economic benefits accruing at the local level. A substantial nuclear incident is unlikely to permanently diminish the Namaqualand tourism asset as a whole assuming that no major tourism developments are in the planning process at present.	
Power Infrastructure	Limited local power demand, consisting of Oranjemund, Gromis and Aggeneis. No existing power infrastructure and corridors to export the power, as depicted in Figure 6-2. The dashed lines represent the new power corridors that will have to be established in the event that the proposed NPP is located at either Brazil or Schulpfontein. Figure 6-2 – Power Corridors¹¹³ The local load, taking into account the exportation to NamPower (a Namibian Power company that South Africa exports power to), is not considered significant. In order to safely integrate the power generated, the power corridor will have to consist of a minimum of three powerlines for the initial units. The number of circuits required will increase as the number of units increase. Corridor A will link the sites directly to the Central or North-West Grids in order to supply the power to the areas in demand. The transmission of the power from Brazil and/or Schulpfontein will entail the construction of a power corridor ranging between 1 400 and 1 600 km in length, which constitutes a significant investment and additional potential for significant environmental impacts. Corridor B will provide a secure off site supply and system stability mechanism. The construction of two 400 kV lines of 400 km linking to Aurora is believed to be adequate to perform this function. As a result of this, there will be:	

Aspect	Brazil	Schulpfontein
	▪ Lengthy time delays associated with the authorisation and construction of the new power corridors applicable to the Northern Cape sites, which will prevent Eskom from providing power within the required timeframes; ▪ Significant environmental impacts associated with the construction of new power corridors given that there is existing infrastructure at or near the other two potential sites; and ▪ Cost implications associated with the development of new power corridors at the present time.	

- As a result of the above, reaching the stage at which a NISL application could be submitted to the NNR is expected to take many years. In this regard, Brazil and Schulpfontein are materially less advanced than Thyspunt and Bantamsklip in terms of NISL readiness.
- The lengthy time delays will prevent Eskom from providing the power within the IRP 2025 required timeframes (by 2039).

In summary, the Brazil and Schulpfontein sites are not considered viable options for the proposed NPP at this stage, primarily due to limitations regarding infrastructure, strategic suitability, and cost-effectiveness. This conclusion is also reflected in the then DEAT formal response to the Nuclear-1 Scoping Report and Plan of Study for EIA on 20 November 2008. The DFFE accepted the exclusion of the Brazil and Schulpfontein sites for the purposes of the Nuclear-1 EIA. The approach of basing the alternative sites on those identified in the NSIP was also accepted by the DFFE. The DFFE also acknowledged that these sites may, however, be subject to future investigations for future nuclear power generation developments.

It must be noted that despite the exclusion of Brazil and Schulpfontein from this EA process, this does not preclude these sites from possible future NPP projects by Eskom.

Furthermore, the EIA Regulations require the assessment of reasonable and feasible alternatives. Reliance on the NSIP and subsequent investigations does not constitute pre-determination. It reflects the technical and regulatory reality that nuclear site selection is a staged, cumulative process spanning decades. The current EIA remains outcome-neutral and subject to full regulatory review, public participation, and authority decision-making. Undertaking a new national-scale coastal site search would amount to duplicating the NSIP, despite the fact that the physical and safety constraints underpinning nuclear siting have not materially changed and several NSIP-derived sites remain technically viable and well characterised. The EIA process is not intended to re-open settled strategic-level screening exercises where these remain valid, but rather to refine and test viable options at project level.

Thus, the two site alternatives taken forward for further assessment in this application are Bantamsklip and Thyspunt.

6.4.1.3 Managing Siting Activities¹¹⁴

It is important to recognise that the purpose of the siting activities goes beyond choosing a suitable site and acquiring a licence. Issues may arise during operations that require further justification. A large part of the siting project is about producing and maintaining a validated, referenced bank of data that can be used during the lifetime of the NPP. The IAEA (NG-T-3.7) also highlights the importance to data collection is that the 'siting project' for one site may occur in several stages, with significant time lapses between them. According to the IAEA, "a site might be considered suitable but not chosen for the next nuclear power plant". Subsequently, many years later it might become the selected site for a NPP. It is essential that the data collected originally are still available, both to avoid the cost of reproducing data and to provide information on how some data change with time (IAEA NG-T-3.7). Countries expanding their nuclear power programme face different considerations and issues to those introducing their first NPP. In these countries, regulatory bodies are already established and the operating organisations looking to operate the new NPP has been identified. Some of the main issues to be considered are as follows:

- Evaluating the use of existing sites for additional NP units; and
- Re-evaluation of sites selected several years ago with new regulations.

It is also important to note that the siting process itself can take between 6 to 10 years, based on NG-T-3.7, site survey can take up to 12 months, site selection and assessment stage (up to 36 months) and pre-operational stage (site evaluation), which could take up to 7 years.

Based on the above, it is important to note that NPP development processes throughout the world require extensive leg work before construction can even commence, hence taking up to several years prior to commencement. To indicate this, Figure 6-3 highlights the roadmap and status of the first nuclear power project, El da Baba (Egypt), which was selected in 1980 for NPP development, but construction only commenced in 2022¹¹⁵.

¹¹⁴ Page 3 of IAEA Managing Siting Activities (NG-T-3.7).

¹¹⁵ Eskom. (2026).

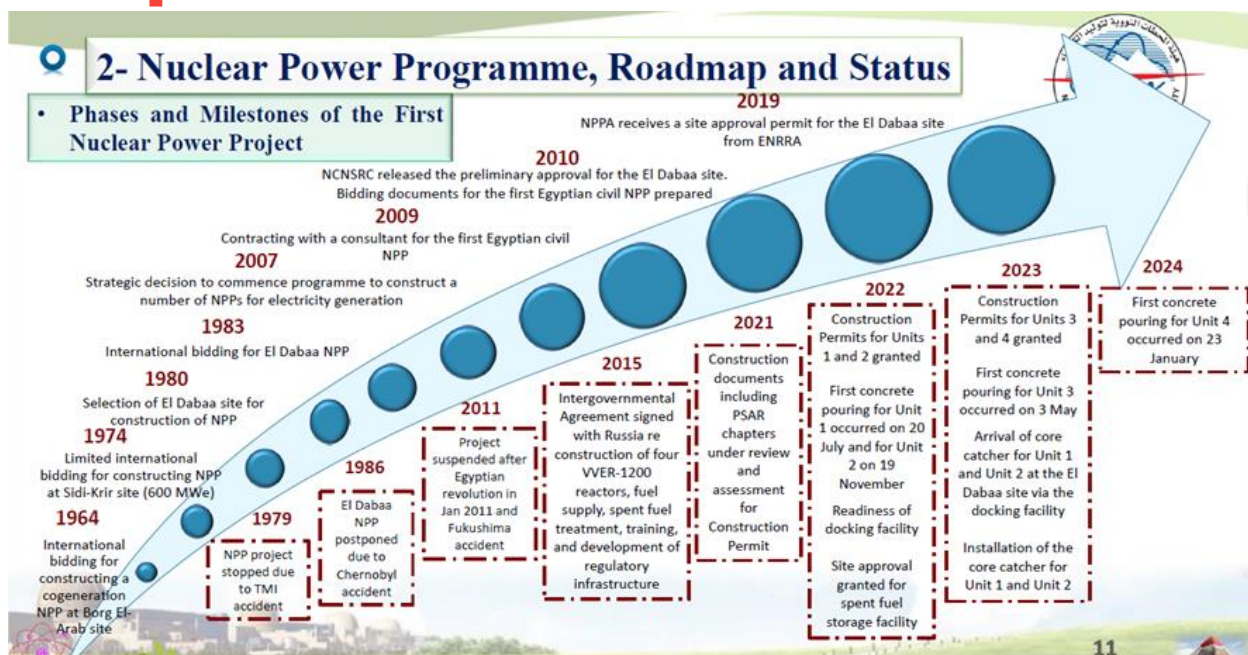


Figure 6-3 – El da Baba NPP Roadmap and Status¹¹⁵

Another indication is the Rappoor NPP as selected in 1962, but only received the site license in 2016, with the history of the project depicted in Figure 6-4¹¹⁵.



Technical Meeting on Topical Issues in the Development of Nuclear Power Infrastructure, Vienna, Austria, from 14 to 17 March 2023



Nuclear History in Bangladesh

- ❖ First plan to establish a nuclear power plant at Ishwardi, Pabna was taken in 1961.
- ❖ 292 acres land were obtained in 1962-68 at Ishwardi, Pabna.
- ❖ 1969-70: the project was shifted to Pakistan by the Pakistan Government.
- ❖ 1972-1996: Several feasibility studies and other activities were conducted to build a plant at that site.
- ❖ 2010: Setting up Rooppur NPP granted in the parliament
- ❖ 2010: Formation of National Committee under PM, Technical Committee under MoST, Formation of NEPIO
- ❖ 2011-2016: Bangladesh & Russia signed different contracts to build a NPP in Bangladesh territory.
- ❖ 2016: Obtained site license for Rooppur NPP from BAERA.
- ❖ 2017: November, Construction License Awarded for 1st Unit
- ❖ 2017: November, DOE approved the EIA of Rooppur NPP
- ❖ 2017: November, FCD for Unit 1
- ❖ 2018: July, Construction License Awarded for 2nd Unit, FCD for Unit 2

Figure 6-4 – Rappoor NPP History¹¹⁵

Additional examples include the NPP in Morocco with a siting process undertaken between 1984 and 1994, however, to date, no construction has commenced; and Turkiye: Akkuyu was selected in 1976, the site report was updated in 2013 and the site license only received in 2017.

6.4.1.4 Coega as an Alternative Site¹¹²

In terms of assessing other sites from what the NSIP identified, during the EIA process of Nuclear-1 (Scoping and EIA commenting periods), I&APs questioned why the Coega Industrial Development Zone (IDZ) has not been considered as an alternative site, as it would seem to be an ideal site for a nuclear power station, owing to the fact that the Coega IDZ is attempting to attract large, electricity-intensive industries. It is, furthermore, an already developed ('brownfields') site; therefore, not subject to the same environmental impacts as undeveloped ('greenfield') sites such as Bantamsklip and Thyspunt.

The background to the investigation of the Coega IDZ and reasons why the IDZ cannot be currently considered as a reasonable and feasible alternative remains the same for Nuclear-1 and the current proposed NPP and are identified in Table 6-3.

Table 6-3 – Reasons for excluding Coega IDZ¹¹²

Aspect	Reason
Technical	The Alexandria area was omitted from consideration after investigations revealed the following: ■ A power station would have to be founded on at least 20 to 30 m of unconsolidated sand. Piled foundations would have to be used but these are unacceptable as their seismic design requirements are particularly onerous; ■ According to the Council for Geoscience, which was responsible for the seismic studies for the sites under consideration for Nuclear-1, the presence of the Coega fault, which runs across the southern part of the Algoa basin before extending into Algoa Bay near the Coega harbour, means that the Coega IDZ should be considered carefully before proceeding with geological investigations for nuclear siting; ■ The confirmation of seismic suitability requires the installation of a network of micro-seismic monitors across the site, and the collection of monitoring data over a period of at least five years. No such monitoring has been performed to date and if it were started now, it would delay the development of the current proposed NPP by at least five years; and ■ The proposed EPZ's 800 m and 3 km around Nuclear-1 and/or the current proposed NPP would respectively sterilise large portions of the Coega IDZ and place development restrictions on other industrial development in the IDZ, thereby limiting the IDZ's value for industrial development.
Ecological	■ The region consists of sandy beaches with large wind-driven mobile dunes behind the shoreline. These dune systems comprise the largest mobile dune field in South Africa (larger even than those of the Oyster Bay mobile dune field at Thyspunt). The only rocky outcrops are the cliff faces at Cape Padrone and Woody Cape. The shoreline is easily eroded and unsuitable for the siting of a NPP. In addition, the engineering problems associated with the natural movement of the dunes would be considerable; ■ The environmental consultants (the University of Cape Town's Environmental Evaluation Unit) considered the environmental sensitivity of this portion of coastline to be very high. The Alexandria Forest is a unique natural forest occurring only along this stretch of the Eastern Cape coastline and any disturbance to these forests would be highly undesirable; and ■ The ecology of the dune fields is also considered to be highly sensitive.

6.4.1.5 Current EIA Process

Under the NEMA EIA Regulations, 2014 (GN R982, as amended), the NEMA EIA framework defines “alternatives” broadly as different means of meeting the purpose of the activity, which may include a different property/location, but also includes type of activity, design/layout, technology, operational aspects, and the “no go” option. In other words, compliance is achieved by assessing reasonable and feasible alternatives, and those alternatives do not have to be multiple sites if only one location is practically available or feasible for the proposed activity.

The inclusion of both Thyspunt and Bantamsklip in Scoping was driven by the pre engagement with DFFE (**Appendix J**), where DFFE representatives explicitly raised the requirement to include an alternative location, and this is why Bantamsklip was included as a site alternative.

For the Thyspunt and the Bantamsklip sites, Eskom has conducted a comprehensive assessment of past studies and updated all related data and information to align with improvements in the state of international practice for data collection and analysis, and new regulatory requirements and guidelines.

These studies included seismic monitoring supplemented by airborne and marine geophysical surveys to further rule out any potential disqualifiers/fatal flaws. Once it was established that no disqualifiers existed on these sites, Eskom conducted detailed site evaluation studies to demonstrate the suitability of the sites.

Site Alternative 1: Thyspunt

Thyspunt is situated in the Eastern Cape on the coast between the towns of Oyster Bay in the west and St. Francis Bay in the east. The site for the proposed NPP is currently vacant. There are a number of houses on the adjacent properties, but these are far outside the proposed Protective Action Zone (PAZ) of 800 m from the proposed NPP. To the north of the sand dunes, which span the northern portion of the site, the dominant land use is dairy farming.

Site Alternative 2: Bantamsklip

Bantamsklip is situated along the Southern Cape coast and is located approximately mid-way between Danger Point and Quoin Point. The site for the proposed NPP forms a part of the total Bantamsklip property. The proposed site is vacant and utilised for activities such as flower harvesting, as well as fishing and illegal harvesting of abalone. Only the Farm Groot Hagelkraal 318 is declared as a private nature reserve (Groot Hagelkraal Private Nature Reserve status), in terms of Section 12(4) of the Western Cape Nature and Conservation Ordinance, 1974 (Ordinance 19 of 1974), and not the entire site.

Table 6-4 below provides a comparison between the two sites, Thyspunt and Bantamsklip.

Table 6-4 – Preliminary Comparison between Alternative sites (AD = Advantage, DIS = Disadvantage, NR = Not Relevant)^{116, 117, 118, 119, 120}

ASPECT	THYSPUNT	AD	DIS	NR	BANTAMSKLIP	AD	DIS	NR	PREFERRED
Coordinates	34°10'60"S; 24°43'00"E			X	34°42'33.95"S; 19°34'07.29"E			X	Neutral
Buildable Footprint	250 ha in extent	X			170 ha in extent		X		Thyspunt
Locality	Situated approximately 7 km of Oyster Bay and 11 km of St. Francis within the jurisdiction of the Sarah Baartman District Municipality, Eastern Cape Province.			X	Situated on the Southern Cape coast, mid-way between Danger and Quoin Points approximately 7 km SE of Pearly Beach in the Overberg District of the Western Cape Province.			X	Neutral
Properties	Farm 744 Portion 0 Farm 745, Goed Geloof, Portion 238 Farm Langefontein 736 Portion 2; 3, 4 and 5 Farm Welgelegen 735 Portion 2, 14 and 16 Farm Welgelee 743 Portion 4 Farm 741 Portion 0 Farm Buffelsbosch 742 Portion 16 and 17			X	Farm Hagelkraal 318 Portion 1 Farm Hagelkraal 318 Portion 0 Farm Buffel Jagt 309 Portion 3 Farm Buffel Jagt 311 Portion 0 Farm Luipaards Poort 310 Portion 0			X	Neutral
Land Ownership	Eskom owns the properties apart from one needed for site access.		X		Eskom only owns a fraction of the properties needed.		X		Neutral
Land Use ¹²¹	Greenfield site No current development beyond a few houses and an Eskom office/workshop.		X		Greenfield site No development on site apart from a few houses and a shed.		X		Neutral
Site Readiness	Significant specialist work has been undertaken on site, both for the Nuclear 1 EIA as well as for the NISL application. Eskom submitted a NISL application to the NNR for the Thyspunt site in 2016 and an updated NISL application in 2026, with the updated documents currently under review by the NNR. Public hearings are subject to the NNR board decision, whereby Eskom will be instructed to publish the reports for public review, potentially between September and November 2026.	X			Reaching the stage at which a NISL application could be submitted to the NNR is expected to take approximately 5 years. In this regard, Bantamsklip is materially less advanced than Thyspunt in terms of NISL readiness. While specialist studies were previously undertaken for the Bantamsklip site as part of the Nuclear-1 EIA, substantial data gaps remain relative to the requirements of a NISL application. The remaining scope of siting studies for Bantamsklip is expected to require a further two to three years of work (at a significant cost). This additional work includes, but is not limited to, the following: ■ Oceanography – new study required ■ Geology and Geotech – additional drilling required ■ Seismology (seismic hazard) – additional study required ■ Hydrology – study must be updated ■ Geohydrology – study must be updated ■ Meteorology – study must be updated ■ Nearby transportation, industrial and military facilities – must be updated ■ Impact on plant design – must be updated ■ Land Use – study must be updated ■ Population – must be updated ■ Sea use – must be updated		X		Thyspunt

¹¹⁶ Site Safety Report for Bantamsklip, October 2013, Eskom

¹¹⁷ Pre-Application Meeting Request, September 2025, WSP

¹¹⁸ Geohydrology Environmental Impact Report for the Proposed Nuclear Power Station ('Nuclear-1'), November 2014, SRK Consulting

¹¹⁹ Nuclear 1 Comparison between Thyspunt, Bantamsklip and Koeberg Sites, GP Report_08/61 Public Version, October 2008, Eskom

¹²⁰ Nuclear 1 Final Environmental Impact Assessment Report, February 2016

¹²¹ The yellow areas indicate the main farm property, not the footprint of the site

ASPECT	THYSPUNT	AD	DIS	NR	BANTAMSKLIP	AD	DIS	NR	PREFERRED
Transmission	Eastern Cape and KwaZulu-Natal (KZN) face a capacity deficit in electricity alternatives, making them strategic locations for infrastructure strengthening. Plans are in place for the connection of the Thyspunt site to the National Grid with 1 400 km of 765 / 400 kV lines. Connection is considered achievable before 2039 (60 months after EA and servitudes secured). Thyspunt is located nearer to established transmission nodes in the Eastern Cape, including Grassridge and Dedisa. Integration is expected to require longer 765 kV transmission development, supplemented by shorter 400 kV connections into existing infrastructure. This enables partial utilisation of established servitudes and reduces overall construction complexity, environmental impact, and implementation risk.	X			Integrating Bantamsklip into the Western Cape Corridor is challenging in that it will require 2211 km of 765 / 400 kV lines. This is unlikely to be achievable before 2039 due to the complex and sensitive terrain that exists in the surrounding areas. Bantamsklip presents a significantly higher level of transmission development complexity due to its limited proximity to existing high-voltage infrastructure. The nearest transmission substation is approximately 100–120 km away, requiring the establishment of new 400 kV and 765 kV corridors of up to 150–200 km each, as well as the development of multiple new substations and strengthening of the upstream Cape transmission backbone.		X		Thyspunt
Access routes for large components	Route between Gqeberha and Thyspunt is shorter and topographically less complex. This route therefore poses fewer technical difficulties to heavy load transportation vehicles and thus has a smaller associated safety risk (to other road users and transportation staff). There are no bridge obstructions or steep grades along this route.	X			Route between Cape Town Harbour and Bantamsklip is longer and topographically more complex, with the need to traverse Sir Lowry's pass being particularly challenging. This route therefore poses major technical difficulties to heavy load transportation vehicles and thus has a greater associated safety risk (to other road users and transportation staff). There are also significant bridge obstructions and steep grades along this route.		X		Thyspunt
Specialist Consensus	Following the scoping phase specialist input Thyspunt is favoured by 8 ¹²² specialists with 11 being neutral. Furthermore, no fatal flaws have been identified.	X			Following the scoping phase specialist input Bantamsklip is favoured by 6 specialists with 11 being neutral. Furthermore, no fatal flaws have been identified.		X		Thyspunt

¹²² Inconsistency between Table 6.4 and Table 11.3 corrected, as identified during public review. It must be noted the 2 specialiss did note that although Bantamsklip was preferred, Thyspunt would also be suitable, therefore accounting for an additional 2 specialists being in favour of Thyspunt.

6.4.2 TRANSMISSION INTEGRATION

The integration of transmission infrastructure has been considered in the scoping phase. However, detailed transmission line routing and corridor-level impacts will be authorised through a separate EIA process under the responsible transmission entity, i.e. the National Transmission Company of South Africa (NTCSA). Given the significant costs associated with initiating the assessment and providing quotations for the transmission integration and requiring a level of certainty prior to initiating this, it is recommended the Generation site is selected prior to significant work being initiated for Transmission infrastructure¹²³.

6.4.2.1 Local Integration

Local integration focuses on community-level sustainability and asset management within a specific area. Local integration is often about distributed energy resources, resilience, and community involvement. A substantial number of transformers, substations and lines are required for local generation integration and evacuation in the southern supply areas.

Transmission Integration at Thyspunt

The Thyspunt site will provide a completely new generation pool for the Eskom transmission system to supply both the Eastern Cape loads as well as export excess power to the rest of the network. Besides the advantages of diversity of generation, the Thyspunt site will link up to new transmission lines already under construction to Gqeberha, thus maximising the benefits of the new transmission infrastructure, as well as provide a voltage controllable busbar in the Eastern Cape, which is of significant value to the operation of this network and the transmission system as a whole.

The integration of the NPP at Thyspunt is based on constructing up to five 400 kV lines from the site towards Gqeberha and connecting to the 765 kV network at the Grassridge substation. The 400 kV lines will also integrate with the Dedisa substation and the new Gqeberha 400 kV substation to be established to supply the growing loads in this area. These 400 kV transmission lines form part of the development of the transmission networks to improve the security of supply in the Great Gqeberha area and in particular the Coega IDZ. The two 765 kV lines (total of 1 400 km in length) between Gamma and Grassridge substation will be required to be constructed by the time Thyspunt is commissioned to evacuate the excess power. This is depicted in Figure 4-9.

Thyspunt is less than 100 km from the existing main substations and around 1 400 km of 765 / 400 kV lines will be required. Integrating the NPP with the current transmission integration plan at Thyspunt is plausible.

¹²³ Additional clarity provided as a result of DFFE and Stakeholder comments.

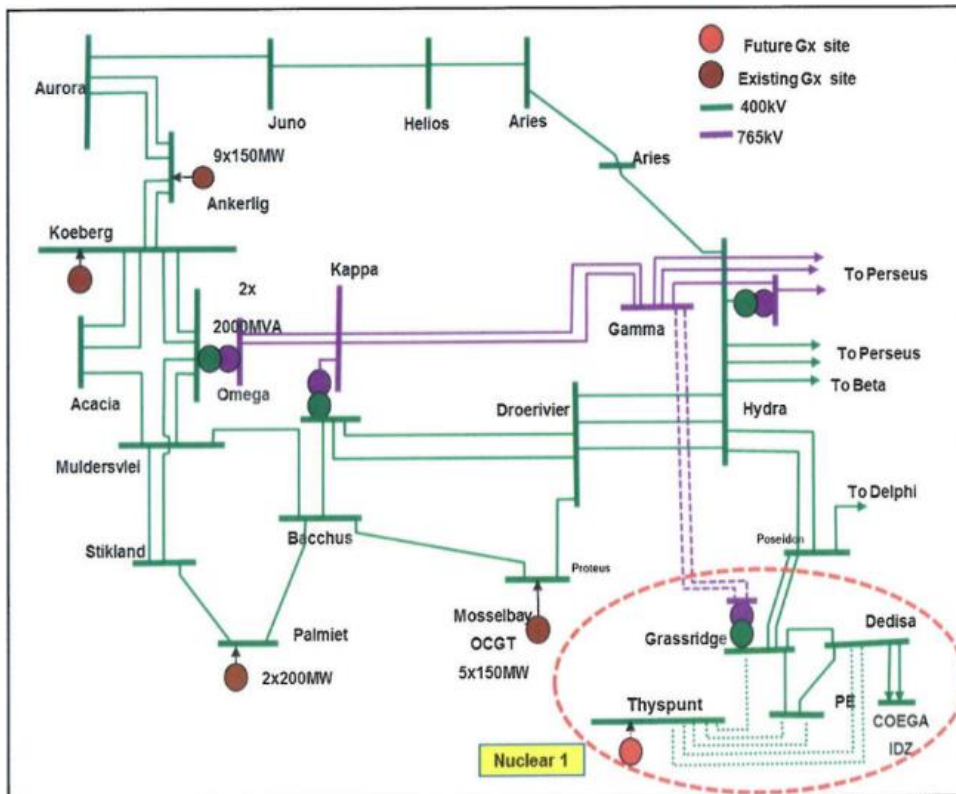


Figure 6-5 – Transmission Integration at Thyspunt

Transmission Integration at Bantamsklip

Bantamsklip is a very remote location with respect to both the existing network and any large load centre. There is no large, concentrated load development expected in the surrounding areas of the site in the foreseeable future. Four 765 kV transmission lines will have to be constructed from the site to the Kappa 765 kV substation, giving a total of around 2 211 km of 765 kV lines required. The NPP will be linked to the 765 kV substation at the Kappa site and will not be able to provide a 400 kV injection to support the network in this part of the Western Cape for future development. The 400 kV transmission support will have to come from somewhere else. This is depicted in Figure 4-10. If required for the NPP, then it will have to be integrated into the power system with the current recommended 765 kV transmission integration plan.

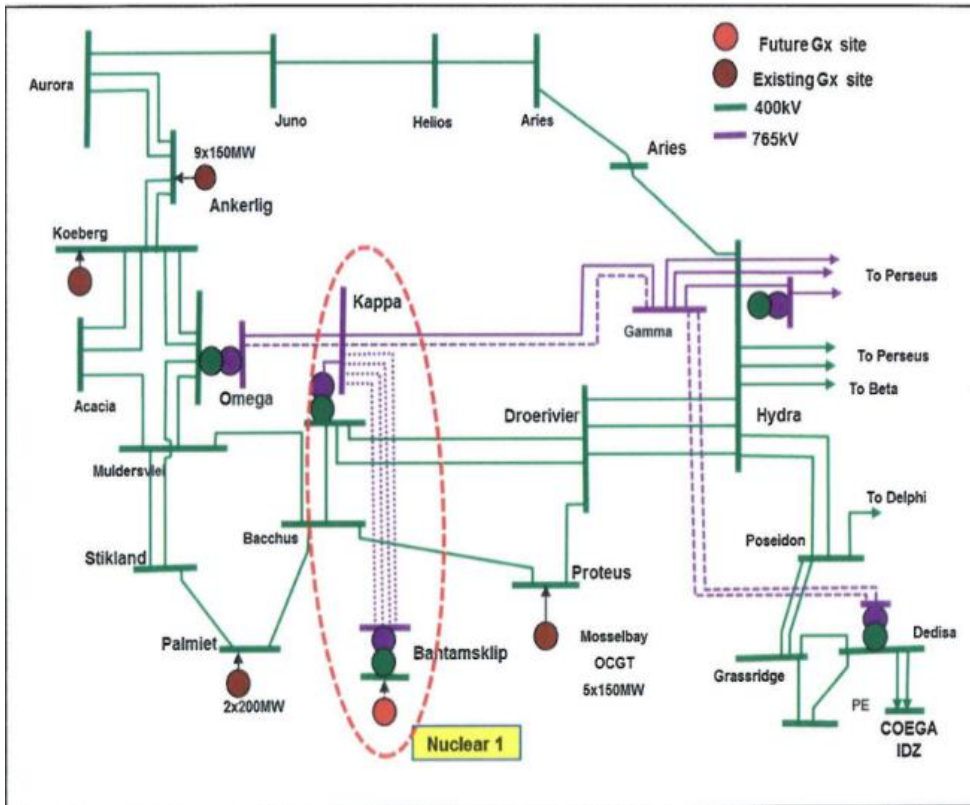


Figure 6-6 – Transmission Integration at Bantamsklip

Table 6-5 provides a comparison of the grid connection requirements for both sites.

Table 6-5 – Grid connection comparison between Bantamsklip and Thyspunt

FACTOR	BANTAMSKLIP	THYSPUNT
Line length required	2 211 km of 765 / 400 kV lines respectively	1 400 km of 765 / 400 kV lines respectively
EIA and servitude difficulty	High (due to complex and sensitive terrain)	Medium
Implementation timeframe	Unlikely achievable before 2039 due to complex and sensitive terrain	Achievable before 2039 (60 months after EA and servitudes secured)
System Transient Response ¹²⁴	Good	Good
Impact on grid transfer capacity	Depends on grid strengthening of: ■ Cape Corridor Phase 4,5,6	Depends on grid strengthening of: ■ Cape Corridor phase 4,5,6 ■ Southern grid Gamma-Grassridge

¹²⁴ System transient response is the temporary behaviour of a system, such as a circuit or mechanical device, immediately following a sudden change in input or load before it settles into a steady state. It characterises how quickly and stably a system adjusts to new conditions.

FACTOR	BANTAMSKLIP	THYSPUNT
	■ Cape corridor transformer capacity assessment ■ Eastern Cape to KZN 765 kV ■ New Koeberg GIS (Weskusfluer)	■ Greater East London phase 3,4 ■ Eastern Cape to KZN 765 kV

6.4.2.2 Corridor

Corridor electricity transmission involves building high-capacity, long-distance powerlines to connect regions. Corridor transmission is about large-scale infrastructure for bulk power delivery and market integration. The transmission network capacity in the Western, Eastern, Northern Cape and parts of the North-West supply areas is severely constrained and would require substantial strengthening at local and corridor level to provide additional network capacity to integrate the new generation plants to the system.

The Eastern Cape corridor is strategically important due to its high-quality wind resources and proximity to coastal generation opportunities. Transmission infrastructure in the province primarily links generation nodes toward KwaZulu-Natal and onward to the national grid. Available transmission capacity in key parts of the Eastern Cape has largely been depleted, with limited additional capacity only achievable through curtailment arrangements or substantial new grid investment.

The Western Cape corridor plays a critical role in supplying power to the Cape Town metropolitan area. Transmission constraints in the Western Cape are pronounced, as generation growth has outpaced grid expansion.

The proposed transmission corridor development within South Africa is depicted in Figure 4-11.



Transmission losses refer to the reduction in electrical energy as it travels from the plant through the transmission and distribution network to end users. While nuclear plants generate large amounts of electricity efficiently, some of that energy is inevitably lost due to resistance in transmission lines, transformer inefficiencies, and heat dissipation. Globally, technical transmission and distribution losses typically range between 6–8% of the electricity generated, depending on grid infrastructure and distance from generation sites to consumers. In the case of nuclear power, these losses are not unique compared to other generation sources—they are a feature of the electrical grid itself. Modern high-voltage transmission systems are designed to minimise these losses, but they remain an unavoidable factor in delivering electricity from any power station to homes and industries.

¹²⁶ Jefferson, K. (2025). Unseen Losses: How Nuclear Power Stations Waste Energy. ShunWaste, December 9.

transmission corridors are considered in the site selection process to assess how they affect the project, creating an interlink between the generation facility and transmission planning.

6.4.2.3 **Comparative Assessment: Transmission and System Considerations in relation to Duynefontein¹²⁷**

Presented in Table 6-6 is a comparative assessment of Thyspunt and Bantamsklip from a transmission and integration perspective, also in relation to the future planned Duynefontein Nuclear Power Plant, highlighting the key factors informing site preference.

Table 6-6 – Thyspunt vs Bantamsklip Transmission & System Considerations

<u>Issue</u>	<u>Description</u>	<u>Geographically concentrated NPP (Duynefontein + Bantamsklip)</u>	<u>Geographically dispersed NPP (Duynefontein + Thyspunt)</u>
<u>Common cause transmission infrastructure risks</u>	<u>Transmission faults, corridor outages, voltage disturbances, or other network events may simultaneously affect co-located generating units, reducing overall system resilience. Concentration increases dependency on shared transmission corridors.</u>	<u>Less desirable – Increased risk of common-mode failure affecting multiple units and higher reliance on the same transmission corridors.</u>	<u>More desirable – Greater spatial separation reduces simultaneous impacts and improves resilience. Thyspunt provides geographic diversification relative to Duynefontein.</u>
<u>Proximity of generation to load centres</u>	<u>Long-distance power transfers increase losses and place pressure on voltage control, stability margins, and transfer capability.</u>	<u>Less desirable – Western Cape already hosts significant generation; concentration increases export requirements.</u>	<u>More desirable – Eastern Cape (Gqeberha region) has higher unmet demand, improving load balance and reducing transmission strain.</u>
<u>Cost of transmission infrastructure</u>	<u>Cost associated with integrating large-scale generation into the national grid.</u>	<u>Less desirable – Integration of ~5,900 MW at Bantamsklip estimated at ~1.8× more (NTCSA indicative estimates).</u>	<u>More desirable – Lower grid integration cost, making Thyspunt more efficient.</u>

¹²⁷ Section added as a result of Authority and Stakeholder Comments received.

<u>Issue</u>	<u>Description</u>	<u>Geographically concentrated NPP (Duynefontein + Bantamsklip)</u>	<u>Geographically dispersed NPP (Duynefontein + Thyspunt)</u>
<u>Transmission servitude environmental impact</u>	<u>Extent of new transmission corridors required and associated environmental footprint.</u>	<u>Less desirable – Requires ~1.9× more 765 kV lines, resulting in greater servitude impacts.</u>	<u>More desirable – Reduced need for high-voltage expansion, lowering environmental disturbance.</u>
<u>Power system stability</u>	<u>Nuclear generation contributes inertia, system strength, synchronising torque, and voltage support, strongest near injection point.</u>	<u>Less desirable – Benefits concentrated in Western Cape with diminishing returns.</u>	<u>More desirable – Strengthens Eastern Cape grid and improves national robustness.</u>

Thyspunt is the preferred site as it supports geographically dispersed generation, strengthens the national grid, reduces infrastructure costs, and limits transmission-related environmental impacts. Bantamsklip is less favourable due to concentration of generation, higher costs, greater transmission impacts, and lower overall system benefit.

6.4.3 ACCESS ROUTE ALTERNATIVES

6.4.3.1 Bantamsklip

The road network within ~50 km of the site is dominated by the N2 (national), R43, R316, R326 and R317 (provincial) roads. The Bantamsklip site can be accessed via the surrounding provincial road network. Except for the R317, which is gravel, all other provincial roads are surfaced and regularly maintained by the relevant road authorities. The existing road network and possible link roads to the site are illustrated in Figure 6-8.

The Route between Cape Town Harbour and Bantamsklip is longer and topographically more complex, with the need to traverse Sir Lowry's pass being particularly challenging. This route therefore poses major technical difficulties to heavy load transportation vehicles and thus has a greater associated safety risk (to other road users and transportation staff). There are also significant bridge obstructions and steep grades along this route.



Figure 6-8 – Existing Road Links (Bantamsklip)

Existing off-site access routes will be used and upgraded for the Bantamsklip site. Access to the site is possible directly off the R43 as illustrated in Figure 6-9.



Figure 6-9 – Possible Site Access at Bantamsklip

6.4.3.2 Thyspunt

The existing transport network within ~50 km of the Thyspunt site is dominated by the N2 (national), R102 and R330 (provincial) roads.

The Route between Gqeberha and Thyspunt is shorter and topographically less complex. This route poses fewer technical difficulties to heavy load transportation vehicles and thus has a smaller associated safety risk (to other road users and transportation staff). There are no bridge obstructions and steep grades along this route.

The Thyspunt site can be accessed via the surrounding provincial road network. The provincial roads are unsurfaced and require regular maintenance by the relevant road authorities. The existing road network and possible link roads to the site are illustrated in Figure 6-10.

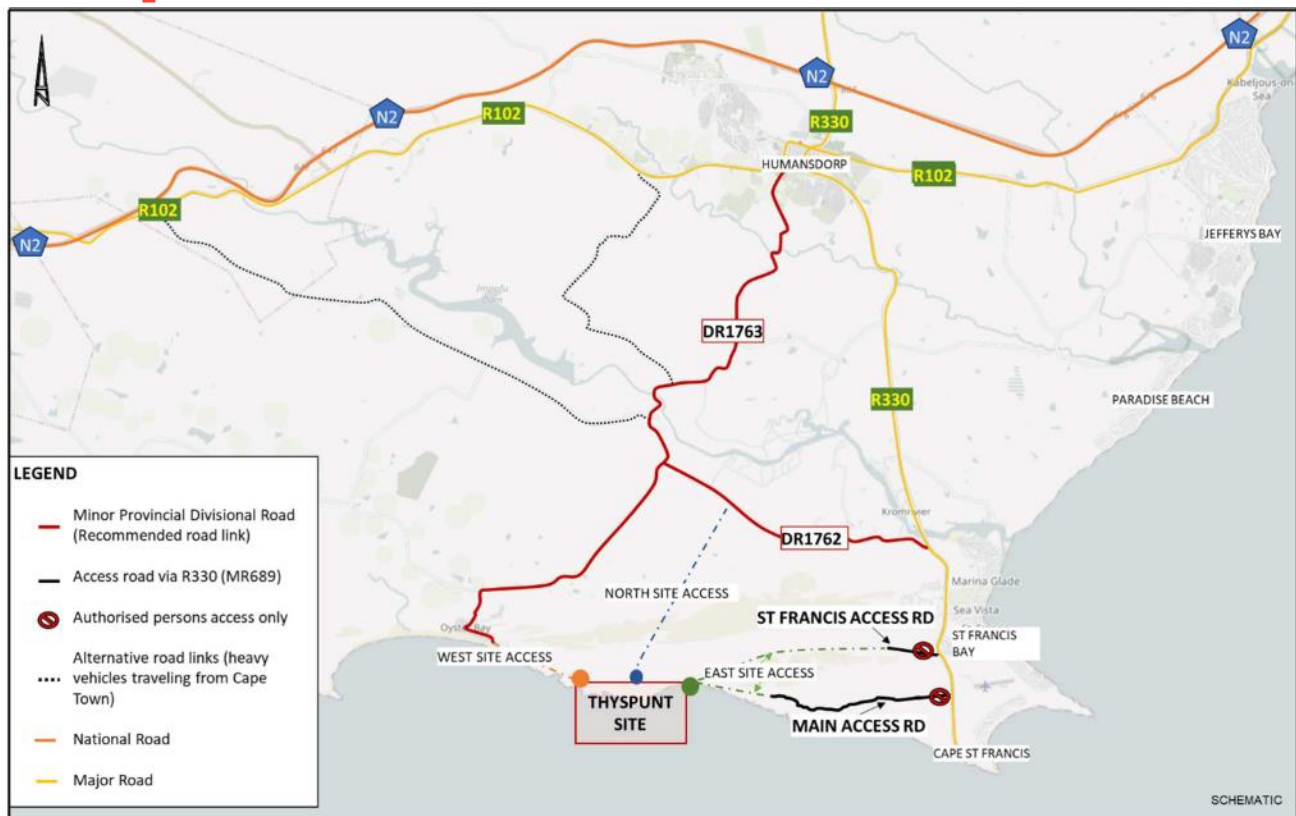


Figure 6-10 – Existing Road Links Route Alternatives (Thyspunt)

There are five proposed alternative access route options to the Thyspunt site as depicted in Figure 6-11 and Figure 6.12, i.e. the eastern (x3), western and northern access roads. However, the northern access road is heavily restricted by the sensitive dune environment, with the eastern and western roads already existing.

Route alternatives will be further assessed during the EIA phase.



Figure 6-11 – Alternative Access Roads (Thyspunt)



Figure 6-12 – Additional Alternative Access Roads (Thyspunt)

6.4.4 ENERGY ALTERNATIVES

The primary need addressed by the proposed NPP is the provision of large-scale, dispatchable electricity capacity capable of supporting system adequacy, reliability, and security of supply over long operating lifetimes. This system-reliability requirement is fundamental and constitutes the principal basis on which energy alternatives are defined and screened.

All energy generation sources are important for the energy mix as per the IRP of 2025. However, in terms of suitability, not all sources of energy are feasible in the proposed areas or are able to generate 3 000 + MW of electricity. The NPP project aligns with the IRP of 2025 regarding the generation of 5 200 MW of electricity from a nuclear source by 2039, as this project intends to generate up to 5 200 MW of electricity. This is detailed in Table 6-7.

Table 6-7 – Energy Alternatives

TECHNOLOGY	DESCRIPTION	ADVANTAGES	DISADVANTAGES	SOUTH AFRICAN CONTEXT	ALIGNMENT TO IRP 2025	RELEVANCE TO LOCATIONS/ SITE CONTEXTUALISATION
BASELOAD POWER						
Coal	Coal-fired power stations are the dominant source of electricity in South Africa, accounting for about 80% of generation. Eskom's plants are designed to burn low-grade coal, which would otherwise go to waste, making use of the country's abundant reserves. The process involves pulverising coal into fine powder, burning it in boilers to produce heat, and converting water into steam. This steam drives turbines connected to generators, which produce electricity that is distributed through powerlines. South Africa produces around 224 million tonnes of coal annually, with more than half used for electricity generation, and reserves are estimated at 53 billion tonnes, ensuring a long-term supply. Fluidised Bed Combustion (FBC) is a more advanced technology used in some power plants. In this method, coal or biomass is burned in a suspended bed of particles, creating turbulent mixing that enhances chemical reactions and heat transfer. Limestone is added during combustion to remove sulphur, and the process operates at cooler temperatures than conventional coal plants. These lower temperatures reduce the emission of nitrogen oxides (NOx), making FBC a cleaner and more efficient alternative to traditional coal-fired power generation.	South Africa has abundant coal reserves.	Coal has one of the greatest waste problems of all energy sources. Waste includes sulphur and nitrogen oxides (far less with FBC technologies), organic compounds, heavy metals, radioactive elements, GHGs and large amounts of ash.	Pulverised coal-fired power stations currently provide approximately 80 % of the electricity produced in South Africa. Based on the availability of coal in South Africa, and its relative price advantage, coal-fired power stations will continue to provide the majority contribution to the supply of electricity in South Africa in the near future. However, in order for coal to be financially viable, coal-fired power stations need to be located in close proximity of the coal mines to avoid the costly transportation of coal over long distances by road or rail. Coal-fired power stations are therefore currently located in the Northern and Eastern parts of South Africa. Future coal-fired power stations would also likely to be located in the same regions of South Africa. Coal-fired power stations are therefore not a viable option for power generation in the Cape as long powerlines are required to transfer electricity from power stations in the coal rich areas to load centres located away from the pitheads, which in turn implies high capital costs and transmission losses (essentially the energy required to transmit electricity along powerlines). FBC technology has not yet been implemented in South Africa. Studies are underway to investigate its viability in the South African electricity supply context. Similar to pulverised coal power stations, FBC technology, if implemented is likely to be located near to the coal fields and hence is not appropriate for power generation on the Cape coast because of the transportation costs associated with the coal derived primarily on the eastern interior of South Africa.	According to IRP 2025, the country is progressively phasing out coal-fired power generation in favour of cleaner energy technologies. The plan sets a clear trajectory toward achieving net-zero emissions, with renewable energy forming the backbone of future electricity supply and coal playing a diminishing role in the energy mix. IRP 2025 lowered coal's share to under 45%. Aims for more aggressive coal plant decommissioning aligned with JET goals are also highlighted.	A coal-fired power station is not fit for the project location sites as both sites are located far away from existing coal reserve areas in the country. Furthermore, the country is slowly phasing out coal-fired power stations.
		Coal-fired power stations are proven technology.	Coal combustion contributes significantly to anthropogenic climate change through the emission of large quantities of carbon dioxide (CO ₂), a long-lived <u>GHG</u> that enhances the atmospheric greenhouse effect by trapping outgoing infrared radiation, thereby driving global warming. Continued reliance on coal-fired power generation is widely regarded as misaligned with climate mitigation objectives and is associated with elevated transition, regulatory and stranded-asset risks.			
		South Africa's infrastructure to generate electricity from coal is well established.	Building a coal-fired power station is a lengthy and expensive process, with the operation being an expensive process as well.			
		FBC technologies has a wide range of fuel adaptability, which allows for the use of low-grade coal, biomass and waste tyres.	The transportation of coal is very expensive and hence coal-fired power stations are located as close to the mines as possible in order to maintain their economic viability. Thus, coal-fired power stations are located inland and hence if wet cooling is used, power stations use considerable quantities of scarce water resources, or if dry cooling is used, the power stations are deemed relatively inefficient, and water is used in relatively less quantities.			
		FBC technologies allow for fuel flexibility as lower grade (high sulphur content) coal can be used and coal can be supplemented with different types of biomass.	South Africa's coal fields are concentrated in Mpumalanga (east of Gauteng) and Limpopo Provinces, which limits the location options for power stations. Requires expensive air pollution controls (e.g. Particulate matter)			
	Open Cycle Gas Turbine (OCGT): Air is compressed, mixed with fuel, burned,	Produces less CO ₂ than coal (≈50% less) and oil (≈30% less). Lower SOx and NOx emissions.	Still emits GHGs. Methane leaks are highly damaging (much more potent than CO ₂).	In South Africa, the absence of large natural gas reserves has resulted in	IRP 2025 positions gas power as a transitional energy source	There is an uncertainty of supply and need for

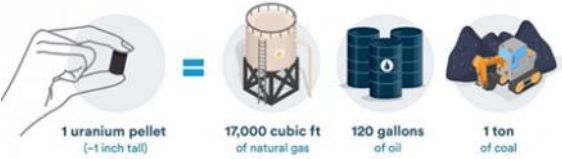
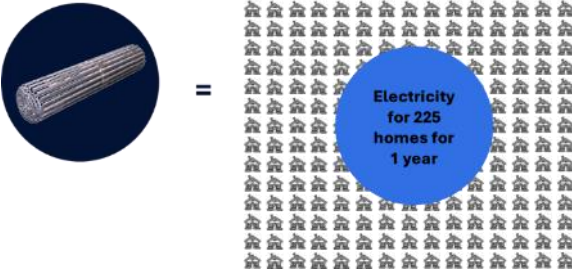
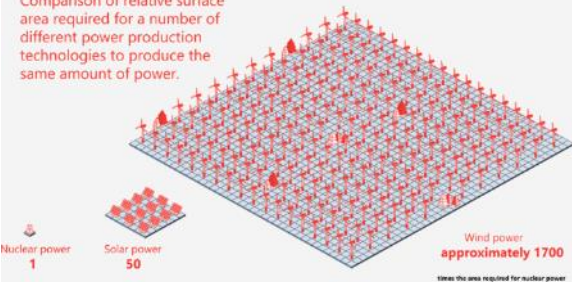
TECHNOLOGY	DESCRIPTION	ADVANTAGES	DISADVANTAGES	SOUTH AFRICAN CONTEXT	ALIGNMENT TO IRP 2025	RELEVANCE TO LOCATIONS/ SITE CONTEXTUALISATION
Gas ^{128,129,130}	and the hot gases drive a turbine. Exhaust is released directly.	Highly efficient in combined cycle systems. Can quickly ramp up or down, making it suitable for both baseload and peak demand.	Less efficient than renewables (wind, solar) in terms of sustainability.	existing OCGT plants relying on diesel, making them extremely costly to operate for extended periods. Consequently, OCGTs are used only to meet peak demand and provide emergency power. CCGT technology is not currently deployed in South Africa due to insufficient indigenous natural gas resources and the high cost of imports. Similarly, IGCC technology has not been adopted because of its high capital requirements and limited commercial maturity. At present, South Africa does not operate any power stations fuelled by natural gas, primarily due to the lack of domestic supply and the expense of imported gas. To address this, the Department of Minerals and Energy (DME) and the South African Gas Development Company (iGas) have been exploring the feasibility of an integrated power project within the Coega Industrial Development Zone (IDZ) near Gqeberha. A planned Liquefied Natural Gas (LNG) terminal at the Port of Ngqura will enable gas supply to industries in the Coega IDZ and, eventually, to the wider region. Together with electricity generation, this initiative aims to establish a regional energy hub that supports diverse users and strengthens South Africa's energy mix.	for South Africa, intended to provide flexible generation capacity to complement renewables, but it acknowledges challenges around cost, infrastructure, and long-term sustainability. IRP 2025 raised the gas load factor to 50%, increasing the role of gas plants for flexibility. However, gas is seen as a short- to medium-term solution, with the IRP emphasising that long-term reliance should shift toward renewables and storage technologies.	infrastructure which would not make the selected sites currently suitable for gas power generation. Reliance on imported liquefied natural gas (LNG) raises concerns about price volatility and energy security. Expansion of gas power depends on developing import terminals, pipelines, and storage facilities, as South Africa has limited domestic natural gas reserves.
	Combined Cycle Gas Turbine (CCGT): Uses both gas turbine and steam turbine: exhaust heat from the gas turbine produces steam to drive a second turbine.	Well-developed infrastructure in many regions. Reliable supply and stable electricity generation.	Dependence on pipelines and imports can create vulnerabilities.			
	Integrated Gasification Combined Cycle (IGCC): Coal or natural gas is converted into syngas, which is cleaned and burned in a combined cycle system.	Cleaner combustion compared to coal and oil. Can act as a transitional fuel toward renewables.	Extraction methods (e.g., fracking) can contaminate groundwater and cause environmental harm.			
	Natural Gas: Direct combustion of natural gas in turbines or engines to produce electricity.	Lower operating costs than coal plants. Often cheaper than oil.	Price volatility in global markets can affect affordability.			

¹²⁸ Department of Mineral Resources and Energy (DMRE) (2025). Integrated Resource Plan 2025. Government Gazette No. 6767, 28 October 2025. Pretoria: Government of South Africa.
¹²⁹ BankBazaar (2026). 14 Advantages and Disadvantages of Natural Gas. Available at: https://www.globalbioenergy.org/natural-gas-pros-and-cons/?utm_source=copilot.com.
¹³⁰ GBEP (2025). Natural Gas Pros and Cons: 6 Benefits & Disadvantages. Available at: https://www.environmentalscience.org/natural-gas?utm_source=copilot.com.

TECHNOLOGY	DESCRIPTION	ADVANTAGES	DISADVANTAGES	SOUTH AFRICAN CONTEXT	ALIGNMENT TO IRP 2025	RELEVANCE TO LOCATIONS/ SITE CONTEXTUALISATION														
Nuclear ¹³¹	Nuclear power is a method of generating electricity by harnessing the energy released during nuclear fission, the process in which the nucleus of a heavy atom such as uranium-235 splits into smaller parts. This reaction produces a large amount of heat, which is used to convert water into steam. The steam then drives turbines connected to generators, producing electricity. Unlike fossil fuels, nuclear power does not rely on combustion, meaning it generates electricity without releasing carbon dioxide during operation. There has been an explicit inclusion and adjustment for nuclear power technologies. It allows for firm, dispatchable, high-availability generation with low operational GHG emissions.	NPPs produce extremely low GHG emissions during operation, making them one of the cleanest large-scale energy sources available. Greenhouse gas emissions Measured in emissions of CO₂ equivalents per gigawatt-hour of electricity over the lifecycle of the power plant. 1 gigawatt-hour is the annual electricity consumption of 150 people in the EU. <table><tr><th>Energy Source</th><th>GHG Emissions (tonnes)</th></tr><tr><td>Coal</td><td>970</td></tr><tr><td>Gas</td><td>720</td></tr><tr><td>Nuclear</td><td>24</td></tr><tr><td>Wind</td><td>11</td></tr><tr><td>Solar</td><td>6</td></tr><tr><td>Natural Gas</td><td>53</td></tr></table> 132	Energy Source	GHG Emissions (tonnes)	Coal	970	Gas	720	Nuclear	24	Wind	11	Solar	6	Natural Gas	53	Nuclear power plants are capital-intensive infrastructure projects with extended development and construction periods, resulting in lower flexibility relative to generation technologies that can be deployed more rapidly.	South Africa operates the only commercial NPP on the African continent, the Koeberg NPS near Cape Town. Commissioned in the 1980s, Koeberg remains central to the country's energy mix, and under IRP 2025 its lifespan has been extended to 2045, while government explores options for additional nuclear capacity. Koeberg has a demonstrated history of safe and reliable operation under the oversight of the National Nuclear Regulator, supported by periodic international peer reviews conducted by the International Atomic Energy Agency. An existing national radioactive waste disposal facility is already in operation at Vaalputs in the Northern Cape, which has been licensed by the National Nuclear Regulator for the disposal of low-level radioactive	IRP 2025 confirms that nuclear power will remain part of South Africa's long-term energy mix. The plan extends the life of Koeberg Nuclear Power Station to 2045 and outlines a pathway for up to 5 200 MW of new nuclear capacity.	South Africa's nuclear site investigations began with the NSIP in the 1980s, which assessed most of the country's coastline in line with IAEA guidelines. This process identified five candidate sites suitable for nuclear power stations, allowing Eskom to secure land and conduct detailed studies. In 2025, DFFE authorised the Duynefontyn site, adjacent to Koeberg NPS, for the proposed Nuclear 1 project. As part of the EA process, four sites were considered: Brazil and Schulpfontein (Northern Cape), Bantamsklip (Western Cape), and Thyspunt (Eastern Cape). Brazil and Schulpfontein were deemed unsuitable,
	Energy Source	GHG Emissions (tonnes)																		
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	Nuclear energy provides a steady and dependable supply of baseload electricity.	The radioactive waste produced by nuclear reactors remains hazardous over very long timeframes, and safe long-term storage solutions are technically complex and politically contentious.																		

¹³¹ Anthony Ciccone (Phd, PEng). WSP. (2026). Siting of Nuclear Power Plants. Energy Indaba, Cape Town.

¹³² Electricity shares are given for 2021. Data sources: Markandya & Wilkinson (2007); UNSCEAR (2008; 2018); Sovacool et al. (2016); IPCC AR5 (2014); UNECE (2022); Ember Energy (2021). OurWorldinData.org.

TECHNOLOGY	DESCRIPTION	ADVANTAGES	DISADVANTAGES	SOUTH AFRICAN CONTEXT	ALIGNMENT TO IRP 2025	RELEVANCE TO LOCATIONS/ SITE CONTEXTUALISATION
		A small amount of nuclear fuel can generate an enormous amount of energy, allowing nuclear power to deliver vast output with minimal fuel compared to fossil fuels. One kilogram of 4% enriched fuel-grade uranium can displace the equivalent of 100 tons of high-grade coal. Fast Facts on NUCLEAR ENERGY Nuclear fuel is extremely energy dense.  1 uranium pellet (~1 inch tall) = 17,000 cubic ft of natural gas = 120 gallons of oil = 1 ton of coal U.S. Department of Energy Office of NUCLEAR ENERGY LEARN MORE energy.gov/ne Data source: U.S. Energy Information Administration One rod provides electricity for 225 homes for a year.  Low Land Use: Nuclear energy is the most land-efficient source. A 1 000 MW nuclear energy facility requires about 340 ha compared to a solar farm (2000 to 5000 ha) or wind (20 000 to 50 000 ha). Comparison of relative surface area required for a number of different power production technologies to produce the same amount of power.  Nuclear power 1 Solar power 50 Wind power approximately 1700 Visualize the area required for nuclear power	Public awareness: Despite strict regulations, accidents like Chernobyl, Three Mile Island and Fukushima have left lasting fears about radiation exposure and environmental damage, which continue to shape public perception of nuclear energy. Storing and transporting nuclear waste is challenging because it remains highly radioactive and requires heavily shielded, secure containers to prevent radiation exposure. Additionally, strict regulations and safety concerns make logistics and long-distance transport complex and costly.	waste. The facility is operated by the National Radioactive Waste Disposal Institute under a valid nuclear installation licence, providing an established regulatory and institutional framework for radioactive waste management in South Africa.		leaving Bantamsklip and Thyspunt as the two alternatives for further assessment during this process.

TECHNOLOGY	DESCRIPTION	ADVANTAGES	DISADVANTAGES	SOUTH AFRICAN CONTEXT	ALIGNMENT TO IRP 2025	RELEVANCE TO LOCATIONS/ SITE CONTEXTUALISATION												
		Fuel Reusability: One of the most common fuels used in a nuclear energy project is Uranium-235. When consumed for energy, it does not entirely expire when placed in the nuclear reactor, making it possible to reuse (i.e. Gen IV reactors). In terms of the fuel cycle, one soda can is all the waste that one person will generate during their lifetime if they were to use nuclear energy to power their entire life. Nuclear Waste: on the global scale, plans are in place to handle nuclear waste including Deep Geological Repositories (DGRs) for HLW and above/near ground LLW management facilities. New Investments: The supply chain still requires significant investment as New Nuclear Builds (NNB) and SMRs are being designed which require newer, safer fuels. Job Creation: On a global scale, nuclear energy supports millions of jobs supporting local economies. It creates more jobs per 1 000 MW generating capacity than other forms of energy. HOW MANY JOBS DOES NUCLEAR ENERGY CREATE? NEI NUCLEAR ENERGY INSTITUTE 50 JOBS 50 JOBS 190 JOBS 100-450 JOBS 470 JOBS 500 JOBS WIND GAS COAL HYDRO SOLAR NUCLEAR Costs: Nuclear remains one of the most affordable electricity sources worldwide. While nuclear generating stations require high upfront capital investment, their long life and low costs for fuel, operations and maintenance lead to low power costs in the long run. COST OF ENERGY BY SOURCE IN ONTARIO IN 2022 <table><thead><tr><th>Source</th><th>Cost (/kWh)</th></tr></thead><tbody><tr><td>HYDRO</td><td>6.1c</td></tr><tr><td>NUCLEAR</td><td>10.1c</td></tr><tr><td>NATURAL GAS</td><td>11.3c</td></tr><tr><td>WIND</td><td>15.4c</td></tr><tr><td>SOLAR</td><td>50.2c</td></tr></tbody></table> SOURCE: Ontario Energy Board, "Regulated Price Plan Price Report from November 1, 2022 to October 31, 2023," 2023, p. 19	Source	Cost (/kWh)	HYDRO	6.1c	NUCLEAR	10.1c	NATURAL GAS	11.3c	WIND	15.4c	SOLAR	50.2c				
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		Safety: Nuclear power plants are regarded as among the safest energy sources because they are designed with multiple layers of protection, strict international regulations, and decades of operational experience that have kept serious accidents extremely rare. In fact, studies show nuclear energy has one of the lowest accident and fatality rates compared to fossil fuels and even some renewables. Death rate from accidents and air pollution Measured as deaths per terawatt-hour of electricity production. 1 terawatt-hour is the annual electricity consumption of 150,000 people in the EU. <table><tr><th>Energy Source</th><th>Deaths per TWh</th><th>% of Global Electricity</th></tr><tr><td>Coal</td><td>24.6</td><td>36%</td></tr><tr><td>Oil</td><td>18.4</td><td>3%</td></tr><tr><td>Natural Gas</td><td>2.8</td><td>22%</td></tr><tr><td>Biomass</td><td>4.6</td><td>2%</td></tr><tr><td>Hydropower</td><td>1.3</td><td>12%</td></tr><tr><td>Wind</td><td>0.04</td><td>7%</td></tr><tr><td>Nuclear energy</td><td>0.03</td><td>10%</td></tr><tr><td>Solar</td><td>0.02</td><td>4%</td></tr></table> 1230-times higher than solar 613-times higher than nuclear energy 171,000 deaths from Banqian Dam failure in 1975, China Includes deaths from Chernobyl and Fukushima disasters 133	Energy Source	Deaths per TWh	% of Global Electricity	Coal	24.6	36%	Oil	18.4	3%	Natural Gas	2.8	22%	Biomass	4.6	2%	Hydropower	1.3	12%	Wind	0.04	7%	Nuclear energy	0.03	10%	Solar	0.02	4%				
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Solar ^{134,135,136,137}	In South Africa, most areas average more than 2 500 hours of sunshine per year and the average solar radiation levels range between 4.5 and 6.5 kWh/m² in one day. This renders South Africa’s local solar resource one of the highest in the world. Solar energy is safe, ‘environmentally friendly’ and produces no emissions. It is the most readily accessible resource in South Africa and lends itself to a number of potential uses. South Africa’s solar-equipment industry is developing, for example, the annual photovoltaic (PV) panel-assembly with a total capacity of five MW. In addition, there are a number of solar water heater manufacturing companies. Water-heating accounts for a third to half of the energy consumption, in average households. Modelling indicates that the introduction of solar water heating can ameliorate	Reduces GHG emissions and is a sustainable energy source. PV is modular (rooftops to large farms). PV technology can be produced in any desired amount, from a few milliwatts to many megawatts. Rooftop PV avoids land competition. CSP is suitable for utility-scale. CSP can store thermal energy (molten salts). MW scale power generation possible, up to potentially 200 MW per CSP plant. PV pairs with batteries. PV costs have dropped dramatically, now among cheapest electricity sources. CSP has no fuel cost associated with it.	Solar is dependent on sunlight with limited generation at night or during cloudy weather. Without battery storage, the energy is not available all the time. Demand can be highest when least available, e.g. winter solar heating. CSP requires large, centralised plants and PV farms requires significant land. Utility-scale PV and CSP require large land areas, potentially affecting ecosystems. Storage adds cost and complexity. CSP storage is limited to specific conditions. CSP remains expensive and less competitive, and PV still requires storage/grid upgrades.	Solar thermal plants are a well-established technology, but their current cost per kilowatt-hour remains relatively high compared with coal and nuclear power. Because of technology advancements, costs may reduce over the next decade or two. To address this, the Department of Physics at the University of Johannesburg has developed and patented an innovative manufacturing technique for producing Copper-Indium-Gallium-Diselenide (CIGS) solar panels at significantly lower cost. These panels are not only cheaper to manufacture than conventional silicon-based panels, but the process is also theoretically scalable to industrial production. A 60 W panel could be produced for about R490 (roughly R8 per watt), compared with imported panels that	IRP 2025 places solar power at the centre of the country’s future energy mix, targeting over 25 GW of new solar PV capacity by 2039, with more than 11 GW to be installed by 2030. This reflects government recognition of South Africa’s abundant solar resource and the need to diversify away from coal.	Both sites are coastal dune environments, making it unstable for wind and solar facilities.																											

¹³³ Death rates from fossil fuels and biomass are based on state-of-the art plants with pollution controls in Europe and are based on older models of the impacts of air pollution on health. This means that these death rates are likely to be very conservative. For further discussion, see: OurWorldinData.org/safest-sources-of-energy.

¹³⁴ Global Solar Atlas (2019) South Africa – Solar resource and PV power potential maps. The World Bank Group, Solargis. Available at: <https://globalsolaratlas.info>.

¹³⁵ AmeriGEOSS Community Platform (2019) South Africa – Solar irradiation and PV power potential maps. Available at: <https://data.amerigeoss.org/dataset/south-africa-solar-irradiation-and-pv-power-potential-maps>.

¹³⁶ Marthinusen, L. (2023) Advantages and Disadvantages of Solar Energy in South Africa. SolarWow. Available at: <https://solarwow.co.za>.

¹³⁷ JUP Solutions (2023) Analysing the advantages and disadvantages of solar power. JUP Solutions. Available at: <https://jupsolutions.co.za>.

TECHNOLOGY	DESCRIPTION	ADVANTAGES	DISADVANTAGES	SOUTH AFRICAN CONTEXT	ALIGNMENT TO IRP 2025	RELEVANCE TO LOCATIONS/ SITE CONTEXTUALISATION
	the situation substantially and switching from electrical to solar water heating can, therefore, have significant economic and environmental benefits. As part of a six-month pilot project, the Central Energy Fund (CEF) commenced a rollout programme of solar heaters in March 2007, with the focus on middle-to high-income households in Gauteng, the Western Cape and KwaZulu-Natal. Eskom fully supports such initiatives. Solar PV technology converts sunlight directly into electricity using semiconductor materials, typically silicon-based solar cells. When sunlight strikes the cells, it excites electrons, creating an electric current that can be fed into the grid or used locally. PV systems are modular, ranging from small rooftop installations to large utility-scale solar farms. Concentrating Solar Power (CSP) uses thousands of large two axes tracking mirrors (known as heliostats) or lenses to concentrate sunlight onto a receiver, where it is converted into heat. This thermal energy is then used to produce steam that drives a turbine connected to a generator, similar to conventional thermal power plants. CSP plants often include thermal storage systems (e.g., molten salt), allowing them to generate electricity even after sunset.	PV requires minimal water, ideal for arid regions.	CSP often needs significant water for cooling, limiting deployment in dry areas.	cost R35–R40 per watt. A prototype has already been built, the pilot plant has delivered its first units, and a full-scale facility is under construction in Germany, with panels expected to reach South Africa by mid-2008. Solar thermal plants also offer higher availability than wind generators, since stored heat can be used to generate electricity even when the sun is not shining. However, they require vast fields of mirrors to concentrate solar energy effectively. CSP technologies have been identified as promising for large-scale deployment. Environmental and technical studies have highlighted the Upington area in the Northern Cape—one of the world’s richest solar resource regions—as a prime location for such a facility. Eskom has completed an Environmental Impact Assessment and secured all necessary authorisations for a CSP plant in the Northern Cape. The planned facility will have a maximum capacity of 100 MW, requiring approximately four square kilometres of land. There are currently a few CSP facilities in SA, as follows: ▪ Redstone CSP (100 MW) ▪ Kathu Solar Park (100 MW) ▪ KaXu Solar One (100 MW) ▪ Xina Solar One (100 MW) ▪ Bokpoort CSP (50 MW) ▪ Khi Solar One (50 MW) ▪ Karoshoek Solar One		
		PV works in most climates, even with clouds.	CSP requires strong direct sunlight (deserts, dry climates only).			
		PV is simple, low-maintenance and widely deployable.	Both are intermittent – CSP more reliable but complex and costly.			
		The energy used to make a PV panel is recovered within 1-2 years of operation, beyond which a further 13-18 years of net energy production remain.	Does require special materials for mirrors/panels that can affect environment.			
		The supporting materials of PV panels, i.e. glass could in principle be recycled into new panels at the end of the lifetime of a panel.				
Wind ^{138,139,140}	Harnessing the wind, through wind turbines, produces wind energy. It is an energy source that is only practical in areas that have moderate strong and steady winds. South Africa has a moderate to strong wind potential,	Wind energy is clean and non-polluting, as it does not produce any by-products that could be harmful to the environment.	The inconsistent nature of the wind results in non-dispatchability.	Wind power is a relatively expensive form of power, with limited availability (periods in which power is generated). Wind energy in South Africa is currently expanding rapidly and becoming a central part of the	The IRP 2025 positions wind power as a cornerstone of South Africa’s energy transition, targeting more than 34 GW of new wind capacity by 2039, with around 14 GW to be installed by 2030. Wind, alongside solar PV,	The Impofu Wind Farm cluster is located within close proximity to the Thyspunt site, closer to the northern portion of the site. The closest wind turbines to the Bantamsklip site are
Wind energy can be generated during the day and at night.		Limited to small generator size; need many towers and thus large tracts of land.				
Well suited to rural areas.		Need expensive energy storage (e.g. batteries).				

¹³⁸ Landwehr, G., Lennard, C. and Engelbrecht, F. (2024) Wind energy potential of weather systems affecting South Africa’s Eastern Cape Province. Theoretical and Applied Climatology, 155, pp. 3581–3597. Springer Nature. Available at: <https://doi.org/10.1007/s00704-024-04830-z>.

¹³⁹ Engelbrecht, F. (2024) Introduction to Wind Energy Potential in South Africa’s Eastern Cape. Bohrium Research Summary. Available at: <https://link.springer.com>.

¹⁴⁰ South African Wind Energy Association (SAWEA) (2025) South Africa’s Wind Energy: Gaining Momentum and Scaling New Heights. SAWEA. Available at: <https://sawea.org.za>.

TECHNOLOGY	DESCRIPTION	ADVANTAGES	DISADVANTAGES	SOUTH AFRICAN CONTEXT	ALIGNMENT TO IRP 2025	RELEVANCE TO LOCATIONS/ SITE CONTEXTUALISATION
	particularly around coastal areas of Western Cape and Eastern Cape.	Wind turbines make use of simple technology in terms of design and building	Relative low usage factor.	country's renewable energy strategy. In terms of policy and momentum, South Africa has made significant strides in policy and regulatory reforms over the past two years, positioning wind power as a key component of its energy future rather than just a supplement. The South African Wind Energy Association (SAWEA) has been instrumental in driving these changes and ensuring wind energy is integrated into national planning. One of the most notable developments is the 330 MW Impofu wind power complex, located in the Kouga Local Municipality, which is targeting full commissioning in 2026. This project is part of a broader effort to expand capacity and reduce reliance on coal, while addressing South Africa's chronic electricity shortages and blackouts. Regarding energy security role, wind power is increasingly seen as a solution to South Africa's severe load-shedding crisis, offering a cleaner and more reliable alternative to fossil fuels. The government and private sector are investing heavily in new wind farms to stabilize supply and diversify the energy mix.	makes up the bulk of new renewable generation in the plan.	at the Blue Horizon Abalone Farm, used for their operations.
		Wind energy is competitive compared to other renewable energy sources.	Not cost competitive with conventional sources.			
		It is safe if properly maintained.				
Biomass ^{141,142,143}	Biomass energy is the energy obtained from the methane gas captured from landfill sites; farm, industrial, and household organic waste; plant material either raw or processed; agricultural residues; wood waste; paper trash; organic municipal solid waste; energy crops; from specially cultivated organisms and trees. Biomass is considered as renewable, given that only a short period of time is required to replace what is used as an energy	It is a renewable energy source.	The biomass units are generally quite small.	Various independent projects are currently underway to look at the use of bagasse, wood wastes and landfill gas for power generation projects. Biomass is used successfully where there are large quantities of biomass available such as in the sugar cane industry but is limited by the volumes of biomass required to generate an adequate power supply. The appreciable amount of bioenergy is used for non-commercial purposes, such as cooking and heating through	The IRP 2025 acknowledges biomass as part of South Africa's renewable energy mix but assigns it only a modest role compared to solar and wind. Biomass is recognised for its potential in waste-to-energy and agricultural residues, yet capacity allocations are limited due to cost, scalability, and resource constraints.	Biomass power generation is not suitable for the proposed sites as it produces small volumes of energy, which is inefficient and these are remote areas so transport costs associated with fuel will be expensive.
		It reduces the emissions of NOx and SOx in power generation.	If dedicated fast growing crops are used it must compete with other agricultural activities for land. It can therefore be an expensive fuel.			
		If waste is used, the cost of fuel is low.	Could potentially promote mono-agriculture in specific areas.			
		The use of waste optimises the usage of the biomass resource.	Fast growing crops need substantial land areas.			
			Inefficient if small plants are used.			

¹⁴¹ SolarReviews (2023). Advantages and Disadvantages of Biomass Energy. Available at: https://www.solarreviews.com/blog/biomass-energy-pros-and-cons?utm_source=copilot.com.

¹⁴² EnergySage (2022). Biomass Energy: Advantages and Disadvantages. Available at: https://www.energysage.com/about-clean-energy/biomass/pros-and-cons-biomass/?utm_source=copilot.com.

¹⁴³ Obileke, K., Mukumba, P., and Lesala, M. E. (2024). Advancement of Bioenergy Technology in South Africa. Energies, 17(15), 3823. <https://doi.org/10.3390/en17153823>.

	source. Electricity, heat or liquid fuels can be generated from biomass. However, biomass energy is more specific to small scale power generation.		Transport of fuel can be expensive. Proximity of the power plant to the fuel source is therefore an important consideration in terms of siting.	the burning of wood and tree branches, as well as burning charcoal and animal waste. With the total energy supply around 5880 PJ, bioenergy accounts for only 8.7%. This implies that a lot of biomass is already being used to supply energy. A few industrial-scale biogas plants use biogas from municipal organic waste, sewage, etc., to produce heat and electricity as well as transport fuel. Several hundred-scale biogas units provide heat for cooking; small and medium-sized businesses use waste from animal husbandry and abattoirs. Also, the country has many small- and medium-scale biodiesel plants that use waste cooking oil and an industrial scale of more than 20 million litres per annum of bioethanol plants. The System Johannesen Gasifier, which makes use of wood and other biomass, produces a virtually “tar free” gas, which is then used to power an electricity generator. This System Johannesen Gasifier was constructed in conjunction with Eskom’s Research Department in an effort to utilise small waste streams in the vicinity of rural communities. The System Johannesen Gasifier was developed as a self-contained, efficient and reliable alternative source of convenient energy for use in remote areas that are removed from the grid supply. A pilot plant at a rural sawmill in the Eastern Cape was being developed. The bio-energy initiatives are in the early stages of project development. Eskom is also currently investigating whether these options can be utilised for large-scale power generation. However, progress in the bioenergy sector has been slow compared to other renewable energy sources, such as solar and wind. Only four out of one hundred and five projects in the Independent Power Producer (IPP) database are biomass-powered. As a result, bioenergy presently contributes only 3% to South Africa’s total energy production, while solar energy accounts for approximately 61% and wind energy contributes around 29%. South Africa’s capacity for bioenergy production still lags that of other developing countries like Brazil, where biomass-generated		
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				electricity production exceeds 500 terawatt-hours (TWh) compared to South Africa's just over 200 gigawatt-hours (GWh). Bioenergy production in South Africa is still an emerging sector with significant growth potential.		
Ocean power ^{144, 145, 146, 147, 148}	Ocean power can manifest itself in wave, current, tidal and ocean-thermal sources. In the case of wave power, energy is produced through the creation of waves by wind blowing over the ocean surface. This energy is stored until it reaches the shallows and beaches of the coast, where it is released. Wave energy technology involves two basic elements, a collector to capture the wave energy and a turbo generator to transform the wave power into electricity.	The oceans represent a vast natural energy resource in the form of waves, currents, thermal gradients and other phenomena. The ocean, if harnessed, could produce 20 000 to 80 000 TWh of electricity, according to the International Energy Agency. That is more than the world's current energy consumption of almost 20 000 TWh. The International Energy Agency estimates that wave power could potentially produce 8 000 to 80 000 TWh yearly; ocean thermal energy could produce 10 000 TWh; osmotic power (from salinity differences) could produce 2 000 TWh and tides and marine currents could produce 1 100 TWh ¹⁴⁹ .	Individual wave power machines only generate small amounts of electricity.	Eskom is currently investigating the resource availability of wave power along the eastern and western coastline of South Africa. Wave data was captured and manipulated to determine the feasibility of wave energy as a future primary resource. The feasibility study provided positive results, and Eskom then considered different ocean energy conversion technologies in order to determine the best technology to be used on our coastlines. Thus far, no local or international technology has been found to be commercially viable for possible implementation in South Africa. However, Eskom will continue monitoring these technologies until such a time as technology proved to be technically sound and economically feasible for inclusion into Eskom's energy generation mix.	At the time of its release, the IRP 2025 did not allocate any significant role to ocean power (wave, tidal, or ocean current technologies) in South Africa's energy mix because it was believed to be in the pilot stage, with no commercially viable technology identified for inclusion in the national plan.	As a result of the successful completion of a feasibility study for a potential wave energy power station at the Port of Ngqura, the Eastern Cape is being considered for suitable locations for a site to deploy the second wave energy power station in the country.
			The various options are not commercially mature.			
			High costs compared to conventional technologies.			
			Possible high environmental impacts associated with construction and maintenance activities.			
			Limited to specific coastal/geographic locations.			
			Wave and current energy less predictable than tides.			

¹⁴⁴ Su, X., Chen, J., Yuan, L., Xu, W., Xiong, C., and Wang, X. (2025). Current Status of Development and Application of Ocean Renewable Energy Technology. Sustainability, 17(12), 5648. doi:10.3390/su17125648.

¹⁴⁵ Shadmani, A., Nikoo, M.R. & Gandomi, A.H. (2025). Ocean Wave Energy Technology: Fundamentals of Wave Farm Design. Springer Nature.

¹⁴⁶ Khan, J., Bhuyan, G., Moshref, A. & Harries, D. (2009). Ocean Energy: Global Technology Development Status. International Energy Agency – Ocean Energy Systems Implementing Agreement.

¹⁴⁷ Eco Wave Power (2026). Eco Wave Power Completes Feasibility Study for Wave Energy Project at Port of Ngqura, South Africa, with Encouraging Results. Eco Wave Power. Available at: https://www.ecowavepower.com/eco-wave-power-completes-feasibility-study-for-wave-energy-project-at-port-of-ngqura-south-africa-with-encouraging-results/?utm_source=copilot.com.

¹⁴⁸ Energy Global (2026). Eco Wave Power Completes Wave Energy Feasibility Study in South Africa. Energy Global. Available at: https://www.energyglobal.com/other-renewables/18022026/eco-wave-power-completes-wave-energy-feasibility-study-in-south-africa/?utm_source=copilot.com.

¹⁴⁹ Cho, R. (2017). Tapping into Ocean Power. Columbia Climate School. Available: <https://news.climate.columbia.edu/2017/02/14/tapping-into-ocean-power/#:~:text=The%20International%20Energy%20Agency%20estimates,currents%20could%20produce%201%2C100%20TWh.>

TECHNOLOGY	DESCRIPTION	ADVANTAGES	DISADVANTAGES	SOUTH AFRICAN CONTEXT	ALIGNMENT TO IRP 2025	RELEVANCE TO LOCATIONS/ SITE CONTEXTUALISATION
			Potential disruption to marine ecosystems.	A successful completion of a feasibility study for a potential wave energy power station at the Port of Ngqura, Eastern Cape, South Africa has been reported in February 2026. The feasibility study, conducted in collaboration with Africa Great Future Development Ltd (AGFDL), delivered encouraging results, indicating the technical potential to deploy approximately 8.3 MW of installed wave energy capacity along the port's breakwater infrastructure, subject to further development and permitting assessments. The study assessed site conditions, wave resource availability, and preliminary system configuration. The findings support the port's suitability for onshore wave energy implementation and highlight the opportunity to integrate wave energy generation using existing coastal structures. Following completion of the feasibility phase, AGFDL will now review the study results in detail, after which the parties will jointly evaluate potential next steps, including project structuring, regulatory pathways, and development timelines. The Port of Ngqura is one of the country's most strategic deep-water ports and is adjacent to the Coega Special Economic Zone (SEZ). The port's exposed breakwater and existing marine infrastructure make it a strong candidate for the first onshore wave energy deployment. AGFDL has since commenced discussions with the leadership at East London assessing suitable locations for a site to deploy the second wave energy power station in the country.		
	Hydropower is a renewable energy source that generates electricity by harnessing the kinetic and potential	Renewable and sustainable: Hydropower relies on the natural water cycle, making it a renewable source of energy.	Environmental impact: Large dams alter river ecosystems, affect fish migration, and disrupt sediment flows.	South Africa currently has two relatively large hydro power stations located on the Orange River, and	The IRP 2025 gives hydropower only a limited role in South Africa's future energy mix,	This form of energy generation is not fit for the proposed project locations.

TECHNOLOGY	DESCRIPTION	ADVANTAGES	DISADVANTAGES	SOUTH AFRICAN CONTEXT	ALIGNMENT TO IRP 2025	RELEVANCE TO LOCATIONS/ SITE CONTEXTUALISATION
Hydropower ^{150,151}	energy of flowing or falling water. It is one of the oldest and most widely used forms of renewable energy, providing reliable large-scale electricity with relatively low GHG emissions. Conventional hydropower and micro-hydropower differ mainly in scale, infrastructure, and application. Conventional hydropower involves large dams and reservoirs supplying national grids, while micro-hydro systems are small-scale installations (under 100 kW) designed for local or community use, often in rural areas.	Low <u>GHG</u> emissions: Once operational, hydropower plants produce minimal CO ₂ compared to fossil fuels.	Social displacement: Major projects have displaced an estimated 40–80 million people worldwide, often affecting indigenous communities.	some mini hydro power stations located in the Eastern Province. South Africa is a dry country with few rivers suitable for hydroelectric plants and hence it is unlikely that additional large hydro power stations will be constructed in South Africa. Eskom has concluded that micro-hydro is not a feasible option for South African circumstances as it is not economically viable at this stage.	recognising its potential for regional imports and small-scale domestic projects but not prioritising it compared to solar and wind. Large-scale hydro is constrained by geography and water availability, so the plan focuses mainly on imports from neighbouring countries and niche applications.	South Africa is a dry country with few sites suitable for hydropower.
		High efficiency: Hydropower plants can achieve efficiency rates of up to 90%, outperforming solar and wind systems.	Climate vulnerability: Droughts and changing rainfall patterns can reduce hydropower output by up to 60% in some regions.			
		Reliable baseload power (subject to hydrological conditions): Large hydropower plants can provide continuous and dispatchable electricity when sufficient water resources are available, unlike intermittent sources such as solar or wind.	High capital costs: Construction of dams and reservoirs requires significant investment and long timelines.			
		Energy storage: Pumped-storage hydropower acts as a large-scale battery, storing energy for peak demand periods.	Geographic limitations: Hydropower is only feasible in regions with suitable rivers and topography.			
		Economic benefits: Hydropower projects create jobs during construction and operation and can stimulate regional development.	Risk of accidents: Dam failures, though rare, can cause catastrophic flooding and loss of life.			

Treatment of Renewable Energy in the Screening of Alternatives

While renewable energy sources such as wind and solar photovoltaic generation are indispensable to South Africa's decarbonisation pathway and form a critical component of future electricity supply, they are not considered baseload or firm electricity sources when assessed in isolation. This is due to their inherent variability and dependence on meteorological conditions, which limits their ability to provide continuous, dispatchable electricity and to contribute predictably to system adequacy under all demand and operating conditions.

Renewable energy is therefore considered only within a firmed portfolio configuration, comprising utility-scale wind and solar generation combined with appropriate flexibility and firming measures, such as short- and long-duration energy storage and/or dispatchable firm capacity. This approach ensures that alternatives are compared on a functionally equivalent basis, namely their ability to deliver large-scale, firm and dispatchable electricity services comparable to the proposed development, rather than on annual energy output alone.

Table 6-8 – Screening-Level Comparison of Nuclear and Renewables-Led Portfolios

SCREENING CRITERION	NUCLEAR (PROPOSED DEVELOPMENT)	RENEWABLES-LED PORTFOLIO WITH FIRING
Primary functional service	Provision of large-scale, firm and dispatchable electricity capacity	Provision of firm electricity supply through a portfolio of variable renewable generation supported by storage and/or flexible firming resources
Dispatchability	Dispatchable within operational limits; output is controllable and schedulable	Wind and solar generation are not dispatchable; dispatchability is provided by storage systems and/or dispatchable firming plant
Dependence on weather conditions	Largely independent of short-term weather variability	Highly dependent on meteorological conditions; mitigated through storage, diversity, and firming
Contribution to system adequacy	High and predictable contribution due to high availability	Probabilistic and duration-limited contribution dependent on firming and storage
Planning classification	Commonly classified as firm or baseload low-carbon generation	Not classified as baseload in isolation; functionally comparable only when firmed
System stability and inertia	Provides synchronous inertia and grid-stabilising services inherently	Requires additional technologies to provide equivalent grid support
Role in renewable integration	Supports higher renewable penetration by providing firm capacity	Relies on firm capacity elsewhere in the system to maintain reliability
Storage requirements	Not required for basic operability or firmness	Essential to achieve firmness and dispatchability
Hybridisation complexity	Can operate as a standalone firm generation facility	Requires multi-component system integration

SCREENING CRITERION	NUCLEAR (PROPOSED DEVELOPMENT)	RENEWABLES-LED PORTFOLIO WITH FIRING
Typical asset lifetime	Long operational life (several decades)	Shorter asset lifetimes requiring replacement or repowering
Infrastructure footprint	Concentrated footprint at limited sites	Larger cumulative footprint across multiple sites and networks
System-level cost considerations	Higher upfront capital costs; lower reliance on balancing infrastructure	Lower generation costs but higher system and integration costs
Fuel and supply security	Requires nuclear fuel supply and spent fuel management	No fuel for generation; firing resources may require fuel
Waste considerations	Requires radioactive waste and spent fuel management	No radioactive waste; conventional decommissioning requirements
Deployment timeframe	Longer lead times due to licensing and construction	Shorter deployment for individual assets; longer for full firm portfolios
Overall screening conclusion	Directly meets firm, dispatchable service requirements	Functionally comparable only as a firmed portfolio

Where renewable energy is required to provide a service comparable to baseload or firm generation, this is achieved through the integration of additional infrastructure, such as short- and long-duration energy storage, flexible dispatchable generation, demand-side measures, geographic diversification, and grid reinforcement. In such cases, it is the combined system, rather than the renewable generation component alone, that provides firm or baseload-type services.

Renewable-led portfolio with firing is not a single project, but comprises multiple generation assets, storage facilities, transmission reinforcements, and operational assumptions distributed across wide geographic areas, and such portfolios do not have a discrete footprint, construction programme, or operational envelope that can be meaningfully assessed within a project-level EIA.

6.4.5 APPROACHES TO POWER GENERATION

Power generation can be organised in different ways: centralised systems rely on large plants feeding national grids, dispersed systems distribute smaller generation units closer to consumers, and islanding allows parts of the grid to operate independently during outages. Each option has distinct implications for reliability, efficiency, and resilience.

6.4.5.1 Centralised Power Generation^{189,155,152}

Electricity is produced at large facilities (coal, nuclear, hydro, or gas plants) and transmitted over long distances to consumers. This model benefits from economies of scale and stable baseload supply but is vulnerable to transmission losses and large-scale outages. Centralised generation puts

¹⁵² R&D World (2025). Centralized vs Distributed Power Systems: Pros and Cons. Available at: https://eureka.patsnap.com/article/centralized-vs-distributed-power-systems-pros-and-cons?utm_source=copilot.com.

all or large parts of the network at risk as there is no ability to isolate localised networks with their own generation, making it susceptible to massive, single points of failure, which can lead to widespread outages if an issue occurs.

Advantages associated with long transmission networks include:

- Economies of scale: Large plants (coal, nuclear, hydro, or gas) can generate electricity more cost-effectively per unit than smaller systems.
- Stable baseload supply: Centralised plants provide continuous, reliable electricity to meet national demand.
- Established infrastructure: Transmission and distribution networks are already built around centralised generation, making integration straightforward.
- High efficiency at scale: Modern centralised plants, especially combined-cycle gas or nuclear, can achieve high efficiency levels.
- Grid management: Easier to control and coordinate electricity supply from a few large sources compared to thousands of small units.

Disadvantages associated with long transmission networks include:

- High technical system losses – provided by coal fired power stations.
- Significant impact to the environment due to:
 - The technical system losses – coal production and coal fired power stations emit GHG including CO₂.
 - Servitude requirements – one 765 kV line requires servitude of 80 m in width. This means that one line takes up roughly 11 200 hectares of land.
 - The servitude requirements increase with the number of transmission lines required to service a remote area.
- Quality of supply challenges such as voltage instability and harmonics. This makes the system vulnerable during outage times. This can lead to redundancy that leads to environmental impacts as stated above.
- Centralised generation – limited islanding ability. During significant system disturbances it is sometimes desirable to “island” a part of the network from the remainder of the system. Centralised systems are more vulnerable to a “black-out” situation. In the case of a blackout, restoration time is longer for networks that do not have significant local generation.

6.4.5.2 Dispersed Power Generation^{153,154}

Smaller generation units (such as solar PV, wind turbines, or micro-hydro) are located close to end-users. This reduces transmission losses, increases resilience, and supports renewable integration. Distributed generation aims to improve reliability and efficiency by locating power closer to the user.

¹⁵³ Department of Energy (2025). Advantages and Disadvantages of Distributed Generation Technology. Energy Sustainability Journal. Available at: https://welly.it.com/what-are-the-advantages-and-disadvantages-of-distributed-generation?utm_source=copilot.com.

¹⁵⁴ Flux Energy (2025). Advantages and Disadvantages of Distributed Energy Generation. Available at: https://fluxfair.nyc/advantages-and-disadvantages-of-distributed-energy-generation/?utm_source=copilot.com.

However, dispersed systems require advanced grid management and can be more costly per unit of energy.

Advantages associated with dispersed generation include:

- Reduced system losses.
- Reduced environmental impacts due to reduced carbon emissions (reduced technical losses).
- Reduced environmental impacts due to transmission servitude requirements.
- Improvement in quality of supply in the remote load centres.
- Improved islanding ability and restoration times for the local areas.

Disadvantages associated with dispersed generation include:

- High upfront costs: Installation of small-scale renewable systems (solar panels, wind turbines, microgrids) can be expensive.
- Grid integration challenges: Managing multiple small sources requires advanced grid infrastructure and smart technologies.
- Variable output: Renewable-based dispersed systems depend on weather and local conditions, which can affect reliability.
- Maintenance complexity: Numerous small systems may require more frequent monitoring and technical expertise.
- Limited economies of scale: Per-unit generation costs are often higher than large, centralised plants.

6.4.5.3 Islanding^{189,154,155}

Islanding allows a part of the network to remain stable and able to supply the local load while other parts of the network are being restored. While islanding is a condition where a part of the grid with distributed generation disconnects from the main grid but continues to operate independently, a dangerous situation for utility workers. Uncontrolled islanding can cause serious safety hazards and complicate grid restoration. Therefore, anti-islanding mechanisms are vital for safely integrating distributed energy resources.

Advantages associated with islanding generation include:

- Resilience: Ensures continuity of supply during grid outages, especially for critical facilities like hospitals, data centres, or military bases.
- Energy independence: Communities or businesses can operate autonomously, reducing reliance on centralised grids.
- Supports renewables: Islanding allows local renewable energy sources to continue functioning even when the wider grid is down.
- Improved reliability: Enhances grid stability by reducing the impact of faults on the wider system.
- Flexibility: Can be applied to rural or remote areas where grid connection is weak or unavailable.

Disadvantages associated with islanding generation include:

- Complex grid management: Requires sophisticated control systems to detect faults and safely disconnect/reconnect to the main grid.
- High costs: Investment in smart inverters, control systems, and storage technologies can be expensive.

- Safety concerns: Poorly managed islanding can pose risks to utility workers and equipment if power flows unexpectedly during outages.
- Limited scale: Islanding is typically suitable for small communities or facilities, not large-scale national supply.
- Variable output: If reliant on renewables, islanded systems may struggle to meet demand without adequate storage.

6.4.5.4 Comparing Power Generation Options

Table 6-9 provides a comparison between the power generation options discussed above.

Table 6-9 – Comparison between Power Generation Options¹⁵⁵

Aspect	Centralised Generation	Dispersed Generation	Islanding
Scale	Large plants (MW to GW)	Small units (kW to MW)	Localised microgrids
Reliability	Stable baseload, but vulnerable to grid failures	Flexible, resilient, but variable output	Maintains supply during grid outages
Efficiency	Economies of scale, but transmission losses	Reduced losses, closer to consumers	Depends on local generation capacity
Environmental Impact	Often fossil-fuel based, higher emissions	Supports renewables, lower emissions	Depends on generation mix
Cost	High upfront investment, lower unit costs	Higher per-unit costs, but scalable	Requires advanced grid management systems

Centralised power generation is identified as the preferred alternative. The NPP is intended to deliver large-scale, firm and dispatchable electricity over a long operational life, a requirement that is inherently aligned with a centralised generation model. While dispersed generation and islanded systems play an important complementary role in supporting renewable integration and local resilience, they are not capable, in isolation, of meeting the system adequacy, stability and bulk power delivery objectives underpinning the proposed project. Centralised generation enables economies of scale, high availability, synchronous grid support and effective integration with existing and planned transmission infrastructure.

6.4.6 DESIGN ALTERNATIVES

6.4.6.1 Footprint Alternatives

Alternative buildable footprints will be identified during the EIA phase for the preferred site, with consideration of the sensitivity mapping. Figure 6-13 and Figure 6-14 illustrate preliminary site 'envelope' layouts of the NPP footprint for Thyspunt and Bantamsklip respectively.

¹⁵⁵ IEEE Xplore (2025). Concerns Generated by Islanding in Distributed Generation Systems. Available at: https://ieeexplore.ieee.org/document/1293600?utm_source=copilot.com.

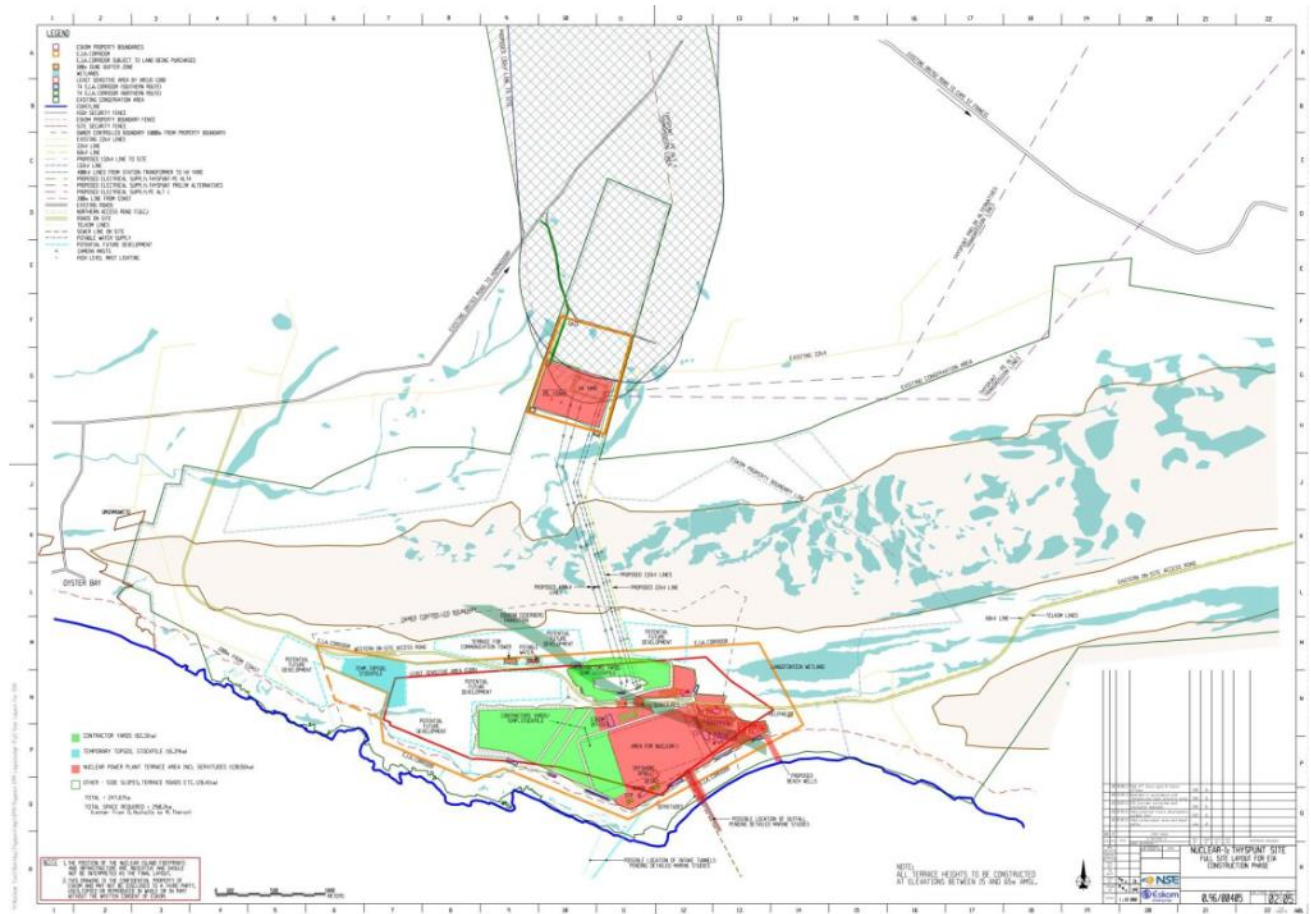


Figure 6-13 – Preliminary Site footprint for Thyspunt



Figure 6-14 – Preliminary Site footprint for Bantamsklip

6.4.6.2 Cooling Alternatives¹⁵⁶

Cooling water is required to remove “waste heat” from power stations regardless of whether the stations are nuclear or conventional. A NPP has a typical thermal-to-electrical efficiency of between 33% to 50%^{157,158,159}, depending on the reactor type (compared to around 40% for a modern coal-fired station) and hence a 1 000 MWe NPP would typically generate up to 2 000 MW of low-grade waste heat. This section explores cooling water options for new reactors and evaluates their potential environmental impacts in terms of effects on biota, and thermal, chemical and radionuclide

¹⁵⁶ Environment Agency. (2010). Cooling Water Options for the New Generation of Nuclear Power Stations in the UK, SC070015/SR3. Better Regulation Programme, Evidence Directorate.

¹⁵⁷ Eureka. (2026). Analyzing Energy Efficiency in Pressurized Water Reactors. Available: <https://eureka.patsnap.com/report-analyzing-energy-efficiency-in-pressurized-water-reactors>.

¹⁵⁸ Esam M.A. Hussein. (2020). Emerging small modular nuclear power reactors: A critical review. Physics Open, 5, 100038. Available: <https://www.sciencedirect.com/science/article/pii/S2666032620300259#:~:text=4.4.&text=In%20case%20of%20failure%20of,reactor%20is%201620%E2%88%98C>.

¹⁵⁹ Nøland, J.K. (n.d.). Overview of Small Modular and Advanced Nuclear Reactors and Their Role in the Energy Transition. DOI 10.1109/TEC.2025.3529616. Available: <https://www.diva-portal.org/smash/get/diva2:1944371/FULLTEXT01.pdf>.

pollution. The findings are focused on, but not confined to, NPPs and have general applicability to other large (above 1 000 MWe) thermal power station projects as well.

The need for cooling at power stations

Improving overall plant efficiency is closely linked to how heat is rejected from the system and includes considerations such as theoretical efficiency limits, the use of superheating, reheating and regenerative heating, the relationship between efficiency and plant size, and the application of supercritical operating conditions. These principles apply to both conventional coal-fired power plants and nuclear thermal cycles.

A critical component in this process is the condenser, which plays a central role in removing waste heat and maintaining the efficiency of the steam cycle. The principles of cooling are therefore central to power station design and operation, and a range of cooling technologies may be applied.

Cooling system options include:

- Direct (once-through) wet cooling systems
- Indirect (recirculating) wet cooling systems
- Natural draft cooling towers
- Mechanical draft cooling towers
- Dry cooling systems and air-cooled condensers
- Hybrid cooling systems (combination of dry and wet cooling)

In addition to technical performance, the selection of a cooling system is influenced by economic consideration.

For the proposed NPP, two types of cooling alternatives have been considered as discussed below:

Once-Through Cooling (Direct Cooling)

Large volumes of water are withdrawn from the ocean. The water passes through condensers to absorb waste heat from the steam cycle. It is then discharged back into the ocean at a higher temperature.

Key characteristics of the once-through cooling system is that there is no cooling towers associated with this system. In terms of water use, it has extremely high withdrawal rates, but most of the water is returned (not consumed). Because the water is cool and abundant, this system has very efficient heat transfer. Regarding the potential environmental impact, it can cause thermal pollution (raising water temperatures), harm aquatic life (entrainment/impingement of fish and organisms), and alter ecosystems.

The process flow of the once-through cooling system is depicted in Figure 6-15.

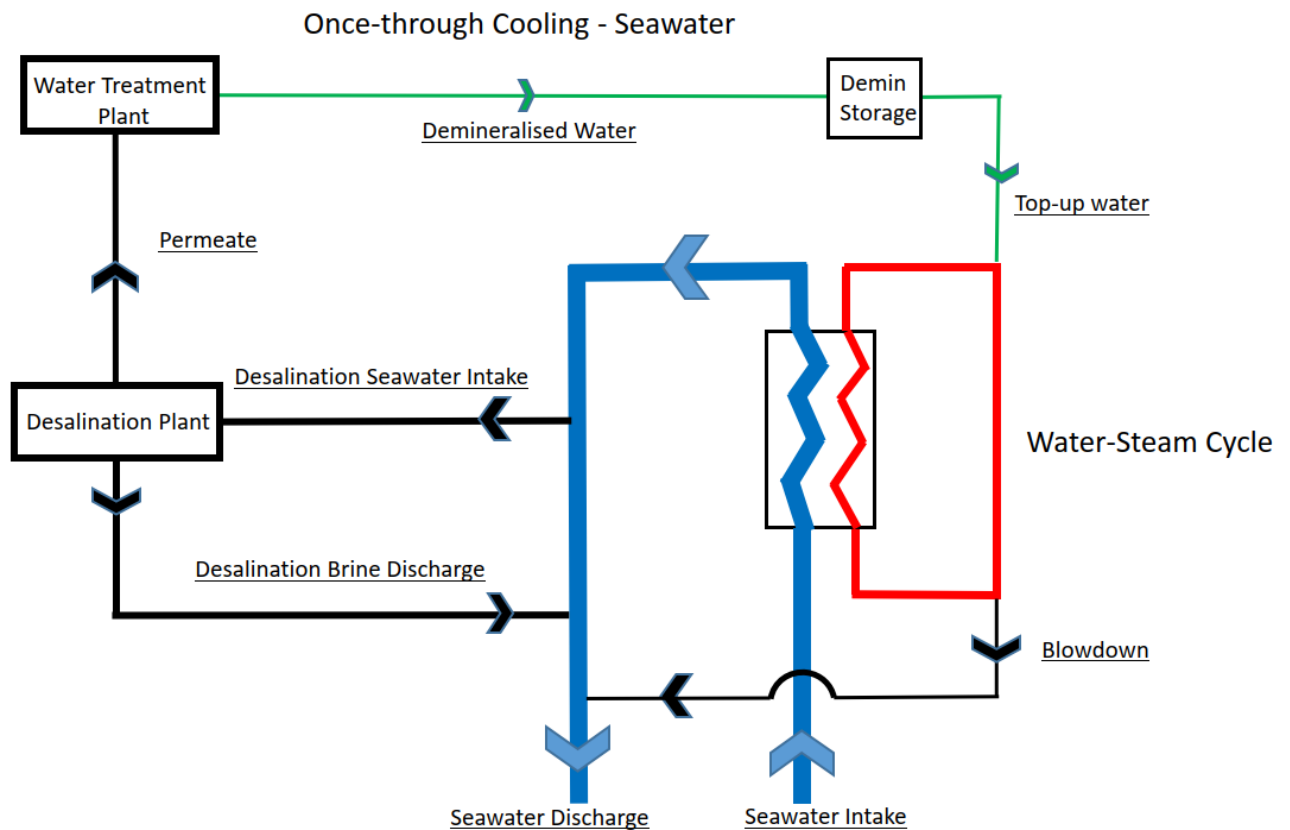


Figure 6-15 – Once-Through Cooling Process Flow (As integrated with other intake/discharge requirements)

The Marine Physical, Water Quality, Sediment Transport and Shoreline Change Scoping Study undertaken by WSP Africa, dated March 2026, highlighted that the impact assessment for Nuclear-1 (Gibb, 2016; Giljam, 2011) assumed the project stages and durations (of relevance to defining once-through cooling operations) as indicated in Table 6-10.

Table 6-10 – Project stages and their likely durations (Eskom, 2013, 2024, 2025a)

TECHNOLOGY	PROJECT STAGE	5 200 MWE
Once-through cooling	Construction ¹⁶⁰	6 years
	Commissioning	3 years
	Operations	80 years
	Decommissioning	20 years

¹⁶⁰ This includes a site establishment stage that could last between 2 to 2.5 years.

Evaporative Cooling (Recirculating Cooling)

Water circulates through the condenser to absorb heat. Instead of being discharged, it is sent to a cooling tower. In the tower, some water evaporates, carrying away heat into the atmosphere. The cooled water is collected and recirculated back into the system.

Key characteristics of the evaporative cooling system is that there is a cooling tower present. In terms of water use, it has a lower withdrawal rate than once-through, but a higher consumption rate because water is lost to evaporation and drift. This system is slightly less efficient than once-through cooling because the cooling tower water is warmer than natural sources. Regarding the potential environmental impact, this system reduces thermal pollution to the ocean but consumes water and requires chemical treatment to control scaling, corrosion, and biological growth. However, this system is more flexible as it can be used in areas without large water bodies, making it more adaptable for inland plants.

The process flow of the evaporative cooling system is depicted in Figure 6-16.

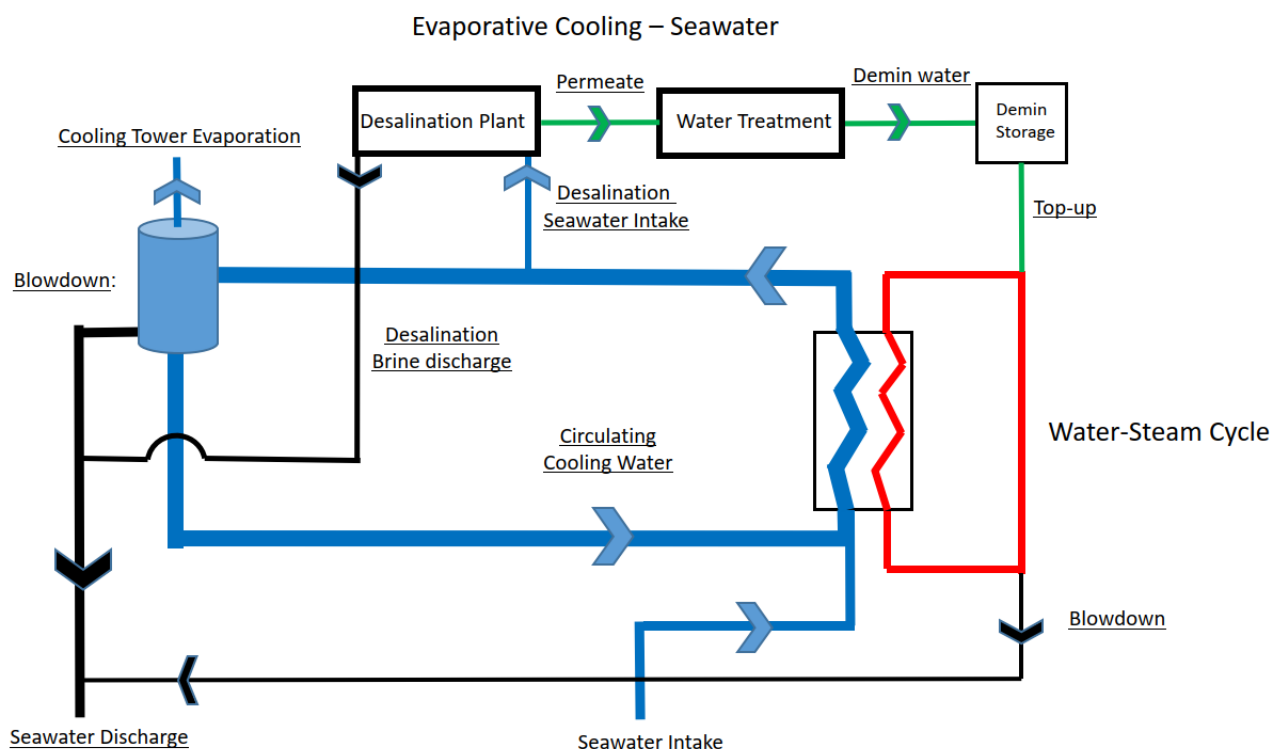


Figure 6-16 – Evaporative Cooling Process Flow

There are three different cooling tower options available for the evaporate cooling system. These are natural draft (wet), mechanical draft (wet), natural draft (dry) or hybrid towers a combination of wet and dry.

A summary of impacts from the various cooling is summarised in Table 6-11.

Table 6-11 – Comparison of cooling options

Environmental Concern	Direct Cooling	Evaporative Cooling (Recirculating Cooling)		
		Natural draft (wet)	Mechanical draft (wet)	Natural draft (dry)
Generation efficiency	High efficiency. Uses less fuel so lower aerial emissions	Typically 0.5 – 1.5% less efficient than direct cooling	Typically ~2% less efficient than direct cooling	Lowest efficiency 2 – 3% less efficient than direct cooling
Complexity	Low	Moderate	High	Very high
Water abstraction	High	Moderate/low	Moderate/low	None
Abstraction effects	Site-specific – dependent on characteristics of receiving waters.			
Water consumption	None on-site	Moderate	Moderate	None
Visible plumes	None	Moderate	Moderate/low	None
Ground fog and icing	No icing. Local fog plume over shoreline discharges	None	Possible	None
Visual impact	Occasional foam or 'slick' at outfall	High	Moderate	High
Noise	None	Low	Moderate	Low/none
Thermal effects	Discharge residual heat directly to the marine environment.	Most waste heat is discharged to the atmosphere, substantially reducing direct thermal impacts on the ocean		
Waste disposal to landfill ¹⁶¹	None if using fish recovery and return	Moderate	Moderate	Moderate/none
Land use on-site ¹⁶²	None/low	Moderate/high	Moderate	High

Cooling towers introduce significant capital and operating costs, reduce plant efficiency, and consume scarce water resources.

Given that the sites have access to a large, reliable water body, a once-through cooling system offers superior thermodynamic performance, lower costs, and reduced water consumption, it has been selected as the preferred option. However, the thermal effects through discharge of residual heat and the large seawater intake and discharge requirements are key potential disadvantages that will require extensive investigation during the EIA phase, including the various cooling water intake and discharge options (also refer discussion in Section 6.4.6.3).

¹⁶¹ Wastes from wet towers are mainly silt (non-hazardous); from dry towers, glycol (non-hazardous), if used.

¹⁶² This covers buildings and structures only and does not include spray ponds or cooling canals.

6.4.6.3 Cooling Water Intake and Discharge Options¹⁶³

The PPE approach requires a similar approach to assessing the nature of the marine infrastructure associated with once-through cooling. Consequently, the worst-case option of marine infrastructure required to support the once-through cooling option needs to be assessed. Given the complexity of potential impacts associated with the various infrastructure options (e.g., the disruption of nearshore sediment transport regimes by stilling basins) it becomes necessary to consider all intake and discharge infrastructure options for both the Bantamsklip and Thyspunt sites, even though assessments to date suggest that:

- The marine infrastructure at the Thyspunt site is likely to only require intake of and discharge of cooling waters via a tunnel system with a possibility of a channel discharge if deemed preferable (Giljam, 2011; Eskom, 2025a); and
- The intake and discharge infrastructure for Bantamsklip has considered both tunnel infrastructure as well as various options for stilling basin for intake waters and discharge channels (raceways) for the discharge of cooling waters (Giljam, 2011; Eskom, 2013).

In the Nuclear-1 assessments, the following infrastructure was considered for the intake and discharge of cooling waters:

- A stilling basin for the intake of seawater for once-through cooling or the alternative of intake tunnels;
- A raceway for cooling water discharges or the alternative of discharge via outfall tunnel(s) and associated diffuser structures.

In the Nuclear-1 EIA specialist assessments by Giljam (2011) only intake and discharge tunnels were considered for the Thyspunt site, while a wider combination of intake and discharge infrastructure was considered for the Bantamsklip site. It is not immediately obvious why this should be the case other than that the nearshore bathymetry at Thyspunt is better suited to shorter tunnels than is the case at Bantamsklip, resulting in only tunnel options being considered in the Thyspunt SSR (informed by PRDW, 2009 e,f) available at that time and used to inform the Nuclear-1 EIA (Gilham, 2011, Griffiths et al., 2016, Gibb, 2016).

As noted above, the once-through cooling water marine infrastructure options considered in the latest SSR (Eskom, 2013, 2025a) used to inform the present study, remain largely unchanged other than for the SSR for the Thyspunt site (ESKOM, 2025a) where a shoreline channel discharge option is assessed rather than a tunnel outfall option.

Each power generation unit of 1 650 MWe is assumed to have associated with it an approximate once-through cooling water flow requirement of 76 m³/s (Eskom, 2013, 2025b,c). The resultant once-through cooling water flow rates for various NPP installed capacities are reported in Table 6-12.

However, in the most recent Thyspunt SSR (2025a) that is based on the PPE given in Eskom (2024), it is stated that the approximate once-through cooling water flow requirement of 76 m³/s is

¹⁶³ WSP Group Africa. (March 2026). Thyspunt and Bantamsklip Nuclear Project Environmental and Social Impact Assessment. Marine Physical, Water Quality, Sediment Quality and Shoreline Change Scoping Report.

associated with a slightly larger power generation unit of 1 650 MWe. This results in slightly lower once-through cooling water flows requirements, i.e., the lower estimates of once-through cooling water flows rates reported in Table 6-12.

The temperature rise (ΔT) between the intake and discharge waters is $\Delta T = 12^\circ\text{C}$ and any re-circulation of cooling waters at the intake should not elevate intake water temperature more than 1.5°C above ambient seawater temperatures (i.e., the temperature elevation at the intake due to entrainment of cooling water effluents should not exceed $\Delta T = +1.5^\circ\text{C}$ at the intake).

The thermal effluent will contain a total residual oxidant (TRO) concentration (typically measured as mg/L CL₂). The TRO concentrations will be minimised by using an appropriate dosing regime (e.g., intermittent as opposed to continuous dosing). The TRO residuals will be confirmed and included in the detailed specialist impact assessment to be undertaken for the preferred site in the EIA Phase.

Once the desalination plant has been fully commissioned, the brine effluents (including co-discharges) will be released into the once-through cooling water effluent stream. However, given the modest brine discharge flows relative to the large volume once-through cooling water flows, this will not result in a material change in the water quality of the cooling water releases.

Table 6-12 – Once-through intake and discharge flow rates and effluent characteristics (Eskom, 2013, 2025a)

TECHNOLOGY	PROJECT STAGE	5 200 MWE
Once-through cooling	Construction ¹⁶⁴	n/a
	Commissioning	n/a
	Operations	Flow = 230 ¹⁶⁴ to 240 ¹⁶⁵ m ³ /s; $\Delta T = 12^\circ\text{C}$ & a biocide (TRO) residual
	De-commissioning	n/a

In principle, a range of intake and discharge infrastructure is possible including several potential combinations of intake (stilling) basins, discharge channels (raceways) and tunnel intake and outfall infrastructure. A range of layout options have been defined in the SSR (Eskom, 2013), however the most recent SSR (Eskom, 2025) for Thyspunt addresses only tunnel intakes and the option of a discharge channel. As noted earlier, the focus on tunnel intakes at Thyspunt presumably is due to the bathymetry at Thyspunt where deeper waters occur closer inshore resulting in shorter and less costly intake (and outfall) tunnels. These intake and discharge options will be assessed in detail in the EIA phase for the preferred site.

An indicative range of intake and discharge infrastructure that could be considered for both sites is as in Figure 6-17.

¹⁶⁴ Based on a required once-through cooling water flow rate of 76 m³/s per 1 708 MWe of installed NPP capacity (ESKOM, 2024, 2025a).

¹⁶⁵ Based on a required once-through cooling water flow rate of 76 m³/s per 1 708 MWe of installed NPP capacity ESKOM (2013, 2025b).

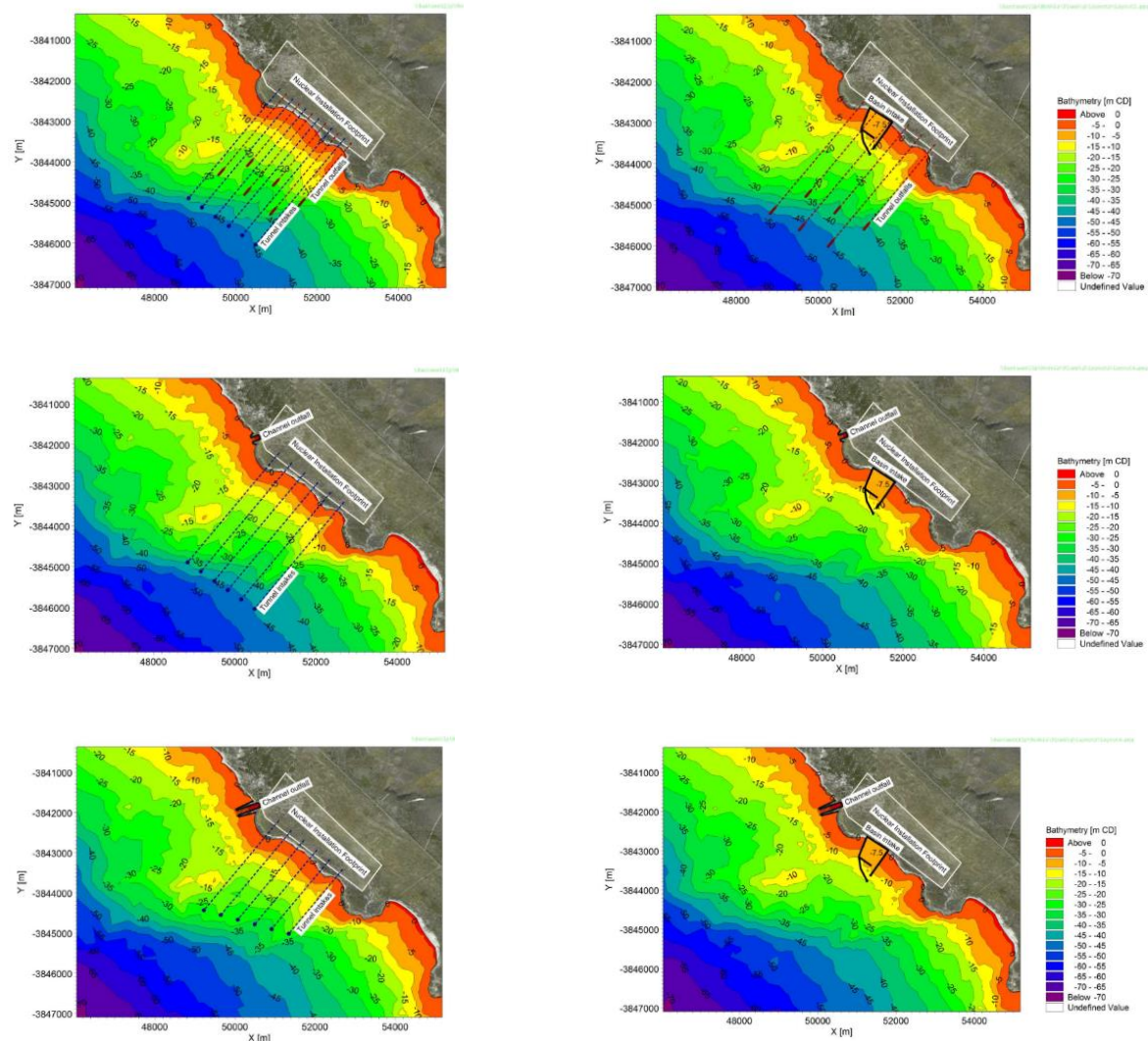


Figure 6-17 – Indicative range of intake and discharge infrastructure options available for the selected sites (presented here for the Bantamsklip site) Source: Eskom (2013)

6.4.6.4 Dredging Activities, Excavation and associated Spoil Disposal¹⁶³

There are several sources of potential material needing disposal. The most major source is that from the excavation of a terrace area to accommodate components of the NPP. Additional sources of material needing disposal could include the excavations associated with the development on intake (stilling) basin, the intake and outfall tunnels and other excavation around the site (e.g., the development of the coffer dam).

By far the largest source of material needing disposal is that from the preparation of the terrace to accommodate the various components of the NPP. Earthworks will involve the removal of the overburden sands down to bedrock level, which differs between the two sites. The same process will be applied to other terraces, which support ancillary buildings. The NPP buildings will need to be founded on either bedrock or engineered fill, neither of which should be susceptible to large deformations during and following strong motion earthquakes.

The volumes needing to be disposed of are approximately 10.1 million m³ for the Bantamsklip site and significantly less at 6.5 million m³ for the Thyspunt site. These estimates include material generated from an intake tunnel system assumed to be 1 000 m in length at both sites, namely 37 285 m³. It is not clear whether material from the outfall system and/or any intake basin or discharge channels (raceways) are included. However, such additional quantities are very small compared to those generated from the preparation of the terrace.

Alternative 1: On-Beach Placement (Beach Nourishment / Direct Beach Disposal)

This alternative entails the placement of suitable excavated or dredged material directly onto adjacent beaches, potentially as a form of beach nourishment. While it may contribute to erosion mitigation where sediment characteristics are compatible with native beach material, this option carries higher risks of altering beach morphology, sediment transport processes and shoreline stability if material is incompatible or placed in excessive volumes. This alternative for the preferred site will be further assessed during the EIA phase through detailed sediment characterisation, coastal process modelling, ecological assessment and cumulative impact evaluation.

Alternative 2: Nearshore Placement (Shallow Subtidal Disposal)

Nearshore placement involves disposal of spoil material in shallow water within or adjacent to the active coastal sediment system. This alternative is associated with risks related to sediment re-mobilisation, bathymetric modification and indirect shoreline impacts. Further EIA-level assessment for the preferred site will include site-specific sediment transport modelling, plume dispersion assessment, benthic habitat sensitivity analysis and evaluation of operational controls.

Alternative 3: Offshore Disposal (Deep-Water Disposal)

Offshore disposal entails placement of dredged and excavated material at deeper offshore locations outside the active nearshore zone. This is the preferred alternative at scoping level. The EIA phase for the preferred site will include disposal site selection studies, sediment fate and transport modelling, turbidity plume assessment, benthic ecological surveys and definition of monitoring and mitigation requirements.

Alternative 4: Beneficial Use of Spoil Material

The beneficial reuse of spoil material, particularly for beach nourishment, has been identified as a potential alternative but is not advanced as a preferred option at scoping level due to uncertainties related to sediment compatibility, placement volumes and cumulative impacts. Further consideration during the EIA for the preferred site will assess feasibility, sediment budgets, longshore transport rates and interactions with existing authorised coastal interventions.

Alternative 5: Cut and Fill Techniques¹⁶⁶

This alternative focuses on optimising earthworks by balancing excavation (cut) and embankment (fill) within the project site, thereby significantly reducing the volume of excess spoil material. Reducing the excess spoil material from 6.37 million m³ to 478 942 m³ through cut and fill

¹⁶⁶ Additional alternative added in response to stakeholder concerns regarding spoil disposal

techniques. The objective is to reuse material on-site, minimising the need for hauling and disposal. The remaining 478,942 m³ is not considered waste but a useful resource, it will be utilised in the development of the High Voltage (HV) yard. This may include raising platform levels, forming embankments, or improving ground conditions. Further consideration during the EIA for the preferred site will assess feasibility of the cut and fill, the exact calculations, how much spoil will be available and how much may be available for reuse.

Preferred Alternative at Scoping Level

At the scoping stage, offshore disposal is identified as the preferred spoil disposal alternative, subject to confirmation through detailed EIA studies for the preferred site. Other alternatives remain feasible but are associated with higher environmental risk and complexity.

Further Assessment during the EIA Phase

The EIA will include for the preferred site detailed sediment characterisation, numerical modelling of sediment transport and plume dispersion, marine ecological assessments, shoreline stability analysis, cumulative impact assessment and development of mitigation, monitoring and adaptive management measures.

6.4.6.5 Freshwater Supply¹⁶⁷

The assessment of water supply options as undertaken by the freshwater supply specialist for the proposed NPP has considered conventional freshwater sources and seawater desalination in the context of supply reliability, environmental constraints, and long-term operational assurance at the Thyspunt and Bantamsklip sites. At a scoping level, the evaluation focuses on the feasibility and strategic suitability of each option rather than detailed design.

At Thyspunt, limited quantities of groundwater from the Algoa and Table Mountain Group aquifers are available and are considered sufficient to meet short-term site establishment requirements of approximately 70.72 L/s, including under dry climatic conditions, subject to coordination with the Kouga Local Municipality and sustainable abstraction controls. However, beyond this initial phase, groundwater resources and existing municipal supply schemes cannot reliably meet construction peak or long-term operational demands without posing unacceptable risks related to aquifer depletion, drought vulnerability, and regional water supply priorities.

At Bantamsklip, groundwater potential is generally low and existing municipal and community water supply schemes are small, spatially dispersed, and intended to meet local domestic needs only. Previous investigations indicate that any large-scale industrial water demand at this site would require importation of water from distant regional schemes, which is not considered feasible within the required project timeframes or with sufficient assurance of supply. As such, conventional freshwater sources at Bantamsklip are not regarded as a viable option even during early project phases.

Across both sites, alternative freshwater options that including construction of new dams, treated wastewater reuse, stormwater harvesting, or acquisition of existing water use licences were

¹⁶⁷ SRK Consulting. (February 2026). S&EIR for Eskom's Proposed New Nuclear Sites: Scoping Report Specialist Water Supply Study.

evaluated and screened out at scoping level. These options are constrained by limited available yield, long development lead times, regulatory complexity, and competing regional water demands, particularly under conditions of recurring drought and climate variability. Consequently, none of these sources can provide the level of reliability required for a nuclear installation.

In contrast, seawater desalination offers a consistent and climate-resilient water source at both coastal sites. The availability of seawater, combined with proven reverse-osmosis technology and the ability to phase desalination infrastructure in line with project development, provides the highest assurance of supply for both construction and operational requirements. Desalination is therefore identified as the preferred long-term water supply option for Thyspunt and Bantamsklip at scoping level.

Potential environmental effects associated with desalination, notably brine discharge to the marine environment, have been identified as the primary sensitivity. These effects are largely limited to the construction phase and are expected to be localised and manageable through offshore discharge beyond the surf zone and, during operation, blending with the large volumes of NPP cooling water, resulting in discharge salinity close to ambient seawater levels. Detailed assessment of marine impacts and discharge design will be undertaken during the EIA phase for the preferred site.

In summary, while limited groundwater abstraction at Thyspunt may support short-term site establishment, seawater desalination represents the only technically feasible and secure water supply option capable of meeting the full lifecycle demands of the proposed NPP at both Thyspunt and Bantamsklip.

6.4.6.6 Brine disposal from Desalination Facilities¹⁶³

It is proposed that Seawater Reverse Osmosis (SWRO) desalination will be used to provide freshwater during both the construction and operational stages of the power station. The alternatives considered are the means for the associated brine disposal.

Three discharge options for the brine discharge were considered for the construction stage in the Nuclear-1 EIA, namely:

- discharging the brine through a pipe located on the upper beach profile;
- from a pipe located in the surf-zone at a depth of -5m MSL, or
- from a pipe located beyond the surf-zone at a depth of -10m MSL (roughly 500 m offshore but varying between the sites).

These options will be assessed in more detail in the EIA phase for the preferred site.

6.4.7 NO-GO ALTERNATIVE^{109,120}

This alternative entails not undertaking the proposed activity or any of its alternatives. The no-go alternative also provides the baseline against which the impacts of other alternatives should be compared.

The principle of the no-go alternative is that the benefits of the proposed activity will not be realised with the status quo remaining and neither will the associated negative impacts or risks. In terms of the benefits of the proposed activity, these centre principally around the provision of sustainable, reliable and affordable baseload power within the overall energy supply mix needed for South Africa. Other benefits that emanate from the proposed project are:

- The reduction of coal fired contributions to power generation that would be in line with Eskom's long-term strategy to diversify its primary energy requirements, and reduce GHG emissions;
- Reduction in transmission line losses; and
- It should further be noted that should Eskom not utilise the sites for nuclear development, it is likely that the properties will be sold, pending a decision by the Eskom Board. The sale of the properties will be to a willing buyer at a market-related price, which would probably result in an alternative form of land use that may have environmental impacts of its own.

It is not suggested that the current (no-go) situation is without negative impacts of its own. According to the scoping phase specialist studies, there are significant current sources of environmental degradation around the sites that would be likely to continue.

Based on the increasing electricity demands associated with increased economic growth in South Africa, the no-go (no development) alternative is not considered to be a feasible alternative to the development of the NPP. Eskom must provide additional large-scale baseload power stations, either through nuclear power or through the development of additional coal fired power stations.

However, the no-go alternative will be considered in the EIA phase as a baseline against which the impacts of the proposed project will be assessed. The no-go alternative will be discussed in more detail during the EIA Phase.

The no-go considerations from the scoping phase specialist reports, where relevant are provided below. The no-go option will be considered in greater detail in the EIA phase.

6.4.7.1 Air Quality

There are no sensitive features on site and any no-go areas from an air quality perspective near both the Bantamsklip and Thyspunt sites.

6.4.7.2 Geotechnical

If the proposed project does not proceed, it is expected that the proposed sites will be undisturbed. Consequently, the condition and character of on-site natural habitat will likely remain unchanged.

6.4.7.3 Fauna and Invertebrates

For both sites, there is an Endangered Wildlife Trust (EWT) no-go area that the road area overlaps with for a plant species.

The report further highlights a mitigation measure that states "areas other than the footprint areas and existing surface infrastructure areas, should be declared as 'no-go' areas to vehicles (only). All essential operational staff – machinery must be limited to development area (no need to go outside the authorised area)".

6.4.7.4 Flora

Restricting development to the smallest feasible footprint and avoiding sensitive habitats such as wetlands, freshwater seeps, mobile dunes, dense thicket and dune forest. Maintain ecological corridors and buffers, particularly coastal–inland linkages, to preserve habitat connectivity and ecological function. Rehabilitate temporarily disturbed areas using locally indigenous species.

6.4.7.5 Terrestrial¹⁶⁸

For the Thyspunt site, it is located between St Francis Bay / Cape St Francis and Oyster Bay. Although Rebelsrus is a nature reserve, it is privately owned and the entire coastline within this reserve contains evenly spaced high-value coastal houses. The declaration of a private nature reserve therefore does not exclude limited development and associated impacts. The Eskom property contains several houses that are now either abandoned or are being used for other purposes. There is clearly a strong pressure to extend coastal development into the current site, and the site would have high value for this, in the event that it was sold. Historical aerial photographs show that there was no development south of the Krom River in 1961, which means the entire St Francis Bay / Cape St Francis node has been developed in around 65 years. Given another 50 years, it is conceivable that strip development along the coast could connect Cape St Francis and Oyster Bay, unless strong environmental protection is implemented. Creeping environmental development in coastal areas has occurred in the same way in other parts of the country, for example in the Garden Route and in Hermanus, and is a likely scenario at the current site.

In the absence of development, invasion by alien invasive shrubs has been a feature of large parts of South Africa over the last 30 years. The reasons are multi-fold, but partly due to lack of management and of enforcement. Where there is no incentive to manage alien species, these have spread to dominate landscapes, and eventually completely exclude indigenous vegetation. Coastal areas are especially susceptible to this trend. In the absence of development, or possibly in combination with development, this is a likely scenario in the study area.

For the Bantamsklip site, there is much less development pressure due to the more isolated location. However, the risk from alien invasive plant species is essentially the same, possibly worse due to existing invasions in surrounding coastal areas.

In terms of the development pressure and impacts due to alien invasive species in the event that no development takes place and limited controls are put in place to prevent these impacts, the impacts are expected to be high prior to mitigation and low post-mitigation. The mitigation is assumed to be tighter control on future development, as well as rigorous control of alien invasive plant species.

6.4.7.6 Aquatic Ecosystems

No-go areas for development on either site comprise all watercourses and their stipulated buffer areas. No-go activities would be any that could result in draw-down or other impacts to these watercourses – in the case of the Thyspunt site, it is recognised that the proposed NPP would indeed result in impacts to some of the coastal seeps and such impacts would require ecological compensation / offsetting.

For the Bantamsklip site, establishment of the area north of the R43 as a no-go area for all NPP-associated activities, other than alien plant clearing and management.

¹⁶⁸ Some assumptions are required in order to make this assessment, for example, whether Eskom would continue to own and manage the properties in the event that development does not occur, or whether they would sell them.

6.4.7.7 Marine Ecology

No marine areas within the Bantamsklip site are currently identified as no-go areas, although mitigation measures and management controls remain necessary to limit further degradation of coastal habitats.

For Thyspunt, the area to the eastern edge of the CBA area Agulhas Stromatolite Mixed Shore (considered Vulnerable), with a small total national area of only 8.45 km². While the site is not delineated Critical Habitat as per IFC criteria, every effort should be made to avoid direct disturbance to these habitats (Conditional Areas) (i.e., the construction footprint to design around these areas of sensitivity), with the habitats of Least Concern Preferred for development.

6.4.7.8 Avifauna

During the breeding season (August to December) cormorant breeding areas are considered no-go areas. Outside of the breeding season, these areas are considered high sensitivity areas.

6.4.7.9 Socio-economic

The principle of the no-go alternative is that the benefits of the proposed activity will not be realised with the status quo remaining, and neither will the associated negative impacts or risks. In terms of the benefits of the proposed activity, these centre principally around the provision of sustainable, reliable and affordable baseload power within the overall energy supply mix needed for South Africa.

6.4.7.10 Visual

The 'no-go' alternative is the option of not undertaking the proposed NPP project. Hence, if the 'no-go' option is implemented, there will be no development. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and has been considered throughout the report.

6.4.7.11 Heritage

For Bantamsklip, the overhead power lines that will connect the station to the nearest grid connection will need to traverse the very highly sensitive and no-go topographical features, such as the scarp and ridgelines, which is unsupportable from a cultural landscape perspective.

For Thyspunt, slopes of 10% up to > 30% are present on the site and would be no-go for large scale development from a cultural landscape perspective. Furthermore, the overhead power lines that will connect the station to the nearest grid connection will need to traverse the very highly sensitive and no-go dune field features.

6.4.7.12 Climate Change

For the purposes of the CCIA, the no-go alternative represents a zero project-emissions baseline, consistent with the project-level approach set out in ISO 14064-2:2019, against which emissions from the proposed project and its alternatives will be assessed during the EIA phase.

6.4.7.13 Radioactive Waste and Transport

Since the study is not site-specific, a site-sensitivity verification assessment (including sensitivity mapping to identify sensitive features and no-go areas) is not applicable.

7 LEGISLATIVE FRAMEWORK

This section of the Scoping Report examines the relevant legal frameworks. It reviews both international agreements and national legislation, regulations, and policies that relate to or impact the proposed nuclear power station in South Africa. A major emphasis is placed on the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), which serves as the foundational legislation governing environmental assessments in South Africa. Given Eskom's plan to construct the necessary infrastructure and generate electricity through nuclear means, the stipulations of NEMA and its associated EIA Regulations (pertaining to Scoping and Environmental Impact Assessments) are especially pertinent.

Beyond NEMA, this section also evaluates other key legislative areas, including those that regulate:

- nuclear installations and their licensing;
- the mining and energy industries;
- national key points; and
- hazardous materials.

Additionally, the section touches on a wide range of other laws tied to constitutional and administrative principles within South African law, as well as specific environmental legislation concerning water resources, biodiversity, coastal areas, and land use planning, such as the National Water Act (Act No. 36 of 1998), the National Environmental Management: Waste Act (Act No. 59 of 2008), the National Environmental Management: Air Quality Act (Act No. 39 of 2004), the National Environmental Management: Biodiversity Act (Act No. 10 of 2004), the National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008) and the National Environmental Management Protected Areas Act (Act No. 57 of 2003) amongst others.

The primary goal of the legal portion of this report is to deliver a clear yet thorough overview of relevant planning, development, environmental, and electricity-related laws that are especially significant for regulating the nuclear energy sector.

Developing a nuclear facility for electricity production requires several discrete authorisations, each to be obtained from different departments across the three levels of government, such as the DFFE, the NNR (referred to here as the "Regulator"), NERSA, DEE, and the DWS. Environmental authorisations, particularly for activities listed under NEMA, are obtained from the DFFE, while water use licenses come from the DWS. If borrow pits need to be created for construction, permits must be sought from the DMPR. Lastly, the Chief Executive Officer of the NNR is responsible for issuing licenses related to the siting, design, construction, operation and decommissioning of nuclear facilities.

7.1 CONSTITUTIONAL AND ADMINISTRATIVE FRAMEWORK

The applicable constitutional and administrative legal dispensation is outlined in Table 7-1.

Table 7-1 – Applicable Constitutional and Administrative Legal Dispensation

Legislation	Description of Legislation	Applicability to NPP
The Constitution of South Africa (Act No. 108 of 1996)	The Constitution underpins the international principle that everyone has the right to an environment that is not harmful	While no permitting or licensing requirements arise directly, this paves the way

Legislation	Description of Legislation	Applicability to NPP
	to their health or well-being. This fundamental human right is effected in Section 24 of the Constitution. The Constitution is the supreme Law in South Africa. Chapter 2 of the Constitution contains the Bill of Rights including section 24 which provides that: "Everyone has the right- (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that- i. prevent pollution and ecological degradation; ii. promote conservation; and iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development." Other rights protected by the Constitution relevant to environmental authorisations include the right to administrative justice and to information, and rights, known as "socio-economic rights", such as access to clean air. The right to administrative justice is relevant to application and awarding of environmental authorisations because decisions made by the competent authority in the course of the environmental assessment process (such as the decision to accept a scoping report) as well as a final decision on the application fall into the definition of "administrative action". The construction phase of the Project would need to take these principles into account. The Constitution cannot manage or regulate environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld on an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights. NEMA is the principal environmental statute that regulates environmental management and seeks to give effect to the environmental right enshrined in Section 24 of the Constitution.	for the National Environmental Management Act, which is considered the overarching framework for Environmental Impact Assessments.
The Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000)	The purpose of the Promotion of Administrative Justice Act, 2000 (PAJA) is principally to give effect to the right to administrative action that is lawful, reasonable and procedurally fair, to the right to written reasons for administrative action as contemplated in section 33 of the Constitution, and to provide for matters incidental thereto. Administrative law governs the relationships between public bodies, and between public and private bodies and/or individuals. Because so many activities affecting the environment require authorisation from a public body, and environmental conflicts usually arise from the exercise of administrative decision-making powers, administrative law principles are of particular relevance to environmental law	PAJA applies fully to a nuclear power plant EIA in South Africa, requiring all Environmental Authorisation decisions under NEMA to be lawful, reasonable and procedurally fair, with heightened scrutiny due to significant, long-term environmental and public-interest impacts.

Legislation	Description of Legislation	Applicability to NPP
	generally, and specifically in the context of the environmental authorisation requirements stipulated by the provisions of section 24 of the NEMA read with its subordinate legislation regulating environmental impact assessment (or EIA). Environmental licensing and Environmental Authorisations (EAs) issued under section 24 of the National Environmental Management Act, 1998 (NEMA) constitute administrative action for purposes of the Promotion of Administrative Justice Act, 2000 (PAJA). As such, decisions to grant, refuse, amend, suspend or withdraw an EA must comply with PAJA's requirements of lawfulness, reasonableness and procedural fairness. PAJA gives effect to section 33 of the Constitution, while NEMA gives effect to section 24 of the Constitution. The two statutes operate complementarily in environmental governance: NEMA establishes substantive environmental principles and procedures, and PAJA regulates the quality and fairness of administrative decision-making within those processes. Scope of Administrative Action in Environmental Licensing Under NEMA, the following typically constitute administrative action subject to PAJA: ▪ Decisions to grant or refuse an Environmental Authorisation ▪ Approval or rejection of Basic Assessment Reports or Environmental Impact Assessments ▪ Decisions on appeals against Environmental Authorisations ▪ Imposition or amendment of EA conditions ▪ Decisions taken by competent authorities during EIA processes. Core PAJA Requirements in the NEMA Context Lawfulness Environmental licensing decisions must: ▪ Be taken by the competent authority designated under NEMA and the EIA Regulations ▪ Comply with NEMA principles (section 2), the EIA Regulations, and any applicable sectoral environmental legislation ▪ Remain within the scope of the authority's statutory powers A failure to apply mandatory NEMA principles or statutory procedures renders a decision reviewable under PAJA. Reasonableness An EA decision must be rationally connected to: ▪ The information placed before the decision-maker ▪ The environmental impacts identified and assessed ▪ The purpose of NEMA and sustainable development objectives Courts have confirmed that substantial compliance with EIA requirements may suffice, provided the final decision is rational and justifiable in light of the record.	

Legislation	Description of Legislation	Applicability to NPP
	Procedural Fairness Procedural fairness is particularly significant in environmental licensing due to its public impact. PAJA, read with NEMA, requires: ▪ Meaningful public participation for interested and affected parties ▪ Adequate notice of applications and decisions ▪ A reasonable opportunity to submit comments or objections ▪ Proper consideration of representations made during the EIA process Deficiencies in consultation or public participation may result in the EA being set aside on review. Right to Written Reasons Applicants and interested and affected parties whose rights are materially and adversely affected by an EA decision are entitled, on request, to written reasons. Inadequate or absent reasons may give rise to a presumption that the decision was not properly justified, strengthening grounds for review under PAJA. Judicial Review and Remedies Environmental authorisations may be reviewed under PAJA on grounds including: ▪ Procedural unfairness in the EIA process ▪ Failure to consider relevant environmental information ▪ Bias, bad faith, or material errors of law ▪ Unreasonable delay in decision-making Courts may set aside EA decisions, remit matters for reconsideration, or issue just and equitable relief, reinforcing accountability in environmental governance. Significance for Environmental Governance PAJA plays a critical oversight role in environmental licensing by: ▪ Ensuring transparent and participatory decision-making ▪ Protecting both developers' and communities' constitutional rights ▪ Strengthening the legitimacy and defensibility of environmental authorisations ▪ Promoting sustainable development through accountable administration In practice, PAJA functions as the procedural backbone of NEMA-based environmental decision-making, ensuring that environmental authorities exercise their powers fairly, rationally and lawfully.	
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	Closely linked to the notion of administrative justice is the right of access to information. Without access to information, a person may be unable to determine whether or not his or her right to just administrative action (or to an environment not harmful to human health or well-being or, for that matter, any other Constitutional right) has been infringed.	PAIA applies to nuclear EIA processes by enabling access to environmental information held by public and private bodies, supporting informed public participation, transparency, and the protection of

Legislation	Description of Legislation	Applicability to NPP
	The Promotion of Access to Information Act, 2000 (PAIA) gives effect to section 32 of the Constitution, which guarantees everyone the right of access to: - Information held by the State, and - Information held by another person that is required for the exercise or protection of any rights. In the environmental context, PAIA supports the constitutional right in section 24 by enabling access to environmental information necessary to protect environmental, health, and socio-economic rights. Applicability to EIA Processes EIA processes conducted under section 24 of the National Environmental Management Act (NEMA) rely heavily on access to information. PAIA applies to EIAs by ensuring transparency and access to environmental information held by: - Public bodies (e.g. competent authorities, departments, municipalities), and - Private bodies (e.g. project proponents, consultants, Environmental Assessment Practitioners), where such information is required to exercise or protect environmental or participatory rights. Access to Environmental Information In the EIA context, PAIA may be used to request access to: - Environmental Impact Assessment reports and specialist studies - Records informing Environmental Authorisation decisions - Correspondence between authorities and project proponents - Information relating to environmental risks, impacts, and mitigation measures PAIA thus complements NEMA's public participation requirements by enabling informed and meaningful engagement in environmental decision-making. Public and Private Bodies' Obligations PAIA imposes duties on: - Public bodies to proactively and responsively disclose information relevant to EIAs, subject to lawful limitations - Private bodies to disclose environmental information where access is required to protect environmental or health-related rights Refusal of access is permitted only on limited grounds set out in PAIA, such as protection of personal information, commercial confidentiality, or national security, and must be properly justified. Role in Public Participation and Procedural Fairness Access to information under PAIA strengthens: - Meaningful public participation in EIAs - Transparency and accountability in environmental governance	environmental and health rights.

Legislation	Description of Legislation	Applicability to NPP
	- The procedural fairness of environmental decision-making processes Where information is withheld or inadequately disclosed, affected parties may be impeded in exercising their rights under NEMA and PAJA, potentially exposing EIA decisions to legal challenge. Enforcement and Oversight PAIA is administered and enforced by the Information Regulator, which oversees compliance by public and private bodies and adjudicates complaints relating to refusals or failures to provide access to information. Significance in Environmental Governance In practice, PAIA serves as a critical transparency mechanism in EIA processes by: - Enabling access to environmental information beyond minimum EIA disclosure requirements - Supporting informed decision-making and public oversight - Reinforcing constitutional environmental rights and accountability in environmental licensing	

7.2 POLICY AND PLANNING CONTEXT

Table 7-2 summarised key policies and plans as an outline of the governance framework for the project.

Table 7-2 – Applicable Policies and Plans

Applicable Policy	Description of Policy
National Development Plan	The National Development Plan aims to eliminate poverty and reduce inequality by 2030. The NDP identifies several enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development. Chapter 3, Economy, and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of <u>GHG</u> emissions and shift to a green low-carbon economy, is one of these challenges. In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012–2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018–2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place. The third phase (2024 – 2030) is aimed at realising the NDP's Vision 2030 outcomes rather than initiating major new reforms. Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes:

Applicable Policy	Description of Policy
	■ Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation. ■ Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted. The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources, will play a much larger role. Role of Energy in the NDP The National Development Plan 2030 positions reliable, affordable and sustainable energy as a foundational enabler of economic growth, industrialisation, employment creation, and improved quality of life. The NDP recognises that South Africa's development objectives cannot be achieved without secure baseload electricity supply, particularly for energy-intensive industries and urbanisation needs. Nuclear Energy in the NDP's Energy Vision While the NDP does not prescribe technology-specific build targets, it explicitly recognises nuclear energy as part of South Africa's future energy mix, particularly for: ■ Long-term baseload electricity generation ■ Energy security and system reliability ■ Decarbonisation and a transition to a low-carbon economy The NDP acknowledges that nuclear power provides stable, low-carbon electricity that complements variable renewable energy sources such as wind and solar, especially as coal-fired capacity is decommissioned over time. Nuclear and the Low-Carbon Transition In the chapter on sustaining the environment and transitioning to a low-carbon economy, the NDP identifies the need to significantly reduce <u>GHG</u> emissions while maintaining economic competitiveness. Nuclear energy is implicitly supported as one of the non-fossil, large-scale energy options capable of meeting emissions reduction objectives without compromising grid stability. Industrialisation and Skills Development The NDP links energy policy to industrial development and skills formation. Nuclear energy is seen as a potential catalyst for: ■ Advanced manufacturing and localisation ■ High-level engineering and scientific skills ■ Research, development, and innovation This aligns with the NDP's broader emphasis on building national capabilities, strengthening technical education, and positioning South Africa competitively in knowledge-intensive sectors. Infrastructure Planning and Long Lead Times The NDP explicitly recognises that large energy infrastructure projects—particularly nuclear—have long planning, financing, and construction horizons. It therefore stresses the importance of: ■ Early policy certainty ■ Robust regulatory institutions ■ Transparent decision-making This long-term planning logic underpins later instruments such as the Integrated Resource Plan (IRP), which operationalises the NDP's strategic intent.

Applicable Policy	Description of Policy
	Governance, Safety, and Public Confidence Consistent with its call for a capable and developmental state, the NDP emphasises that any nuclear programme must be supported by: - Strong regulatory oversight - World-class nuclear safety standards - Public participation and trust These governance principles are central to how nuclear energy is framed in the NDP—not as a short-term fix, but as a strategic national capability requiring institutional maturity and social legitimacy. Relationship to Later Energy Policy The NDP provides the strategic foundation, while later policies—most notably the Integrated Resource Plan—translate this into specific capacity allocations. The renewed inclusion of nuclear energy in IRP 2025 is consistent with the NDP’s original vision of a diversified, low-carbon, and secure energy system. In Summary Within the National Development Plan, nuclear energy is framed as: - A strategic long-term option for baseload electricity - A low-carbon contributor to climate and environmental goals - A driver of industrialisation, skills and technology development - An infrastructure choice requiring strong governance and long-term planning The NDP does not mandate nuclear expansion, but it deliberately keeps the nuclear option open as part of South Africa’s pathway to a resilient, inclusive, and sustainable economy by 2030 and beyond.
Integrated Resource Plan 2025	The Integrated Resource Plan 2010–2030 (IRP 2010) was South Africa’s first comprehensive, long-term electricity planning framework, developed by the Department of Energy and gazetted in March 2011. It replaced the 2001 Energy Security Master Plan and set out how forecast electricity demand from 2010 to 2030 would be met at least cost, subject to environmental and policy constraints. The IRP was designed as a “living plan”, intended to be periodically updated as assumptions and conditions changed. The Integrated Resource Plan 2025 (IRP 2025) is South Africa’s official long term electricity planning framework, approved by Cabinet in October 2025 and gazetted by the Department of Electricity and Energy (DEE). It sets out how electricity demand will be met up to 2039, balancing security of supply, cost, and environmental impact, and aligning with the Climate Change Act (2024). Core Objectives of IRP 2025 The IRP 2025 has three primary objectives: - Security of supply – ensure sufficient, reliable electricity capacity to avoid load-shedding - Least cost electricity – optimise system cost while accounting for environmental and technical constraints - Decarbonisation – progressively reduce emissions while maintaining system stability These objectives position electricity as a catalyst for economic growth and industrialisation rather than a binding constraint Scale of investment and capacity expansion - Total new capacity planned: ~105 GW by 2039 - Total investment: approximately R2.23 trillion - The scale is equivalent to building Eskom’s current generation fleet more than twice over This expansion is intended to support ~3% GDP growth by 2030 and long-term economic recovery.

Applicable Policy	Description of Policy
	Future electricity mix (key technologies) By 2039, the IRP 2025 envisages a diversified energy mix: ■ Renewables • ~34 GW wind • ~25 GW utility scale solar PV • ~16 GW distributed generation (mainly rooftop PV) • Renewables become the dominant source of new capacity ■ Energy storage • ~8.5 GW battery energy storage systems (BESS) • Critical for grid stability and renewable integration ■ Gas to power • ~16 GW gas capacity • Plays a flexibility and balancing role, especially as coal retires ■ Nuclear • 5.2 GW of new nuclear capacity by 2039 • Framed as part of a diversified, low carbon baseload mix ■ Coal • Coal remains significant in the medium term, but no major new coal build • Progressive retirement of ageing plants, with exploration of “cleaner coal” demonstration technologies. Near term priorities (to 2030) By 2030, the plan prioritises rapid capacity additions: ■ 11.3 GW solar PV ■ 7.3 GW wind ■ 6 GW gas to power ■ 5.2 GW nuclear (development pathway initiated) ■ 3.1 GW storage These additions are aimed at locking in supply adequacy following the load-shedding crisis of the 2010s and early 2020s. Policy and planning context ■ IRP 2025 updates and replaces the IRP 2023 draft ■ It is a “living plan”, to be reviewed as demand, technology costs, and policy evolve ■ Explicit alignment with: • Electricity Regulation Act (as amended) • Climate Change Act, 2024 • JET objectives ■ Increased emphasis on state led procurement, large bid windows, and coordinated grid expansion. Key implications (high-level) ■ Clear long-term signal in favour of renewables, storage, and grid investment ■ Gas and nuclear are retained for system resilience and energy security ■ Significant opportunities for: • Renewable project development • Grid and transmission infrastructure • Energy storage • Skills development and localisation

Applicable Policy	Description of Policy
New Growth Path (NGP)	Government released the New Economic Growth Path (NGP) Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: energy, transport, communication, water, and housing. The proposed NPP aligns with the objectives of South Africa's NGP Framework, which identifies employment creation, inclusive growth, and equity as central priorities of economic policy. The NGP places strong emphasis on strategic investment in energy infrastructure as 'a key driver of labour-absorbing growth, industrial development, and long-term economic competitiveness. The NPP contributes to these objectives by supporting largescale infrastructure investment, creating employment across the project lifecycle (planning, construction, operation, maintenance, and decommissioning), and enabling downstream economic activity through skills development, localisation, and supply chain participation. In addition, nuclear energy aligns with the NGP's focus on state-private sector partnerships, industrial capability building, and the transition toward a more sustainable and resilient economy by providing reliable baseload electricity to support manufacturing, beneficiation, and broader development objectives. As such, the project supports national and spatial planning goals articulated within EIAs and SDFs.
National Infrastructure Plan (NIP)	South Africa's National Infrastructure Plan 2050 (NIP 2050) is the government's long-term strategic framework for rebuilding, expanding, and modernising infrastructure to support inclusive economic growth, job creation, and service delivery up to the year 2050. It is prepared by Infrastructure South Africa (ISA) under the Department of Public Works and Infrastructure and aligned with the NDP. The NIP 2050 does not list or approve individual projects. Instead, it: ■ Sets a strategic vision for priority infrastructure sectors ■ Identifies systemic constraints (institutional, regulatory, financial) ■ Defines conditions required for successful delivery ■ Guides short-, medium-, and long-term prioritisation, including Strategic Integrated Projects (SIPs). Phase 1 of the NIP 2050 focuses on four mission-critical network infrastructure sectors that are foundational to economic performance: ■ Energy (electricity) • Addresses unreliable supply and capacity constraints. • Prioritises generation expansion, grid strengthening, and transmission investment. • Emphasises least-cost, sustainable energy and improved performance of state-owned entities. • Supports large-scale renewable energy and associated grid infrastructure. ■ Freight transport • Focuses on rail, ports, roads, and logistics corridors. • Seeks to shift freight from road to rail and improve port efficiency. • Highlights reform of Transnet, private sector participation, and corridor-based development (e.g. Durban–Gauteng, Saldanha–Northern Cape). ■ Water infrastructure • Addresses water security, ageing assets, and governance failures. • Prioritises bulk water supply, dams, transfer schemes, and maintenance. • Emphasises financial sustainability of water institutions and improved asset management. ■ Digital communications

Applicable Policy	Description of Policy
	• Aims to expand broadband access and digital infrastructure. • Supports economic competitiveness, service delivery, and inclusion. • Recognises digital networks as core economic infrastructure, not optional services. Across all sectors, the NIP 2050 highlights several system-wide priorities: ■ Infrastructure finance: Greater use of blended finance, private investment, and risk-sharing models. ■ Institutional strengthening: Improved planning, project preparation, procurement, and delivery capability across government. ■ Construction sector revitalisation: Rebuilding a capable, transformed civil construction and supplier industry. ■ Monitoring and reporting: Stronger oversight, transparency, and performance tracking of major infrastructure programmes. ■ Regional integration: Aligning South African infrastructure with Southern African trade and transport networks. Phase 2 of the NIP 2050 expands beyond bulk networks to include distributed and social infrastructure, such as: ■ Human settlements ■ Municipal electricity, water, sanitation, and waste ■ Passenger transport and roads ■ Education and health infrastructure. This phase strengthens the link between infrastructure investment and communities, municipalities, and daily service delivery. The NIP 2050 is implemented partly through Strategic Integrated Projects (SIPs), which: ■ Are nationally prioritised, large-scale infrastructure initiatives ■ Benefit from expedited regulatory and authorisation processes ■ Cover energy, water, transport, digital, social, and regional infrastructure across all provinces. The proposed development is aligned with South Africa's National Infrastructure Plan 2050 (NIP 2050), which provides the national strategic framework for the planning, prioritisation, and delivery of critical infrastructure required to support inclusive economic growth, job creation, and improved service delivery over the long term. The NIP 2050 is designed to give effect to the National Development Plan (NDP) by identifying mission-critical infrastructure sectors, systemic constraints to delivery, and the institutional, regulatory, and financial conditions required to ensure infrastructure investment delivers sustainable socio-economic benefits. The NIP 2050 does not prescribe individual projects; rather, it establishes a strategic policy basis against which infrastructure proposals are assessed in terms of need, desirability, and contribution to national development objectives. In this context, the proposed project is consistent with the intent and priorities of the NIP 2050. The NIP 2050 identifies energy infrastructure, particularly electricity generation and transmission, as a foundational constraint to economic growth and social development. The Plan emphasises the need for: ■ Expanded generation capacity; ■ Strengthened transmission and distribution networks; and ■ Improved reliability and resilience of the national electricity system. The proposed development supports these objectives by contributing to the expansion and/or enabling of energy infrastructure capacity, thereby assisting in addressing supply constraints, supporting economic activity, and enabling downstream industrial and social development. The NIP 2050 is implemented in part through SIPs identified under the Infrastructure Development Act. SIPs represent nationally significant infrastructure initiatives that are prioritised due to their catalytic socio-economic benefits and cross-sectoral importance. The proposed NPP is consistent with the objectives of SIPs relevant to:

Applicable Policy	Description of Policy
	■ Energy generation, transmission, and distribution; ■ Green and sustainable energy initiatives; ■ Regional and corridor-based development; and/or ■ Bulk infrastructure required to unlock investment and development in priority regions. Accordingly, the proposed development supports the broader intent of the SIP framework by contributing to nationally prioritised infrastructure outcomes and enabling coordinated infrastructure delivery. It must be noted that Eskom lodged an application on 20 November 2025 with Infrastructure South Africa (ISA) to register the proposed NPP at the Thyspunt site as a Strategic Infrastructure Project (SIP) project. <u>It is confirmed that Eskom received confirmation of SIP registration on 26 May 2026. There is an error in the confirmation letter in that it only refers to Thyspunt and not the nuclear program. A submission has been made to rectify the reference. Proof of the submission and registration is included in Appendix L.</u>
Nuclear Non-Proliferation Treaty (NPT)	The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is the cornerstone of the global nuclear non-proliferation regime. It was opened for signature on 1 July 1968 and entered into force on 5 March 1970 and was extended indefinitely in 1995. The NPT is built on three mutually reinforcing pillars: ■ Non-proliferation • Nuclear-weapon states (NWS) undertake not to transfer nuclear weapons or assist non-nuclear-weapon states (NNWS) to acquire them. • NNWS commit not to develop or acquire nuclear weapons. • Compliance is verified through International Atomic Energy Agency (IAEA) safeguards, required under Article III of the Treaty. ■ Disarmament • All States Parties commit to pursue negotiations in good faith on effective measures relating to the cessation of the nuclear arms race and to nuclear disarmament (Article VI). [armscontrol.org], [britannica.com] ■ Peaceful Use of Nuclear Energy • The Treaty recognises the inalienable right of all States Parties to develop and use nuclear energy for peaceful purposes. • It promotes international cooperation and technology exchange, subject to safeguards, so that peaceful nuclear use does not contribute to proliferation. The NPT has near-universal membership, with 191 States Parties. Only a small number of states remain outside the Treaty. South Africa is notable for having dismantled its former nuclear weapons programme and acceded as a non-nuclear-weapon state, reinforcing the credibility of the NPT regime. South Africa acceded to the NPT in July 1991 as a non-nuclear-weapon state and concluded a Comprehensive Safeguards Agreement with the IAEA in September 1991. These commitments ensure that all nuclear material and activities in South Africa are used exclusively for peaceful purposes. South Africa is also party to complementary international instruments, including: ■ The Convention on the Physical Protection of Nuclear Material (CPPNM) and its Amendment, strengthening nuclear security obligations. ■ Participation in multilateral export control regimes such as the Zangger Committee and the Nuclear Suppliers Group, supporting responsible nuclear trade consistent with the NPT. South Africa gives domestic effect to its NPT obligations through a comprehensive legislative and regulatory system, including: ■ Nuclear Energy Act, 1999 (Act No. 46 of 1999): This is the principal statute governing nuclear materials and nuclear-related activities. It requires authorisation for controlled

Applicable Policy	Description of Policy
	nuclear activities and provides the legal basis for safeguards, accounting and control of nuclear material in line with NPT and IAEA requirements. ■ Nuclear Non-Proliferation Regulations (2023): These regulations prescribe detailed controls and compliance mechanisms to ensure adherence to international non-proliferation obligations, including licensing, reporting and verification measures. The following institutional arrangements are applicable: ■ The DMPR, through its Chief Directorate for Nuclear Non-Proliferation and Radiation Security, is responsible for policy oversight and implementation of South Africa's international non-proliferation obligations. ■ NECSA, acting as the national authority for safeguards, supports the implementation of nuclear material accounting and control systems and interfaces with the IAEA on safeguards matters. ■ The IAEA conducts inspections and verification activities in South Africa under the safeguards agreements to confirm the absence of diversion of nuclear material from peaceful uses. Since 1994, South Africa's non-proliferation policy has emphasised: ■ Active participation in global non-proliferation regimes, ■ Support for disarmament and arms control, and ■ Ensuring that non-proliferation controls do not impede access to nuclear technology for peaceful and developmental purposes, consistent with Article IV of the NPT. In summary, the NPT establishes a global bargain: preventing the spread of nuclear weapons, advancing disarmament, and enabling peaceful nuclear cooperation. South Africa's domestic implementation is widely regarded as robust and exemplary, reflecting its history of nuclear disarmament, strong legislative controls, and transparent cooperation with the IAEA under the NPT framework.
Nuclear Energy Policy for the Republic of South Africa, June 2008	South Africa's Nuclear Energy Policy, approved in June 2008, establishes the national framework governing the prospecting, mining, processing and use of nuclear materials, as well as the development and utilisation of nuclear energy for peaceful purposes. The policy covers the entire nuclear fuel cycle insofar as it relates to energy generation and explicitly excludes non-energy applications of nuclear technology. The policy's long-term vision is for South Africa to achieve industrial and technological leadership in nuclear energy, securing alternative energy resources for the future through a globally competitive nuclear infrastructure and skilled workforce, while ensuring peaceful use of nuclear technology. The Nuclear Energy Policy sets out multiple strategic objectives, including: ■ Energy security and diversification: Positioning nuclear energy as part of South Africa's diversified primary energy mix to ensure long-term security of supply. ■ Industrial development: Establishing national industrial capability for the design, manufacture, construction and operation of nuclear energy systems and associated fuel-cycle facilities. ■ Governance and regulation: Creating and maintaining robust governance structures to support an expanded nuclear energy programme under effective state oversight. ■ Safety, security and environmental protection: Ensuring the safe, secure and environmentally responsible use of nuclear energy, consistent with national legislation and international obligations. ■ Socio-economic development: Contributing to national economic growth, industrialisation, skills development and transformation through localisation and human capital development in the nuclear sector. ■ Climate considerations: Supporting the reduction of <u>GHG</u> emissions through the deployment of low-carbon nuclear energy technologies. A key feature of the policy is the strategic control of uranium resources, including prospecting, mining and export of unprocessed uranium ore, to maximise national benefit. The policy allows for state participation in the uranium value chain and promotes long-term self-sufficiency across feasible elements of the nuclear fuel cycle, subject to appropriate feasibility studies.

Applicable Policy	Description of Policy
	The policy operates within an established legislative framework, notably the Nuclear Energy Act (1999) and the National Nuclear Regulator Act (1999). Key institutions include: ■ The DMPR for policy oversight, ■ The National Nuclear Regulator (NNR) for nuclear safety and radiation protection, and ■ NECSA as the state entity responsible for nuclear research, development and associated capabilities. The policy emphasises South Africa's commitment to the peaceful use of nuclear energy, compliance with international treaties, and cooperation with bodies such as the International Atomic Energy Agency (IAEA), particularly in safeguards, non-proliferation and nuclear safety. Overall, the Nuclear Energy Policy positions nuclear power as a strategic, long-term component of South Africa's energy system—supporting energy security, industrialisation, skills development and environmental objectives—while maintaining strict standards of safety, security and governance
White Paper on Energy Policy (1998)	The Nuclear Energy Policy, June 2008, is guided by the White Paper on Energy Policy as approved by Government at the end of 1998, where it was retained as one of the policy options for electricity generation. The 1998 White Paper was adopted to realign South Africa's energy sector with post-apartheid development goals, replacing the 1986 energy policy. It recognises South Africa's diverse indigenous energy resource base, explicitly including uranium alongside coal, liquid fuels, gas, and renewables, and stresses the importance of utilising this diversity to support economic growth, security of supply, and social development. [gov.za], [docslib.org] The White Paper treats energy as a strategic national asset, requiring strong state oversight, long-term planning, and public-interest-driven decision-making rather than short-term market optimisation The White Paper sets out five overarching energy policy objectives, which form the foundation of subsequent energy legislation and strategies: ■ Increasing access to affordable energy services, particularly for disadvantaged communities. Nuclear energy is considered indirectly in this objective through its role in providing stable, large-scale baseload electricity within the national system ■ Improving energy governance, including clear institutional roles, effective regulation, and transparent policy formulation. This objective underpins the White Paper's approach to nuclear safety regulation and oversight, recognising the need for strong independent governance arrangements for high risk technologies. ■ Stimulating economic development, with the energy sector viewed as a contributor to GDP, employment, and industrial development. Nuclear energy is acknowledged as part of the existing strategic energy infrastructure contributing to economic stability and long term supply security. ■ Managing energy related environmental and health impacts, including explicit attention to safety, environmental protection, and public health. Nuclear energy is addressed within this framework as requiring particularly stringent environmental, health, and safety controls. ■ Securing energy supply through diversity, which is a central justification for retaining nuclear power as part of the national energy mix, alongside coal, renewables, and other sources The White Paper treats nuclear energy as a distinct supply sector, separate from general electricity generation, signalling its strategic and regulatory significance. Key policy positions include: ■ Recognition of existing nuclear capacity as part of South Africa's electricity system, contributing to supply security and system stability. ■ Continued use of nuclear energy for peaceful purposes, aligned with national development needs and international obligations. ■ Strong emphasis on safety, security, and regulatory control, reflecting the potential environmental and health risks associated with nuclear technologies.

Applicable Policy	Description of Policy
	- State responsibility for oversight, with nuclear generation and regulation clearly positioned within the public governance framework rather than a lightly regulated market environment. The White Paper does not commit to immediate expansion of nuclear capacity, but it deliberately keeps the nuclear option open within a diversified, long term energy planning framework. Under its cross-cutting section on environment, health, and safety, the White Paper stresses that all energy technologies—including nuclear—must be managed in a way that: - Minimises risks to workers, the public, and the environment - Applies precautionary principles - Ensures high standards of regulatory compliance and institutional capacity. This framing laid the groundwork for later, more detailed nuclear specific legislation and policy, including the separate Nuclear Energy Policy adopted in 2008, while the 1998 White Paper establishes the foundational principles rather than detailed nuclear procedures.
Integrated Energy Plan	The development of a National IEP was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development. The IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives are identified, namely: - Objective 1: Ensure security of supply. - Objective 2: Minimise the cost of energy. - Objective 3: Promote the creation of jobs and localisation. - Objective 4: Minimise negative environmental impacts from the energy sector. - Objective 5: Promote the conservation of water. - Objective 6: Diversify supply sources and primary sources of energy. - Objective 7: Promote energy efficiency in the economy. - Objective 8: Increase access to modern energy. The IEP provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and consider the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others. Based on this information the IEP then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The IEP is therefore focused on determining the long-term energy pathway for South Africa, considering a multitude of factors which are embedded in the eight objectives. As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios: - The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term. - The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy.

Applicable Policy	Description of Policy
	■ The Resource Constrained Scenario in which global energy commodity prices (i.e. coal, crude oil and natural gas) are high due to limited supply. ■ The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set out in the NDP, are met. The IEP emphasises the continued pursuit of a diversified energy mix to reduce reliance on a single or limited set of primary energy sources and to enhance long-term security of electricity supply. In assessing existing electricity generation capacity, the IEP indicates a pronounced decline from the mid-2020s as ageing plant is progressively retired, with significant decommissioning milestones occurring around 2031, 2041 and 2048. By 2050, only approximately 20% of current electricity generation capacity is expected to remain operational. This trajectory necessitates substantial new investment in generation capacity to maintain system adequacy and support sustained economic growth. Within this context, nuclear energy is recognised as a strategic, low-carbon baseload technology capable of contributing to long-term supply security as part of a balanced energy mix. From the early 2020s onwards, the IEP assumes the introduction of a range of supply options, including electricity imports, limited new coal capacity, and expanding deployment of wind, solar photovoltaic and gas-fired generation. Over the planning horizon to 2050, the generation mix becomes increasingly diverse across all scenarios, with nuclear energy forming part of the non-fossil capacity portfolio alongside renewables and gas. The principal differences between scenarios relate to assumptions around electricity demand growth, emissions constraints and carbon externality costs. In all scenarios, coal's dominance in electricity generation declines significantly, reducing from approximately 85% in 2015 to around 15–20% by 2050, depending on the scenario. This reduction is offset by increased contributions from solar, wind, nuclear, gas and electricity imports. Nuclear energy's role is particularly relevant in scenarios that require firm, dispatchable, low-emission capacity to complement variable renewable generation and to meet system reliability requirements. The Environmental Awareness and Green Shoots scenarios, which impose more stringent emissions constraints, are characterised by higher shares of renewable energy, with nuclear energy contributing to emissions mitigation while supporting grid stability. Assessment of the scenarios against the eight policy objectives indicates that, while all scenarios aim to minimise system costs within their respective constraints, the Base Case Scenario yields the lowest overall energy system cost, followed by the Environmental Awareness, Resource Constrained and Green Shoots scenarios. In terms of job creation and localisation potential, the Base Case Scenario again performs most strongly, followed by the Resource Constrained, Environmental Awareness and Green Shoots scenarios. Across all scenarios, approximately 85% of total jobs are assessed as localisable. Within the electricity generation sector, the largest share of employment arises from solar technologies, followed by nuclear and wind, with comparatively smaller contributions from natural gas and coal. Nuclear energy therefore presents meaningful opportunities for long-term skilled employment, industrial development and localisation. From an environmental perspective, the Environmental Awareness Scenario delivers the lowest total emissions over the planning horizon, reflecting its stringent emissions limits. This is followed by the Green Shoots, Resource Constrained and Base Case scenarios. These trends are consistent when emissions are assessed both cumulatively and by individual pollutant type. In this regard, nuclear energy contributes to emissions reduction objectives by providing large-scale, low-carbon electricity generation over extended plant lifetimes.
Energy Efficiency Strategy of the Republic of South Africa	The Energy Efficiency Strategy of the Republic of South Africa, published by the DMPR in March 2005, establishes a national framework to address South Africa's high energy intensity and historically inefficient energy use. The strategy recognises that low energy prices and an energy-intensive economic structure, particularly in mining and heavy industry, have resulted in limited incentives to conserve energy. The strategy is intended to support sustainable economic growth by reducing energy consumption without constraining development. The strategy sets out the following core objectives:

Applicable Policy	Description of Policy
	■ To reduce national energy intensity through systematic improvements in energy efficiency ■ To lower the cost of energy services to consumers ■ To enhance security of energy supply by reducing overall demand ■ To mitigate environmental impacts associated with energy production and use ■ To stimulate economic competitiveness and job creation through efficiency improvements The Energy Efficiency Strategy adopts a demand side, technology neutral approach, focusing on how energy is used rather than how it is generated. It emphasises: ■ Standards and regulations, such as appliance efficiency standards and labelling ■ Demonstration projects to show the cost benefits of efficiency measures ■ Behavioural change, supported through information and awareness programmes ■ Government leadership, particularly through energy efficiency upgrades in public buildings The strategy aligns with the White Paper on Energy Policy (1998), which identified efficiency standards and labelling as foundational measures for national energy efficiency efforts The Energy Efficiency Strategy of the Republic of South Africa establishes a national, demand side framework to reduce energy intensity, improve economic competitiveness, enhance security of supply, and mitigate environmental impacts through standards, sector specific interventions, government leadership, and public awareness.
Energy Security Master Plan – Electricity (2007-2025)	The Energy Security Master Plan – Electricity (2007–2025) was developed by the DMPR to provide a long-term planning framework for ensuring secure, reliable, and affordable electricity supply in South Africa over the period 2007 to 2025. The plan responds to: ■ Historical under-investment in electricity infrastructure ■ Growing electricity demand driven by economic growth, electrification, and industrial expansion ■ The need to align electricity planning with broader government policy objectives The Master Plan is aligned with national government objectives, including: ■ Economic growth and development ■ Universal access to electricity ■ Security of supply ■ Environmental sustainability ■ Affordability and reliability of electricity services The plan emphasises the importance of long term, integrated planning to avoid supply shortfalls and to manage uncertainty in demand and investment conditions. The Master Plan sets out the following overarching goals: ■ To ensure adequate generation capacity to meet forecast electricity demand ■ To maintain a reliable and resilient electricity system ■ To support economic infrastructure development ■ To strengthen transmission and distribution networks ■ To improve energy efficiency and demand side management (DSM) as part of supply security The Master Plan provides a structured analysis of the electricity value chain: ■ Generation • Reviews the existing generation fleet • Identifies risks associated with capacity constraints and ageing infrastructure • Highlights the need for timely investment in new generation capacity to avoid supply shortfalls ■ Transmission • Identifies constraints in the transmission network • Emphasises the need for expanded and reinforced transmission infrastructure to support new generation and growing demand

Applicable Policy	Description of Policy
	■ Distribution • Highlights challenges in distribution infrastructure, particularly in residential and economic nodes • Notes under-investment in distribution networks and its implications for reliability and access A dedicated section of the Master Plan addresses energy efficiency and DSM as critical components of electricity security. The plan: ■ Recognises energy efficiency as a cost-effective means of reducing demand growth ■ Calls for accelerated DSM programmes ■ Sets out DSM targets and activities to complement generation expansion Energy efficiency is treated as a strategic resource, not merely a supporting measure.
Radioactive Waste Management Policy and Strategy (2005)	The Radioactive Waste Management Policy and Strategy (2005) was approved by Cabinet and published by the DMPR to establish a comprehensive national governance framework for the safe, secure, and environmentally responsible management of radioactive waste in South Africa. Its vision is that radioactive waste in South Africa shall be managed in accordance with: ■ National objectives ■ Recognised international principles and safety standards ■ Transparent and consultative governance practices The policy applies to all radioactive waste generated in South Africa, regardless of origin, including waste from: ■ Nuclear power generation ■ Nuclear fuel cycle activities (past and present) ■ Radioisotope production and use ■ Medical, industrial, research, and mining activities It covers the full radioactive waste management lifecycle, from generation through to storage and disposal. The policy sets out the following key objectives: ■ To protect people, property, and the environment, now and in the future ■ To ensure radioactive waste management complies with international best practice ■ To establish clear institutional roles and responsibilities ■ To ensure long-term sustainability and intergenerational equity in waste management decisions ■ To promote transparency, public participation, and stakeholder consultation The policy is underpinned by both international and national radioactive waste management principles, including: ■ Protection of human health and the environment ■ Responsibility of the waste generator for safe management ■ Avoidance of undue burdens on future generations ■ Use of a stepwise approach to waste management Final disposal as the ultimate objective, while recognising interim storage as part of the process The policy defines and classifies radioactive waste according to activity level and longevity, and provides guidance on the management of: ■ LLW and ILW ■ HLW and used (spent) nuclear fuel It recognises that: ■ South Africa generates relatively small volumes of HLW

Applicable Policy	Description of Policy
	- Decisions on long term management options for HLW and spent fuel require careful evaluation and stakeholder engagement The policy clarifies responsibilities across the radioactive waste management system: - Government sets policy and ensures oversight - Regulatory bodies, including the National Nuclear Regulator, enforce safety and compliance - Generators and operators are responsible for managing the waste they produce It also identified the need for an independent national radioactive waste disposal organisation, which later led to the establishment of the National Radioactive Waste Disposal Institute (NRWDI) under the NRWDI Act, 2008 South Africa's Radioactive Waste Management Policy and Strategy (2005) is fully aligned with IAEA radioactive waste management principles, translating international safety fundamentals into a national policy framework that reflects South Africa's specific institutional, historical, and waste inventory context.
United Nations Declaration on the Rights of Indigenous People, 2008	The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) is the most comprehensive international instrument addressing the rights of Indigenous peoples. It establishes minimum global standards for the recognition, protection, and promotion of Indigenous peoples' rights worldwide. UNDRIP is a non-legally binding declaration, but it carries significant moral, political, and normative authority and is grounded in existing international human rights law UNDRIP is built around several foundational principles: - Equality and non-discrimination, affirming that Indigenous peoples are equal to all other peoples while retaining the right to be different and respected as such - Self-determination, recognising Indigenous peoples' right to freely determine their political status and pursue their economic, social, and cultural development - Respect for cultural diversity, acknowledging Indigenous cultures, traditions, histories, languages, and identities as part of humanity's shared heritage The Declaration recognises both individual and collective rights, including rights to: - Culture, language, religion, and identity - Education, health, employment, and social well-being - Protection from forced assimilation or destruction of culture This dual recognition reflects the collective nature of Indigenous societies. UNDRIP affirms Indigenous peoples' rights to: - Lands, territories, and resources they have traditionally owned, occupied, or used - Protection against forced displacement - Redress where lands or resources have been taken without consent These provisions address historical dispossession and its ongoing impacts. The Declaration establishes Indigenous peoples' right to: - Participate in decision making in matters affecting their rights - Maintain and strengthen their own political, legal, economic, and social institutions A central feature is the principle of Free, Prior and Informed Consent (FPIC), which requires States to consult and cooperate with Indigenous peoples before adopting measures that may affect them. UNDRIP affirms the right of Indigenous peoples to recognition and self-identification and to be treated as distinct rightsholders. Both alternative site lies within a region with long established rural communities and cultural and heritage landscapes linked to Khoisan and other Indigenous histories. The EIA has identified the Indigenous or traditional communities potentially affected by the NPP, its exclusion zones, and associated infrastructure (roads, transmission lines, marine outfalls).

Applicable Policy	Description of Policy
	The UNDRIP is relevant to the NPP as an international benchmark that reinforces South African EIA requirements on participation, cultural protection, environmental justice, and intergenerational equity, particularly given the scale, coastal location, and long term impacts of the NPP.
Draft National Strategy for Sustainable Development (NSSD)	The Draft National Strategy for Sustainable Development (NSSD) was developed to provide South Africa with a coherent national framework for integrating environmental protection, social development, and economic growth into decision-making across all sectors of government and society. It responds to the recognition that development must occur within ecological limits while addressing persistent challenges of poverty, inequality, and unemployment. The strategy is aligned with: ■ The Constitution of South Africa ■ The NDP ■ South Africa's commitments to the global sustainable development agenda, including the UN sustainable-development framework The overarching objective of the Draft NSSD is to <i>"Promote sustainable development by ensuring that economic development, social equity, and environmental integrity are mutually reinforcing, rather than competing, objectives"</i>. The strategy seeks to mainstream sustainability principles into policies, planning processes, and implementation mechanisms at national, provincial, and local levels. The Draft NSSD is underpinned by a set of guiding principles, including: ■ Intergenerational equity, ensuring that current development does not compromise the ability of future generations to meet their needs ■ Intragenerational equity, focusing on poverty eradication and social justice ■ Environmental protection and ecological sustainability ■ Integrated and long-term planning ■ Participatory governance, including stakeholder engagement and transparency These principles reflect the sustainability principles embedded in South Africa's environmental governance framework, particularly under NEMA. The Draft NSSD identifies key focus areas for advancing sustainable development: ■ Sustainable Economic Development • Promoting economic growth that is resource-efficient and inclusive • Encouraging cleaner production, sustainable consumption, and innovation • Supporting economic activities that generate employment while reducing environmental harm ■ Social Development and Human Well-Being • Addressing poverty, inequality, and access to basic services • Enhancing health, education, and quality of life • Ensuring that development outcomes are socially equitable ■ Environmental Sustainability • Protecting ecosystems, biodiversity, and natural resources • Managing pollution and waste • Ensuring sustainable use of land, water, and energy resources The Draft NSSD emphasises the need for: ■ Strong institutional coordination across government departments ■ Clear roles and responsibilities for implementing sustainable-development objectives ■ Integration of sustainability considerations into planning, budgeting, and monitoring systems ■ Use of indicators to track progress toward sustainability goals

Applicable Policy	Description of Policy
	The Draft NSSD reinforces the role of environmental assessment tools, such as Environmental Impact Assessments (EIAs) and strategic planning instruments, as mechanisms for operationalising sustainable development principles in practice.

Table 7-3 outlines a direct, policy-level mapping of the NDP objectives to the nuclear-related provisions of the IRP 2025, showing how IRP 2025 operationalises the NDP's long-term intent.

Table 7-3 – NDP Objectives Mapped to IRP 2025 Nuclear Provisions

NDP OBJECTIVE (VISION 2030)	WHAT THE NDP SAYS (STRATEGIC INTENT)	IRP 2025 NUCLEAR PROVISION (OPERATIONAL RESPONSE)
Energy security and reliable electricity supply	The NDP identifies reliable and affordable electricity as a prerequisite for economic growth, industrialisation and social development, and recognises the need for firm, dispatchable capacity alongside variable generation	IRP 2025 provides for 5 200 MW of new nuclear capacity by 2039 to supply dispatchable, baseload power that stabilises the system as coal is retired and renewables expand
Diversification of the energy mix	The NDP supports a diversified energy portfolio to reduce over-reliance on a single energy source and improve system resilience	IRP 2025 explicitly includes nuclear as part of a diversified future mix, alongside wind, solar, gas, storage and reduced coal, increasing nuclear's share from current levels
Transition to a low carbon economy	The NDP calls for a transition to a low carbon and climate resilient growth path while maintaining economic competitiveness and grid stability	IRP 2025 positions nuclear as a low carbon, nonintermittent technology that complements renewables and supports emissions reduction goals while maintaining reliability
Support for industrialisation and economic growth	The NDP links energy availability and price stability to industrial development, exports, and job creation, especially in energy intensive sectors	IRP 2025 frames nuclear as enabling long term industrial growth, explicitly noting its role in supporting largescale, stable power demand and economic expansion
Development of national capabilities and skills	The NDP emphasises building advanced skills, technical capabilities, and innovation systems to support a modern, competitive economy	IRP 2025 links new nuclear build to a Nuclear Industrialisation Plan, aimed at rebuilding skills, localisation, and participation across the nuclear value chain
Long-term infrastructure planning	The NDP recognises that large infrastructure projects have long lead times and require early, coordinated planning and policy certainty	IRP 2025 schedules nuclear for the post 2030 horizon, explicitly acknowledging long development timelines and aligning with the NDP's long range planning logic
Building a capable and developmental state	The NDP stresses strong institutions, regulatory capacity, and governance to manage complex infrastructure and technology choices	IRP 2025 emphasises state-led planning, robust regulation, and transparent procurement for nuclear, with implementation linked to institutional readiness
Public interest, safety, and environmental protection	The NDP underscores the importance of environmental sustainability, public trust, and regulatory oversight in major development decisions	IRP 2025 reaffirms that nuclear development must comply with world-class safety, licensing, and environmental standards, with public participation processes embedded in implementation

Table 7-4 outlines a nuclear specific policy- alignment- table comparing the Draft NSSD with the NEMA Section 2 principles.

Table 7-4 – Draft NSSD vs NEMA Principles (NPP EIA Context)

THEME / PRINCIPLE	DRAFT NSSD – STRATEGIC INTENT	NEMA SECTION 2 – LEGAL PRINCIPLE	APPLICATION IN A NUCLEAR POWER PLANT EIA
Sustainable development	Promotes integrated economic growth, social development, and environmental protection within ecological limits.	Requires integration of social, economic, and environmental factors in planning and decision making (s 2(3)).	The NPP EIA must demonstrate that electricity security and economic benefits are balanced against environmental protection, safety, and social impacts over the full life cycle (construction, operation, decommissioning).
Intergenerational equity	Emphasises long-term sustainability and safeguarding natural systems for future generations.	Everyone has the right to an environment protected for the benefit of present and future generations (s 2(4)(a)).	Critical for nuclear projects due to long operational lifetimes, radioactive waste, decommissioning, and land-use legacies; the EIA must consider long-term and post-closure impacts.
Intragenerational equity and social justice	Focuses on poverty reduction, inequality, and equitable access to development benefits.	Environmental management must place people and their needs at the forefront and serve the interests of vulnerable and disadvantaged communities (s 2(2)).	The EIA must assess whether local communities (including rural or traditional communities) bear disproportionate risks relative to national benefits from nuclear power generation.
Environmental protection and ecological integrity	Calls for protection of ecosystems, biodiversity, and sustainable use of natural resources.	Pollution and ecological degradation must be avoided or minimised; ecosystems must not be irreversibly damaged (s 2(4)(a), (r)).	For a coastal NPP, the EIA must rigorously assess marine ecology, coastal processes, water abstraction, thermal discharges, and cumulative impacts on sensitive ecosystems.
Precautionary approach	Supports risk-aware and cautious development under conditions of uncertainty.	A risk-averse and cautious approach must be applied, considering limits of current knowledge (s 2(4)(a)(vii)).	Central to nuclear EIAs: low-probability, high-consequence events (accidents, extreme climate events) must be considered even where uncertainty exists.
Polluter pays / internalisation of costs	Encourages responsible resource use and long-term cost awareness.	Costs of remedying pollution and environmental degradation must be borne by those responsible (s 2(4)(p)).	The EIA must demonstrate financial provision for mitigation, waste management, decommissioning, and environmental rehabilitation associated with the NPP.
Public participation and governance	Emphasises participatory governance, transparency, and inclusive decision-making.	Decisions must be transparent and must ensure participation of interested and affected parties (s 2(4)(f), (k)).	Given the risk profile of nuclear projects, the EIA must go beyond minimum consultation requirements and ensure meaningful, well-documented stakeholder engagement.

THEME / PRINCIPLE	DRAFT NSSD – STRATEGIC INTENT	NEMA SECTION 2 – LEGAL PRINCIPLE	APPLICATION IN A NUCLEAR POWER PLANT EIA
Integrated planning and cooperative governance	Seeks sustainability mainstreaming across sectors and spheres of government.	Requires coordinated decision making and cooperative environmental governance (s 2(4)(l)).	The NPP EIA must align with energy planning (IRP), nuclear regulation (NNR), water, coastal, climate, and disaster-risk governance frameworks.

Table 7-5 outlines a nuclear-specific policy-alignment table comparing the NDP with the NEMA Section 2 principles.

Table 7-5 – NDP vs NEMA Principles (NPP EIA Context)

NDP OBJECTIVE / PRINCIPLE	RELEVANT NEMA SECTION 2 PRINCIPLE	NUCLEAR SPECIFIC ALIGNMENT INTERPRETATION
Eliminate poverty and reduce inequality by 2030 through inclusive growth	Environmental management must place people and their needs at the forefront, serving physical, psychological, developmental, cultural and social interests	Nuclear energy is framed as enabling long term energy security and economic stability, supporting industrial growth and employment while requiring strong protection of communities from health and environmental risks
Build a capable developmental state with strong institutions	Environmental governance must be integrated, coordinated and transparent, with accountable decision making	Nuclear projects require robust regulatory oversight, inter-departmental coordination (energy, environment, health, emergency planning), and transparent licensing consistent with NEMA governance principles
Ensure reliable and affordable energy to support economic growth	Development must be socially, environmentally and economically sustainable	Nuclear power contributes to baseload reliability, but must demonstrate sustainability across safety, waste management, decommissioning and inter-generational risk
Transition to a low carbon and climate resilient economy	Environmental management must promote sustainable development and minimise pollution and environmental degradation	Nuclear energy aligns with low operational carbon emissions, provided lifecycle impacts (fuel cycle, waste, cooling water, land use) are managed in accordance with NEMA principles
Long-term infrastructure planning and investment	Decisions must take into account the interests, needs and values of all interested and affected parties	Nuclear development requires early, continuous and meaningful public participation, particularly given long project lifecycles, perceived risk, and inter-generational implications
Promote inter-generational equity and long-term planning	Environmental management must ensure that negative impacts are avoided, minimised, or remedied, and that costs are borne by those responsible	Nuclear waste management, decommissioning funding, and long-term site stewardship directly reflect intergenerational equity and polluter pays principles
Risk-aware planning and resilience	A risk averse and cautious approach must be applied where impacts are uncertain	Nuclear energy is inherently aligned with the precautionary principle, requiring conservative design, safety margins, emergency planning zones, and continuous risk assessment

NDP OBJECTIVE / PRINCIPLE	RELEVANT NEMA SECTION 2 PRINCIPLE	NUCLEAR SPECIFIC ALIGNMENT INTERPRETATION
Integrated spatial and infrastructure planning	Environmental management must be integrated, acknowledging that environmental impacts cannot be considered in isolation	Nuclear siting decisions must integrate coastal processes, biodiversity, water resources, land use planning, and disaster risk management, consistent with NEMA's integrated approach
Just transition and social cohesion	Environmental justice must be pursued so that adverse impacts are not disproportionately borne by vulnerable communities	Nuclear projects must avoid concentrating environmental or social risk on coastal, rural or economically marginalised communities, and ensure fair distribution of benefits
Evidence based decision making	Decisions must be based on best available information, and uncertainty must be addressed explicitly	Nuclear authorisation depends on specialist studies, conservative modelling, peer review and regulatory scrutiny, directly reflecting NEMA's evidence based principle

7.3 NATIONAL ENERGY LEGAL FRAMEWORK

Table 7-6 summarised key national energy legislation applicable to the project.

Table 7-6 – Applicable National Energy Legislation

Legislation	Description of Legislation	Applicability to NPP
National Energy Act (Act No. 34 of 2008)	The National Energy Act establishes South Africa's overarching framework for energy policy, planning, and governance. Its primary objective is to ensure that diverse energy resources are available in sustainable quantities and at affordable prices to support economic growth and poverty alleviation, while taking into account environmental management requirements and cross-sectoral interactions. The main objectives of the Act are to: ■ Ensure uninterrupted supply of energy to the Republic; ■ Promote diversity of supply of energy and its sources; ■ Facilitate effective management of energy demand and its conservation; ■ Promote energy research; ■ Promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy; ■ Ensure collection of data and information relating to energy supply, transportation and demand; ■ Provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development; ■ Provide for certain safety, health and environment matters that pertain to energy; ■ Facilitate energy access for improvement of the quality of life of the people of Republic; ■ Commercialise energy-related technologies; ■ Ensure effective planning for energy supply, transportation, and consumption; and ■ Contribute to sustainable development of South Africa's economy.	The National Energy Act applies to the NPP by requiring alignment with integrated energy planning, supporting long-term energy security, infrastructure investment, data provision, and compliance with national sustainability and policy objectives.

Legislation	Description of Legislation	Applicability to NPP
	In terms of the Act, the Minister of Energy is mandated to develop and, on an annual basis, review and publish the Integrated Energy Plan (IEP) in the Government Gazette. The IEP analyses current energy consumption trends within different sectors of the economy (i.e. agriculture, commerce, industry, residential and transport) and uses this to project future energy requirements, based on different scenarios. The IEP and the Integrated Resource Plan are intended to be updated periodically to remain relevant. The framework is intended to create a balance between energy demand and resource availability so as to provide low-cost electricity for social and economic development, while taking into account health, safety and environmental parameters. While the Act it is technology-neutral, it is directly applicable to nuclear energy because nuclear power is an energy resource, relies on strategic energy infrastructure, and has implications for security of supply, environmental protection, and long-term planning. For nuclear projects, the Act: ■ Establishes the policy and planning context within which nuclear decisions must be made ■ Provides the legal basis for Integrated Energy Planning, against which nuclear new-build or life-extension projects are justified ■ Supports energy security, long-term capacity adequacy, and diversification of the energy mix. Section 6 (Integrated Energy Planning) is the most critical provision for nuclear energy. Nuclear power must be assessed and motivated within the Integrated Energy Plan (IEP), alongside all other viable energy options (coal, gas, renewables, storage, imports). Planning must consider: ■ Long-term demand–supply balance ■ Environmental, health, and safety impacts ■ Economic viability and affordability ■ Regional and cross-sectoral interactions The IEP must have a minimum 20-year planning horizon, which aligns naturally with nuclear plant lifecycles and capital recovery periods. For regulatory compliance: ■ Nuclear infrastructure decisions outside the IEP framework risk legal and policy challenge ■ Public consultation requirements under the IEP process are particularly relevant for nuclear projects due to their societal and environmental sensitivity. [faolex.fao.org] Section 6 formally commenced on 1 April 2024, reinforcing the statutory weight of integrated planning for major infrastructure decisions, including nuclear.	
Electricity Regulation Act (Act No. 4 of 2006)	The Electricity Regulation Act (No. 4 of 2006) (ERA) establishes South Africa's national regulatory framework for the electricity supply industry. Its primary purpose is to regulate the generation, transmission, distribution, reticulation, trading, and import and export of electricity, and to ensure that electricity supply is efficient, sustainable, and orderly. While nuclear safety and fuel-cycle issues are regulated under nuclear-specific legislation, the ERA governs whether and how a nuclear facility may generate and sell electricity.	The Electricity Regulation Act applies to nuclear generation by requiring NERSA licensing, ministerial determination of new capacity, regulated tariffs, grid integration, and ongoing compliance for electricity production and sale.

Legislation	Description of Legislation	Applicability to NPP
	The Electricity Regulation Act (No. 4 of 2006) (ERA) aims to: <i>“Achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa”;</i> This is achieved by ensuring that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency, effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic, by: ▪ Facilitating investment in the electricity supply industry; ▪ Facilitating universal access to electricity; ▪ Promoting the use of diverse energy sources and energy efficiency; ▪ Promoting competitiveness and customer and end user choice; and ▪ Facilitating a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public. The Act designates the National Energy Regulator of South Africa (NERSA) as the custodian and enforcer of the national electricity regulatory framework. [gov.za] NERSA’s functions include: ▪ Issuing, amending, renewing, suspending, or revoking electricity licences ▪ Regulating tariffs and pricing principles ▪ Monitoring compliance with licence conditions ▪ Resolving disputes within the electricity sector. A core feature of the Act is the licensing regime. The Act requires that activities such as, electricity generation, transmission, distribution and reticulation, trading, and import and export of electricity may only be undertaken under a licence or registration issued by NERSA, unless explicitly exempted. Licences are subject to: ▪ Conditions set by NERSA ▪ Compliance with tariff principles ▪ Ongoing monitoring and enforcement powers, including inspections and investigations. The NPP may not generate electricity unless it holds a generation licence issued by the National Energy Regulator of South Africa (NERSA), unless specifically exempted by law or regulation. This means that: ▪ A NERSA generation licence is mandatory, in addition to nuclear and environmental authorisations ▪ Licence conditions may address capacity, grid connection, operational compliance, and reporting obligations ▪ Non-compliance with licence conditions can lead to enforcement action, including suspension or revocation. The Act provides for regulation of new generation capacity, including circumstances where new capacity is required in the national interest. In practice, nuclear new-build projects are typically enabled through ministerial determinations under the ERA framework, followed by licensing by NERSA.	

Legislation	Description of Legislation	Applicability to NPP
	This positions the ERA as: ■ The legal gateway for approving new nuclear generation capacity ■ The mechanism linking national energy policy decisions to enforceable licences The Electricity Regulation Act does not regulate nuclear safety, radiation protection, or fuel handling. Instead, it operates alongside: ■ The Nuclear Energy Act (nuclear installations and materials) ■ Environmental legislation (EIA and authorisation) ■ The National Energy Act (planning and energy security) Within this framework, the ERA governs electricity market participation and generation authorisation, making it indispensable to any nuclear electricity project.	
Nuclear Energy Act (Act No. 46 of 1999)	The Nuclear Energy Act (Act No. 46 of 1999) establishes South Africa's legal framework for nuclear energy governance, focusing on state ownership and control of nuclear assets, nuclear non-proliferation, and regulation of nuclear material and fuel cycle activities. It gives effect to South Africa's international nuclear obligations, particularly under the Nuclear Non-Proliferation Treaty (NPT) and International Atomic Energy Agency (IAEA) safeguards. A central feature of the Act is the establishment of the South African Nuclear Energy Corporation SOC Ltd (NECSA) as a state-owned company. The Act: ■ Defines NECSA's functions, powers, governance, and accountability ■ Provides for its board of directors and chief executive officer ■ Transfers assets, liabilities, and functions from the former Atomic Energy Corporation ■ Regulates financial management, auditing, and state oversight. NECSA's functions include nuclear research and development, isotope production, nuclear fuel cycle related activities, and management of nuclear installations assigned to it. Nuclear Non-Proliferation and International Obligations The Act assigns responsibility to the Minister for ensuring South Africa's compliance with: ■ The Safeguards Agreement with the IAEA ■ Any additional protocols concluded under the NPT framework To support this, the Act: ■ Requires authorisation for the acquisition, possession, and use of nuclear material, restricted material, and nuclear-related equipment ■ Regulates the import and export of such material and equipment ■ Prohibits certain acts relating to nuclear material to prevent proliferation. Control of Nuclear Material and Fuel Cycle Activities	The Nuclear Energy Act applies by regulating state control of nuclear materials, fuel, waste and installations, establishing NECSA, and ensuring compliance with international nuclear non-proliferation and safeguards obligations.

Legislation	Description of Legislation	Applicability to NPP
	The Act provides a comprehensive control regime for: ■ Nuclear fuel ■ Source material and special nuclear material ■ Restricted material and nuclear-related equipment Authorisations are required for: ■ Possession and use ■ Import and export ■ Certain processing or handling activities Inspectors are empowered to monitor compliance, conduct inspections, and enforce the Act's provisions relating to restricted acts and materials. Radioactive Waste and Irradiated Nuclear Fuel The Act prescribes measures for: ■ Discarding and management of radioactive waste ■ Storage of irradiated (spent) nuclear fuel These provisions establish state oversight and control over waste and spent fuel, forming a legal foundation for long-term waste management responsibilities in South Africa. [gov.za] Ministerial Powers and Oversight The Minister is granted extensive powers to: ■ Make determinations regarding nuclear material and restricted activities ■ Grant, refuse, or withdraw authorisations ■ Delegate or assign certain functions under the Act ■ Ensure national security and international compliance obligations are met.	

7.3.1 NUCLEAR INSTALLATION SITE LICENCE APPLICATION

South Africa's nuclear licensing regime is centred on the National Nuclear Regulator (NNR), established under the National Nuclear Regulator Act, 47 of 1999. The NNR's mandate is to protect people, property, and the environment against nuclear damage by regulating nuclear installations and nuclear-related activities. The key legislation shaping the process includes:

- National Nuclear Regulator Act (Act 47 of 1999) – licensing and safety regulation
- Nuclear Energy Act (Act 46 of 1999) – governance of nuclear materials and installations
- National Environmental Management Act (NEMA) – environmental authorisation via EIA processes
- National Radioactive Waste Disposal Institute Act (Act 53 of 2008) - management and disposal of radioactive waste

No nuclear installation may be sited, constructed, operated, or decommissioned without an appropriate Nuclear Installation Site Licence (NISL) issued by the NNR.

The following high-level steps are involved in the NISL Application process.

Step 1: Project concept and feasibility

The proponent develops a nuclear project concept (e.g. power reactor, research reactor, fuel cycle facility), including high-level siting, technology selection, and feasibility studies. At this stage, no authorisation is granted, but regulatory pathways are identified.

Step 2: Environmental Authorisation (NEMA)

Before nuclear licensing can be finalised, the project must undergo a NEMA Environmental Impact Assessment (EIA) process, including:

- Baseline environmental studies
- Impact assessments
- Public participation
- Record of Decision (Environmental Authorisation)

The NNR participates as a commenting authority, ensuring alignment between nuclear safety and environmental requirements.

Step 3: NNR pre-application engagement

The NNR encourages early engagement prior to formal licence submission. This may include:

- Clarification of licensing stages
- Agreement on applicable safety standards (IAEA-aligned)
- Identification of required safety submissions

This phase reduces regulatory risk but does not constitute approval.

Step 4: Submission of Nuclear Installation Licence application

The applicant formally submits a Nuclear Installation Site Licence (NISL) application to the NNR. Typical submissions include:

- Site safety assessment
- Design and safety case documentation
- Radiation protection programme
- Emergency preparedness plans
- Decommissioning strategy and financial provision

Applications are made directly to the NNR in the prescribed format.

Step 5: NNR safety and technical assessment

The NNR conducts a detailed, multi-disciplinary safety assessment, which may include:

- Independent technical reviews
- Requests for additional information
- Benchmarking against international best practice (IAEA, WENRA)

This stage may involve external technical support but remains under NNR authority.

Step 6: Public participation and stakeholder consultation

Public consultation is a statutory requirement. The process includes:

- Public notices
- Public meetings
- Consideration of objections and submissions

Public input informs the regulatory decision but does not replace technical safety compliance.

Step 7: Regulatory decision and licence issuance

If satisfied, the NNR may:

- Grant a NISL
- Grant a licence with conditions
- Request further information
- Refuse the application

Licences are issued with binding conditions and may be staged (e.g. construction-related approvals before operation).

Step 8: Construction, operation, or decommissioning

Licensed activities may proceed only within the scope and conditions of the licence. Certain activities may still require prior NNR approval even after licensing (hold points).

Step 9: Ongoing compliance and regulatory oversight

Throughout the lifecycle, the NNR conducts:

- Inspections
- Compliance audits
- Licence amendments
- Enforcement actions if required

Regulatory oversight continues until final decommissioning and site release.

7.4 NUCLEAR GOVERNANCE

Table 7-7 summarised key policies and guidelines related to nuclear governance both nationally and internationally.

South Africa's National Nuclear Policy is articulated through the White Paper on Energy Policy (1998), the Nuclear Energy Act (1999), the National Nuclear Regulator Act (1999), and subsequent amendments, together with international nuclear safety conventions to which South Africa is a signatory.

Table 7-7 – Relevant Policy and Guidelines related to Nuclear Governance

Legislation / Policy	Description
International Atomic Energy Agency (IAEA)	The IAEA has unique statutory responsibilities within the United Nations (UN) family for establishing standards for protecting people and the environment from harmful effects of ionising radiation and for the safety of facilities and activities that give rise to radiation risks. Member States can apply these standards by means of its regulatory provisions for nuclear and radiation safety. In doing so, they rely heavily on the work of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and the International Commission on Radiological Protection (ICRP). The IAEA safety standards, comprising Safety Fundamentals, Safety Requirements and Safety Guides, are applied by the IAEA and joint sponsoring organisations to their own operations, and are recommended for use by States and national authorities and by other international organizations in relation to their own activities. Regulating nuclear and radiation safety is a national responsibility, and many Member States, including

Legislation / Policy	Description
	South Africa, have decided to adopt the IAEA's safety standards for use in their national regulations. The IAEA's nuclear energy guidelines are designed to ensure that nuclear technology is used safely, securely, and exclusively for peaceful purposes. They are not a single document, but a coherent framework of international standards, guidance, and verification systems that Member States may adopt and implement within their national regulatory regimes. The guidelines are commonly grouped into four core pillars: ■ Nuclear Safety ■ Radiation Protection ■ Nuclear Security ■ Safeguards and Non-Proliferation Nuclear Safety Guidelines The Nuclear Safety Guidelines were developed to protect people and the environment from the harmful effects of ionizing radiation arising from nuclear facilities and activities. The IAEA's Fundamental Safety Principles establish: ■ A fundamental safety objective: protection of people and the environment from radiation risks ■ Ten safety principles, including responsibility for safety, leadership and management, accident prevention, emergency preparedness, and protection of future generations These standards apply throughout the entire lifecycle of nuclear facilities and activities, including: ■ Nuclear power plants ■ Research reactors ■ Radioactive waste management ■ Transport of radioactive material The standards are not legally binding, but they represent international consensus and are widely used as benchmarks by national regulators. Radiation Protection Guidelines The objective of these guidelines is to limit radiation exposure and ensure it remains justified, optimized, and controlled. The IAEA guidelines emphasize: ■ Justification of practices involving radiation ■ Optimization of protection (keeping doses as low as reasonably achievable) ■ Dose limitation for individuals Nuclear Security Guidelines The purpose of these guidelines are to prevent, detect, and respond to intentional malicious acts involving nuclear or other radioactive material. The IAEA publishes guidance through its Nuclear Security Series, which provides international consensus recommendations across four categories: ■ Nuclear Security Fundamentals ■ Recommendations ■ Implementing Guides ■ Technical Guidance The Guidelines address: ■ Physical protection of nuclear material and facilities ■ Security of radioactive sources ■ Detection of material out of regulatory control ■ Information and computer security ■ Nuclear security culture

Legislation / Policy	Description
	While nuclear safety focuses on accidents and unintentional events, nuclear security focuses on intentional acts, such as theft or sabotage. The IAEA recognizes that safety and security measures must be balanced and coordinated. Safeguards and Non-Proliferation Guidelines The objective of these guidelines are to provide assurance that nuclear material and activities are not diverted to nuclear weapons or other nuclear explosive devices. IAEA safeguards are implemented through: - Comprehensive Safeguards Agreements - Additional Protocols - On-site inspections - Nuclear material accountancy - Surveillance and monitoring technologies Safeguards derive authority primarily from: - The Treaty on the Non-proliferation of Nuclear Weapons (NPT) - Bilateral safeguards agreements between States and the IAEA Safeguards function as: - A confidence building measure - An early warning mechanism - A trigger for international response in cases of non-compliance In South Africa, IAEA guidelines are not applied directly but are formally domesticated through national legislation and regulatory practice. The key authorities include: - National Nuclear Regulator (NNR) – Independent regulator responsible for nuclear safety, radiation protection, and nuclear security - Department of Electricity and Energy (DEE / DMPR) – Policy authority and international liaison with the IAEA - NECSA – State nuclear operator subject to NNR licensing and IAEA safeguards The IAEA principles are embedded in the following legislation: - National Nuclear Regulator Act, 1999 (Act 47 of 1999), as amended in 2024/2025 - Nuclear Energy Act, 1999 (Act 46 of 1999) The 2024 NNR Amendment Act explicitly modernised South Africa’s framework to align with current IAEA international best practices, including expanded regulatory scope and enhanced enforcement powers. South Africa’s nuclear safety regime is premised on IAEA Safety Standards, supplemented by international best practice (e.g. WENRA reference levels).
National Nuclear Regulator Act (Act No. 47 of 1999)	The National Nuclear Regulator Act establishes South Africa’s nuclear safety regulatory framework. Its primary purpose is to protect persons, property, and the environment from nuclear damage by regulating nuclear activities through enforceable safety standards and regulatory practices. The Act establishes the National Nuclear Regulator (NNR) as an independent statutory body responsible for nuclear safety regulation in South Africa. The NNR succeeds the former Council for Nuclear Safety and operates under public governance and accountability arrangements defined in the Act. It is noted that the Act was amended by the NNR Amendment Act 26 of 2024. The Act assigns the NNR responsibility to: - Exercise regulatory control over nuclear safety - Establish and enforce safety standards and regulatory practices - Grant, amend, suspend, or revoke nuclear authorisations - Conduct inspections and ensure compliance

Legislation / Policy	Description
	- Ensure emergency preparedness and response arrangements are in place. The Act applies to: - The siting, design, construction, operation, decontamination, decommissioning, and closure of nuclear installations - Nuclear vessels and other activities involving radioactive material - Any action capable of causing nuclear damage, including radioactive waste management and transport The Act establishes a mandatory authorisation regime, requiring nuclear installation licences, vessel licences, or certificates of registration or exemption before regulated nuclear activities may be undertaken. Authorisations are subject to conditions and ongoing regulatory oversight by the NNR. A key feature of the Act is the imposition of strict liability on holders of nuclear installation licences for nuclear damage. Licensees must provide financial security to cover potential nuclear damage claims, ensuring public protection and compensation mechanisms are in place. The Act provides for: - Nuclear emergency planning and preparedness - Enforcement powers, including inspections and investigations - Penalties for non-compliance - Appeals and administrative justice mechanisms The National Nuclear Regulator Act operates alongside: - The Nuclear Energy Act, 1999 (state nuclear responsibilities and material control) - The Electricity Regulation Act, 2006 (electricity generation licensing) - The National Energy Act, 2008 (energy planning and policy) The NNR Act applies by requiring a nuclear power plant to obtain and comply with a nuclear installation licence, meet safety standards, provide financial security, and remain under continuous independent safety oversight. There is no single, all-encompassing NNR guideline document. The National Nuclear Regulator (NNR) regulatory framework consists of multiple acts, regulations, safety standards, and specialized regulatory guides (RG-series). These documents are tailored to specific activities, such as nuclear installations, transport, or radiation protection.
<u>Financial Provision Requirements under the National Nuclear Regulator Act (Act No. 47 of 1999), as amended (Act No. 26 of 2024)</u>¹⁶⁹	The NNR Act establishes a two-tier financial provision framework to ensure that <u>adequate financial resources are in place throughout the lifecycle of a nuclear installation. These provisions are directly applicable to the proposed NPP and are summarised below.</u> <u>Financial Responsibilities of Applicants for and Holders of Authorisations (Section 26A)</u> Section 26A, inserted by the National Nuclear Regulator Amendment Act (Act No. 26 of 2024), imposes a proactive financial provisioning obligation for decommissioning and rehabilitation costs. The key requirements are as follows: <u>An applicant for, or holder of, an authorisation for the construction or operation of a nuclear facility, or for undertaking a nuclear activity, must ensure that adequate financial resources will be available to cover costs associated with the safe</u>

¹⁶⁹ Information on Financial provision added as a result of stakeholder comments and queries in this regard.

Legislation / Policy	Description
	rehabilitation or decommissioning of the facility or activity, including the management of resulting radioactive waste (Section 26A(1)). ■ The financial resources must be commensurate with an activity- or facility-specific cost estimate, must be adjusted if the cost estimate increases or decreases, and must be reviewed as part of the periodic review of the rehabilitation or decommissioning plan (Section 26A(2)(a)–(c)). ■ For existing activities and facilities where financial resources for rehabilitation or decommissioning are not yet available, provisions must be made within a time frame determined by the Regulator, or prior to authorisation renewal or extension, whichever is applicable (Section 26A(3)). This provision ensures that financial readiness for end-of-life obligations is established from the point of application and maintained throughout the operational life of the installation. Financial Security by Holder of Nuclear Installation Licence (Section 29) Section 29 establishes a mandatory financial security framework to underwrite nuclear damage liability. The key provisions are as follows: ■ The Minister must, on the recommendation of the NNR Board and by notice in the Government Gazette, categorise nuclear installations in the Republic according to the potential consequences of a nuclear accident (Section 29(1)). ■ The Minister must, in consultation with the Minister of Finance, determine the level of financial security to be provided by licence holders in respect of each category, as well as the manner in which such financial security is to be provided, to enable the holder to meet any liability incurred under Section 30 of the Act (Section 29(2)(a)–(b)). ■ The Minister may, after consultation with the Board, for as long as the holder may be liable for nuclear damage, increase or decrease the level of financial security; require financial security where none was previously required; discharge the holder from the requirement; or amend the manner of provision (Section 29(3)(a)–(d)). ■ Where nuclear damage has occurred, or is likely to be claimed, the Minister may require additional financial security in an amount determined after consultation with the Board (Section 29(4)). ■ The licence holder must annually provide proof to the Regulator that any claim for compensation, to the amount contemplated in Section 30(2), can be met (Section 29(5)). Financial security must be provided by way of an insurance policy issued by a duly registered insurance company acceptable to the Board, or a monetary guarantee issued by a duly registered bank acceptable to the Board. Strict Liability of Holder of Nuclear Installation Licence for Nuclear Damage (Section 30) Section 30 imposes strict liability on the holder of a nuclear installation licence, meaning the holder is liable for all nuclear damage caused by or resulting from the nuclear installation during the holder's period of responsibility, regardless of intent or negligence (Section 30(1)). Liability for each nuclear accident is limited to the amounts determined under Section 29(2) (Section 30(2)). Additional Liability and Compensation Provisions (Sections 31–35) The Act contains further provisions governing the allocation of liability and mechanisms for compensation: ■ Section 31 addresses liability for nuclear damage caused by nuclear vessels entering or within South African territorial waters. ■ Section 32 extends liability provisions to holders of certificates of registration, in addition to holders of nuclear installation licences. ■ Section 33 provides a mechanism for claims for compensation in excess of the maximum liability amounts set under Section 29, which may involve the State. ■ Section 34 establishes the prescription periods within which claims for nuclear damage must be brought.

Legislation / Policy	Description
	- Section 35 provides for compensation for injuries sustained by Regulator staff in the course of their duties. Relevance to the Proposed NPP The financial provision requirements of the NNR Act are directly applicable to the proposed NPP. Eskom, as the applicant and prospective holder of a nuclear installation licence, will be required to: - Demonstrate, from the point of application, that adequate financial resources are available for the safe decommissioning and rehabilitation of the installation, including the management of resulting radioactive waste, in accordance with Section 26A; - Provide financial security, in the form of an insurance policy or bank guarantee, at a level to be determined by the Minister and commensurate with the categorisation of the proposed installation, in accordance with Section 29; and - Annually provide proof to the NNR that compensation claims, up to the prescribed maximum liability amount, can be met.
DEA – NNR Co-operative Governance Agreement	The legislative requirements for nuclear facilities in South Africa are extensive. In the case of the nuclear power station, two key authorisations are needed from two different regulatory authorities namely DEA (now DFFE) and the NNR. These authorisations are needed prior to construction activities commencing on the site. In terms of the National Nuclear Regulator Act 1999 (Act No. 47 of 1999), the NNR is responsible for managing radiation hazards from nuclear facilities. The National Nuclear Regulator Act therefore regulates nuclear activities. As specified in Chapter 2, section 5 of the NNRA (1999), the object/mandate of the NNR is to: (a) provide for the protection of persons, property and the environment against nuclear damage through the establishment of safety standards and regulatory practices; (b) exercise regulatory control related to safety over- (i) the siting, design, construction, operation, manufacture of component parts, and decontamination, decommissioning and closure of nuclear installations; and (ii) vessels propelled by nuclear power or having radioactive material on board which is capable of causing nuclear damage, through the granting of nuclear authorisations; (c) exercise regulatory control over other actions, to which this Act applies, through the granting of nuclear authorisations; (d) provide assurance of compliance with the conditions of nuclear authorizations through the implementation of a system of compliance inspections; (e) fulfil national obligations in respect of international legal instruments concerning nuclear safety; and (f) ensure that provisions for nuclear emergency planning are in place. However, in terms of the NEMA, the DFFE has a responsibility for assessing the impacts of the nuclear power station on the environment, which impacts are likely to include those relating to certain aspects of the radiological hazards of the facility. In recognition of the dual but distinct responsibility with respect to the assessment of radiation hazards, the NNR and the then DEAT (now known as the DFFE) signed a Cooperative Governance Agreement (CGA) on 15 June 2006. This CGA has subsequently been superseded by a new DEAT-NNR. A copy of the DEA - NNR Co-operative Governance Agreement is included in Appendix A. Cooperative Agreement that was signed on 31 August 2007 and 6 September 2007 by DEAT and NNR respectively. According to the CGA, the scope of the agreement was intended to achieve the following: - Ensuring the effective monitoring and control of the nuclear hazard; - Coordinating the exercise of such functions;

Legislation / Policy	Description
	- Minimising the duplication of such functions and procedures regarding the exercise of such functions; and - Promoting consistency in the exercise of such functions. The CGA essentially provides a framework within which DEAT will consult with NNR on issues related to radiological aspects of the proposed nuclear power station. In addition, the CGA signed in June 2006 provided a basis for the classification of radiological issues as follows: - Category 1: Radiological/radiation issues of a generic nature and not necessarily directly related to the project; - Category 2: Radiological/radiation issues directly related to the proposed project; - Category 3: Issues directly related to the proposed project with a radiological/radiation and non-radiological/radiation dimension; and - Category 4: Issues related to the NNR process e.g. safety standards etc. It was decided that radiological issues pertaining to the nuclear power station EIA should be classified in terms of the CGA in order to specify to what extent certain radiological issues would be considered in the EIR. The DEA issued an explanatory statement on the content of the CGA on 10 February 2009 (Appendix M). This statement indicates that the NNR and DEA agreed that there needs to be streamlining of processes in terms of radiological issues identified in an EIA, provided such an approach: - prevents unnecessary duplications; - does not compromise the mandates and independence of the respective organs of state; - facilitates integration of processes; and - is conducive to efficient and effective decision-making. The statement says that the consideration of radiological issues in an EIA process would result in unnecessary and avoidable duplication. Accordingly it is stated that the DEA will not make a decision on the acceptability of radiological impacts.
Non-Proliferation of Weapons of Mass Destruction Act, 1993 (Act No. 87 of 1993),	The Non-proliferation of Weapons of Mass Destruction Act, 1993 was enacted to control and prevent the proliferation of weapons of mass destruction (WMDs) within South Africa and to ensure the Republic complies with its international non-proliferation obligations. The Act establishes a statutory framework for regulating activities related to nuclear, chemical, and biological weapons, as well as certain dual use goods and technologies that could contribute to WMD programmes. The Act applies to weapons designed to cause mass harm through: - Nuclear explosions - Chemical warfare agents - Biological warfare agents It also regulates controlled goods, which include materials, equipment, software, and technologies that may have legitimate civilian uses but could also be used in WMD development or proliferation. The Act establishes the South African Council for the Non-Proliferation of Weapons of Mass Destruction ("the Council") as the primary oversight and enforcement body. Key functions of the Council include: - Protecting South Africa's interests and fulfilling the State's international non-proliferation obligations - Advising the responsible Minister (currently within the Department of Trade, Industry and Competition) on non-proliferation matters - Administering permits, registrations, and compliance mechanisms - Issuing codes of conduct for persons involved in controlled non-proliferation activities.

Legislation / Policy	Description
	The Act requires that persons or entities involved in manufacturing, acquiring, possessing, using, importing or exporting, and transferring, controlled goods or related technologies must be registered and obtain the necessary permits from the Council. Non-compliance with permit or registration requirements constitutes an offence. The Council may also: - Require the furnishing of information and reports - Demand the submission of samples - Conduct inspections and investigations through appointed inspectors To ensure effective enforcement, the Act provides for: - Boards of inquiry, which may summon individuals and compel the production of documents - Seizure and disposal of controlled goods where necessary - Appeals and judicial review mechanisms for affected parties The Act creates criminal offences for: - Contravening the Act or its regulations - Failing to comply with a code of conduct - Providing false or misleading information - Obstructing inspectors or boards of inquiry Convictions may result in substantial penalties, reflecting the seriousness of WMD-related risks. The Act enables South Africa to enter into, ratify, and give effect to international conventions and treaties on non-proliferation, including instruments relating to nuclear, chemical, and biological weapons. The State is explicitly bound by the Act in fulfilling these obligations. Since its enactment, the Act has been amended multiple times (including in 1995, 1996, 1999, and 2004) and is regularly updated through Government Gazette notices declaring new categories of controlled goods and applicable control measures. Notably, significant updates were published as recently as June 2024, expanding controls over chemical, biological, and nuclear related dual use items.
Section 34(1) of the Electricity Regulation Act	Section 34(1) of the Electricity Regulation Act (ERA) is a ministerial determination which authorises the procurement of new nuclear power generation capacity in South Africa. In practice, it is the legal trigger that allows government to start a nuclear new-build procurement process. Section 34(1) of the ERA empowers the responsible Minister (currently the Minister of Electricity / Energy functions) to determine, in consultation with and subject to concurrence by NERSA, that: - New electricity generation capacity is needed - The type of energy source to be procured (e.g. nuclear, gas, renewables) - The quantity (MW) of capacity - The procurement framework, including: - Who will procure the power - Who will buy the electricity (typically Eskom) - Whether procurement will be competitive and cost-effective When this determination specifies nuclear energy, it is commonly called a “nuclear Section 34 determination.” Why a Nuclear Section 34 is legally important Without a valid Section 34 determination: - Government cannot lawfully procure new nuclear power - Any nuclear build programme would be unlawful and reviewable by courts

Legislation / Policy	Description
	For a Section 34 determination to have legal effect, it must: ■ Be issued by the Minister under section 34(1) ■ Be concurred with by NERSA (the energy regulator) ■ Comply with administrative justice requirements (lawfulness, reasonableness, procedural fairness under PAJA) Recent nuclear Section 34 determinations ■ A Section 34 determination for 2 500 MW of new nuclear capacity was gazetted in January 2024 after NERSA concurrence ■ Following legal challenges and concerns about procedural fairness and public participation, the Minister withdrew that nuclear Section 34 determination in August 2024. ■ Withdrawal did not abandon nuclear policy but reset the process to ensure compliance with legal and regulatory requirements. It is important to note that the IRP establishes the policy envelope for new generation capacity, while a Section 34 determination gives legal effect to a portion of that envelope by authorising procurement; accordingly, Section 34 determinations must be consistent with and may not exceed the capacity allocations contained in the IRP. What a Nuclear Section 34 does <i>not</i> do A nuclear Section 34 determination: ■ ✗ Does not approve a specific reactor or vendor ■ ✗ Does not authorise construction on its own ■ ✗ Does not override environmental, nuclear safety, or procurement laws It only authorises procurement to begin, subject to: ■ Environmental approvals ■ Nuclear safety licensing (NNR) ■ Procurement law compliance ■ Financing approvals
National Radioactive Waste Disposal Institute Act (Act 53 of 2008)	The National Radioactive Waste Disposal Institute Act (“NRWDIA”) came into operation on 1 December 2009 and provides for the establishment of the National Radioactive Waste Disposal Institute (“the Institute”) in order to manage radioactive waste disposal. In this regard, radioactive waste includes any radioactive material (whether natural or artificial) which contains unstable atomic nuclei and which is destined for disposal. The National Radioactive Waste Disposal Institute Act (NRWDI Act) establishes a national statutory body responsible for the management and disposal of radioactive waste in South Africa on a national basis. The Act aims to ensure that radioactive waste is disposed of safely, securely, and in an environmentally responsible manner, separate from waste generation and nuclear operations activities The Institute’s board of directors was officially appointed by the Minister of the Department of Energy in January 2014. The Act establishes the National Radioactive Waste Disposal Institute (NRWDI) as a public entity with legal personality. The State retains a direct interest in the Institute, reflecting the national importance of radioactive waste disposal and long-term safety considerations The Act assigns NRWDI responsibility for the entire radioactive waste disposal lifecycle. Its key statutory functions include: ■ Designing and implementing disposal solutions for all classes of radioactive waste ■ Developing radioactive waste acceptance and disposal criteria ■ Assessing and inspecting radioactive waste to determine suitability for disposal ■ Issuing radioactive waste disposal certificates ■ Managing, operating, and monitoring authorised radioactive waste disposal facilities

Legislation / Policy	Description
	Managing and monitoring closed disposal facilities after closure Chapter 3 of the NRWDIA regulates the application process for the disposal of radioactive waste. Section 23 therein requires that any person who wishes to dispose of radioactive waste apply to the Chief Executive Officer of the Institute in the prescribed format and furnish such information as the Institute's board may require which will be assessed for compliance against the radioactive waste acceptance and disposal criteria contemplated in section 5(c) of the NRWDIA. The Chief Executive Officer may either refuse the application or grant such application subject to certain conditions in terms of section 24 of the NRWDIA. Section 25 of the NRWDIA relates to generators of radioactive waste and stipulates that such parties are responsible for the technical, financial and administrative management of such waste at their premises and when such waste is transported to an authorised waste disposal facility. The generators of such waste are further required to: <i>“(a) develop and implement site-specific waste management plans based on national policy;</i> <i>(b) provide all relevant information on radioactive waste as required by the Chief Executive Officer;</i> <i>(c) demonstrate compliance with any conditions of a radioactive waste disposal certificate; and</i> <i>(d) provide site access to staff of the Institute for inspection against any conditions of the radioactive waste disposal certificate.”</i> Furthermore, in terms of section 25(3) of the NRWDIA the “generators of radioactive waste remain responsible for all liabilities in connection with such radioactive waste under their control until such time as the radioactive waste had been received and accepted in writing by the Institute, following an inspection, at which time liability shall pass to the Institute.”
National Key Points Act, 1980 (Act No. 102 of 1980)	In terms of the National Key Points Act, 1980 (NKPA), a “National Key Point” is any place or area that has been so declared under section 2 of this Act, if it appears at any time that any place or area is so important that its loss, damage, disruption or immobilisation may prejudice the Republic, or whenever the Minister considers it necessary or expedient for the safety of the Republic or in the public interest he may declare that place or area a National Key Point. The NKPA places certain duties on the owner of such a Key Point and requires the owner to take steps at his/her own expense to the satisfaction of the Minister in respect of the security of the said Key Point. If the said owner without reasonable cause refuses or fails to take the steps specified, he/she shall be guilty of an offence and liable on conviction to a fine not exceeding R20 000.00 or to imprisonment for a period not exceeding 5 years or to both such fine and such imprisonment.
National Nuclear Disaster Management Plan (NNDMP)	The National Nuclear Disaster Management Plan (NNDMP) provides South Africa's overarching framework for preventing, preparing for, responding to, and recovering from nuclear or radiological emergencies that may affect the public. It is mandated under the Disaster Management Act, 2002, and aligned with the Nuclear Energy Act, 1999 and the National Nuclear Regulator Act, 1999. The plan designates the national department responsible for energy (formerly the Department of Minerals and Energy) as the lead national organ of state for coordinating nuclear disaster management. The plan applies to all nuclear and radiological emergencies with potential off-site consequences, including: - Accidents at nuclear installations (e.g. power reactors, research reactors) - Incidents involving radioactive materials during transport or use - Any nuclear event that may impact the public, property, or the environment

Legislation / Policy	Description
	It operates within South Africa's integrated disaster management system, ensuring coordination across national, provincial, and municipal spheres of government, The NNDMP is guided by the following objectives: ■ Protection of life, health, property, and the environment ■ Rapid, coordinated emergency response to minimise radiation exposure ■ Clear allocation of roles and responsibilities among all stakeholders ■ Preparedness and prevention, including planning, training, and exercises Key principles include risk reduction, intergovernmental coordination, compliance with national legislation, and alignment with international nuclear safety standards, including cooperation with the IAEA. The plan clearly defines responsibilities across all role players, including: ■ National Executive and National Disaster Management Centre (NDMC): Overall disaster coordination at national level ■ Minister and Department responsible for Energy: Policy leadership and national coordination of nuclear disaster management ■ Provincial and Municipal Governments: Off-site emergency planning, public protection measures, and local response ■ National Nuclear Regulator (NNR): Regulatory oversight, safety assurance, and emergency preparedness requirements ■ Nuclear Authorisation Holders (e.g. Eskom, NECSA): On-site emergency preparedness, immediate incident response, and technical support ■ Other National Departments (Health, Environment, Police, etc.): Sector-specific response and support functions This multilayered structure ensures end to end management from incident detection through recovery. The NNDMP emphasises advance preparedness, requiring: ■ Approved emergency plans for nuclear installations ■ Coordination agreements between license holders and local authorities ■ Regular training, drills, and exercises ■ Defined emergency procedures, including public communication and protective actions During an emergency, the plan provides for integrated command, control, and communication, ensuring technical nuclear expertise supports disaster management decision making. The plan includes provisions for: ■ Post disaster recovery and rehabilitation ■ Financial arrangements to support response and recovery actions ■ Periodic review and updating of the NNDMP to reflect legislative changes, lessons learned, and evolving risks This ensures the plan remains current and fit for purpose as South Africa's nuclear programme develops.
Nuclear New Build Programme (NNP) specifications	The Nuclear New Build Programme (NNBP) is a South African government programme to procure 2 500 MW of new nuclear electricity generation capacity as part of the country's long-term energy mix. The programme was mandated by Decision 8 of the Integrated Resource Plan (IRP) 2019, which directs that nuclear capacity be implemented "at a pace and scale that the country can afford" as a long-term, low-carbon baseload option. The programme aligns with: ■ The Nuclear Energy Policy (2008) ■ The National Development Plan (NDP 2030) (recognising nuclear as low-carbon baseload)

Legislation / Policy	Description
	■ The Economic Reconstruction and Recovery Plan The IRP 2025 explicitly includes nuclear as part of a balanced and diversified energy mix, alongside renewables, storage and gas. The NNP is therefore policy-consistent, but policy-constrained by the IRP's capacity limits and timing assumptions. The NNBP cannot exceed 5 200 MW unless: ■ the IRP is formally updated, or ■ a new IRP is promulgated Any Section 34 nuclear determination must state that it is "in accordance with the capacity allocated in the IRP" The NNBP is technology-agnostic within defined categories. The Request for Information (RFI) issued by the DMPR tested the market on: ■ Conventional Nuclear Power Plants (NPPs) ■ Small Modular Reactor (SMR) technologies. No specific reactor design, vendor, or technology type is pre-selected in the programme specifications. The NNBP is structured as a multi-stage programme with defined review gateways and milestones, starting with RFI, followed by procurement framework development and feasibility studies. A Nuclear Energy Programme Implementing Office (NEPIO) has been established to support programme coordination and implementation planning. It is important to note that the NNBP establishes policy intent only; it does not authorise sites, construction, or operation. Each nuclear project must still undergo full environmental authorisation, nuclear safety licensing, and public participation.

7.5 NATIONAL ENVIRONMENTAL LEGAL FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in Table 7-8.

Table 7-8 – Applicable National Legislation

Legislation	Description of Legislation	Applicability to NPP
National Environmental Management Act (Act No. 107 of 1998)	NEMA requires, inter alia, that: ■ Development must be socially, environmentally, and economically sustainable. ■ Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied. ■ A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions. NEMA provides that an Environmental Authorisation (EA) is required by any person that intends to undertake certain listed activities that are considered likely to have a detrimental impact on the environment and have been identified in Listing Notice 1 (GN R983, GG 38282 of 4 December 2014), Listing Notice 2 (GN R984, GG 38282 of 4 December 2014), or Listing Notice 3 (GN R985, GG 38282 of 4 December 2014) published	WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in this section are considered applicable to the development: A S&EIR process must be followed. An EA is required and will be applied for with the DFFE.

Legislation	Description of Legislation	Applicability to NPP
	under the Environmental Impact Assessment Regulations (EIA Regulations). No construction/development activities (broadly defined in the EIA Regulations) may commence without an EA being granted by the relevant CA (and/or where such EA has been suspended by virtue of, for example, an appeal having been lodged). The regulations outlining the procedures required for authorisation are published in the EIA Regulations of 2014 (GNR 982) (as amended). Listing Notice 1 identifies activities that require a BA (basic assessment) process to be undertaken, in terms of the EIA Regulations, in order to obtain an environmental authorisation prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&EIR (scoping and environmental impact assessment) process to be undertaken, in terms of the EIA Regulations, in order to obtain an environmental authorisation prior to commencement of that activity. Listing Notice 3 identifies activities within specific high biodiversity areas that require a BA process to be undertaken, in terms of the EIA Regulations, in order to obtain an environmental authorisation prior to commencement of that activity.	
Listing Notice 1: GNR 983	<i>Activity 9 –</i> <i>The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water-</i> <i>(i) with an internal diameter of 0.36 metres or more; or</i> <i>(ii) with a peak throughput of 120 litres per second or more; excluding where-</i> <i>(a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or</i> <i>(b) where such development will occur within an urban area.</i>	The proposed NPP facility will include cooling systems, emergency water supply lines, seawater reservoir or stormwater drainage networks associated with the plant.
Listing Notice 1: GNR 983	<i>Activity 11 –</i> <i>The development of facilities or infrastructure for the transmission and distribution of electricity-</i> <i>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kV; or</i> <i>(ii) inside urban areas or industrial complexes with a capacity of 275 kV or more, excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is –</i> <i>(a) temporarily required to allow for maintenance of existing infrastructure;</i> <i>(b) 2 km or shorter in length;</i> <i>(c) within an existing transmission line servitude; and</i> <i>(d) will be removed within 18 months of the commencement of development.</i>	The proposed NPP Facility will include transmission and distribution infrastructure with a capacity of approximately 132 kV.
Listing Notice 1: GNR 983	<i>Activity 12 –</i> <i>The development of-</i> <i>(i) canals exceeding 100 square metres in size;</i> <i>(ii) channels exceeding 100 square metres in size;</i> <i>(iii) bridges exceeding 100 square metres in size;</i>	A NPP facility may trigger Activity 12 if it involves the development of infrastructure or structures with a physical footprint exceeding 100 square metres within a

Legislation	Description of Legislation	Applicability to NPP
	(iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size; (vi) bulk storm water outlet structures exceeding 100 square metres in size; (vii) marinas exceeding 100 square metres in size; (viii) jetties exceeding 100 square metres in size; (ix) slipways exceeding 100 square metres in size; (x) buildings exceeding 100 square metres in size; (xi) boardwalks exceeding 100 square metres in size; or (xii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; - excluding- (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; or (ee) where such development occurs within existing roads or road reserves.	watercourse, in front of a development setback, or within 32 metres of a watercourse where no setback exists. This is particularly relevant for cooling water intake structures, stormwater outlet systems, bridges, or buildings situated near the sea environment.
Listing Notice 1: GNR 983	Activity 13 – The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	The proposed NPP facility will require storage of water on site.
Listing Notice 1: GNR 983	Activity 14 – The development of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 8016 cubic metres or more but not exceeding 500 cubic metres.	The proposed NPP will store dangerous goods required for construction and operation purposes (e. .diesel, gas, hydrogen) within the specified thresholds. The capacity of the facilities will be confirmed during the design phase.
Listing Notice 1: GNR 983	Activity 16 – The development and related operation of facilities for the desalination of water with a design capacity to produce more than 100 cubic metres of treated water per day.	A proposed NPP facility may trigger Activity 16 if it includes the development and operation of a desalination

Legislation	Description of Legislation	Applicability to NPP
		plant with a design capacity exceeding 100 cubic metres of treated water per day. This is particularly relevant where desalinated water may be required for cooling systems, potable supply, or emergency reserves.
Listing Notice 1: GNR 983	<i>Activity 17 – Development-</i> (i) <i>in the sea;</i> (ii) <i>in an estuary;</i> (iii) <i>within the littoral active zone;</i> (iv) <i>in front of a development setback; or</i> (v) <i>if no development setback exists, within a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater;</i> <i>in respect of-</i> (a) <i>fixed or floating jetties and slipways;</i> (b) <i>tidal pools;</i> (c) <i>embankments;</i> (d) <i>rock revetments or stabilising structures including stabilising walls;</i> (e) <i>buildings of 50 square metres or more; or</i> (f) <i>infrastructure with a development footprint of 50 square metres or more –</i> <i>but excluding-</i> (aa) <i>the development of infrastructure and structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</i> (bb) <i>where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</i> (cc) <i>the development of temporary infrastructure or structures where such structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared; or</i> (dd) <i>where such development occurs within an urban area.</i>	The proposed NPP facility will be developed within the littoral active zone of the western or eastern region of the sea.
Listing Notice 1: GNR 983	<i>Activity 18 –</i> <i>The planting of vegetation or placing of any material on dunes or exposed sand surfaces of more than 10 square metres, within the littoral active zone, for the purpose of preventing the free movement of sand, erosion or accretion, excluding where –</i> (i) <i>the planting of vegetation or placement of material relates to restoration and maintenance of indigenous coastal vegetation undertaken in accordance with a maintenance management plan; or</i> (ii) <i>such planting of vegetation or placing of material will occur behind a development setback.</i>	The proposed NPP facility will be developed within the littoral active zone of the western or eastern region of the sea. Subsequently, placing of any material or vegetation to prevent free movement of sand will occur during the construction and rehabilitation phase.

Legislation	Description of Legislation	Applicability to NPP
Listing Notice 1: GNR 983	<i>Activity 19 A –</i> <i>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-</i> <i>(i) the seashore;</i> <i>(ii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater; or</i> <i>(iii) the sea;- but excluding where such infilling, depositing, dredging, excavation, removal or moving-</i> <i>(a) will occur behind a development setback;</i> <i>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;</i> <i>(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</i>	The proposed NPP will include dredge spoil disposal activities, including a range of disposal options (beach or offshore). The volume of material disposal will be confirmed during the design phase.
Listing Notice 1: GNR 983	<i>Activity 25:</i> <i>The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.</i>	The proposed NPP includes the construction and operation of a sewage treatment facility. The capacity of this facility will be confirmed during the design phase.
Listing Notice 1: GNR 983	<i>Activity 56 –</i> <i>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre—</i> <i>(i) where the existing reserve is wider than 13,5 meters;</i> <i>or</i> <i>(ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.</i>	The Project will entail upgrading of roads leading to the NPP facility area.
Listing Notice 2: GNR 984	<i>Activity 2 –</i> <i>The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more..</i>	The energy source from the NPP facility is classified non-renewable, intended to generate 5 200 MW electricity capacity.
Listing Notice 2: GNR 984	<i>Activity 3 –</i> <i>The development and related operation of facilities or infrastructure for nuclear reaction including energy generation, the production, enrichment, processing, reprocessing, storage or disposal of nuclear fuels, radioactive products, nuclear waste or radioactive waste.</i>	The NPP facility intends to generate 5 200 MW of electricity utilising infrastructure for nuclear reaction. Furthermore, the project will require the storage and disposal of nuclear fuels, radioactive products, nuclear waste and radioactive waste.
Listing Notice 2: GNR 984	<i>Activity 4 –</i>	The proposed NPP will store dangerous goods required for

Legislation	Description of Legislation	Applicability to NPP
	<i>The development of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.</i>	construction and operation purposes (e. .diesel, gas, hydrogen) within the specified thresholds. The capacity of the facilities will be confirmed during the design phase..
Listing Notice 2: GNR 984	Activity 6 – <i>The development of facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding-</i> (i) <i>activities which are identified and included in Listing Notice 1 of 2014;</i> (ii) <i>activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or</i> (iii) <i>the development of facilities or infrastructure for the treatment of effluent, wastewater or sewage where such facilities have a daily throughput capacity of 2000 cubic metres or less.</i>	The proposed NPP facility will involve cooling water discharge, radioactive effluent management, or air emissions from auxiliary system. The proposed NPP includes the construction and operation of a sewage treatment facility.
Listing Notice 2: GNR 984	Activity 15 – <i>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—</i> (i) <i>the undertaking of a linear activity; or</i> (ii) <i>maintenance purposes undertaken in accordance with a maintenance management plan.</i>	Based on the information provided with regards to total project area, with the approximated extents as follows: ■ Thyspunt – 250 hectares ■ Bantamsklip – 170 hectares Therefore, it is assumed that the facilities will result in the clearance of at least 20 hectares or more of indigenous vegetation.
Listing Notice 2: GNR 984	Activity 25: <i>The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of 15 000 cubic metres or more.</i>	The proposed NPP includes the construction and operation of a sewage treatment facility. The capacity of this facility will be confirmed during the design phase.
Listing Notice 2: GNR 984	Activity 26 – <i>Development—</i> (i) <i>in the sea;</i> (ii) <i>in an estuary;</i> (iii) <i>within the littoral active zone;</i> (iv) <i>in front of a development setback; or</i> (v) <i>if no development setback exists, within a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater;</i> <i>in respect of –</i> (a) <i>facilities associated with the arrival and departure of vessels and the handling of cargo;</i>	The proposed NPP facility will be developed within the littoral active zone of the western or eastern region of the sea.

Legislation	Description of Legislation	Applicability to NPP
	(b) piers; (c) inter- and sub-tidal structures for entrapment of sand; (d) breakwater structures; (e) coastal marinas; (f) coastal harbours or ports; (g) tunnels; or (h) underwater channels; but excluding the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour.	
Listing Notice 2: GNR 984	Activity 27 – The development of – (i) a national road as defined in section 40 of the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998); (ii) a road administered by a provincial authority; (iii) a road with a reserve wider than 30 metres; or (iv) a road catering for more than one lane of traffic in both directions; but excluding the development and related operation of a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010, in which case activity 24 in Listing Notice 1 of 2014 applies.	The proposed NPP facility will entail upgrading of roads leading to the NPP facility area. This road design specifications will be confirmed during the design phase.
Listing Notice 3: GNR 985	Activity 2 – The development of reservoirs for bulk water supply with a capacity of more than 250 cubic metres. (b) In Eastern Cape: (i) In an estuarine functional zone; (ii) In a protected area identified in terms of NEMPAA, excluding conservancies; (iii) Outside urban areas, in: (aa) National Protected Area Expansion Strategy Focus areas; (bb) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (cc) Sites or areas identified in terms of an International Convention; (dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ee) Core areas in biosphere reserves; (ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; or	The proposed NPP facility will include cooling systems, emergency water supply lines, seawater reservoir or stormwater drainage networks associated with the plant, with the capacity of more than 250 cubic metres. This activity's applicability is yet to be confirmed.

Legislation	Description of Legislation	Applicability to NPP
	(gg) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or iv. In urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose; or (cc) Areas seawards of the development setback line or within urban protected areas (f) In Western Cape: (i) A protected area identified in terms of NEMPAA, excluding conservancies; (ii) In areas containing indigenous vegetation; or (iii) In urban areas: (aa) Areas zoned for use as public open space; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose.	
Listing Notice 3: GNR 985	Activity 3 – The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15 metres in height – but excluding attachments to existing buildings and masts on rooftops (b) In Eastern Cape: (i) In an estuarine functional zone; (ii) Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area	The proposed NPP facility will include relevant for emergency communication systems, telemetry, or operational control infrastructure that requires standalone towers. The design of the facility will confirm if the structure is not an attachment to an existing building or rooftop. This activity's applicability is yet to be confirmed.

Legislation	Description of Legislation	Applicability to NPP
	<i>identified in terms of NEMPAA or from the core areas of a biosphere reserve; or</i> <i>(hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or</i> <i>iii. Inside urban areas; in:</i> <i>(aa) Areas zoned for use as public open space; or</i> <i>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.</i> <i>(f) In Western Cape:</i> <i>(i) All areas outside urban areas; or</i> <i>(ii) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose, within urban areas.</i>	
Listing Notice 3: GNR 985	<i>Activity 4 –</i> <i>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</i> <i>(b) In Eastern Cape:</i> <i>(i) In an estuarine functional zone;</i> <i>(ii) Outside urban areas, in:</i> <i>(aa) A protected area identified in terms of NEMPAA, excluding disturbed areas;</i> <i>(bb) National Protected Area Expansion Strategy Focus areas;</i> <i>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i> <i>(dd) Sites or areas identified in terms of an International Convention;</i> <i>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i> <i>(ff) Core areas in biosphere reserves;</i> <i>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas; or</i> <i>(hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or</i> <i>(iii) In urban areas:</i> <i>(aa) Areas zoned for use as public open space;</i> <i>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or</i> <i>(cc) Seawards of the development setback line or within urban protected areas.</i>	The proposed NPP facility will entail upgrading of roads leading to the NPP facility area. This road design specifications will be confirmed during the design phase. This activity's applicability is yet to be confirmed.

Legislation	Description of Legislation	Applicability to NPP
	(f) In Western Cape: (i) Areas outside urban areas; (aa) Areas containing indigenous vegetation; (bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or (ii) In urban areas: (cc) Areas zoned for conservation use; or (dd) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.	
Listing Notice 3: GNR 985	Activity 10 – <i>The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</i> Eastern Cape (i) Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 kilometre from the highwater mark of the sea if no such development setback line is determined; (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; (jj) Within 500 metres of an estuarine functional zone, excluding areas falling behind the development setback line; (kk) In an estuarine functional zone, excluding areas falling behind the development setback line; or (ll) Within a watercourse; or (iii) Inside urban areas: (aa) Areas zoned for use as public open space;	The proposed NPP will store dangerous goods required for construction and operation purposes (e. .diesel, gas, hydrogen) within the specified thresholds. The capacity of the facilities will be confirmed during the design phase. This activity's applicability is yet to be confirmed.

Legislation	Description of Legislation	Applicability to NPP
	(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or (cc) Within 500 metres of an estuarine functional zone, excluding areas falling behind the development setback line.	
Listing Notice 3: GNR 985	Activity 12 – The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. (a) In Eastern Cape, Free State, Gauteng, Limpopo, North West and Western Cape provinces: (i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (ii) Within critical biodiversity areas identified in bioregional plans; (iii) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or (iv) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	Based on the information provided with regards to total project area, with the approximated extents as follows: ■ Thyspunt – 250 hectares ■ Bantamsklip – 170 hectares Therefore, it is assumed that the facilities will result in the clearance of at least 20 hectares or more of indigenous vegetation particularly during site preparation, infrastructure expansion, or safety buffer zone establishment.. This activity's applicability is yet to be confirmed.
Listing Notice 3: GNR 985	Activity 14 – The development of- (i) canals exceeding 10 square metres in size; (ii) channels exceeding 10 square metres in size; (iii) bridges exceeding 10 square metres in size; (iv) dams, where the dam, including infrastructure and water surface area exceeds 10 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area exceeds 10 square metres in size; (vi) bulk storm water outlet structures exceeding 10 square metres in size; (vii) marinas exceeding 10 square metres in size; (viii) jetties exceeding 10 square metres in size; (ix) slipways exceeding 10 square metres in size; (x) buildings exceeding 10 square metres in size; (xi) boardwalks exceeding 10 square metres in size; or (xii) infrastructure or structures with a physical footprint of 10 square metres or more;	Based on the information provided with regards to total project area, with the approximated extents as follows: ■ Thyspunt – 250 hectares ■ Bantamsklip – 170 hectares This physical footprint includes buildings and stormwater outlets outside urban areas. This is especially relevant for intake and discharge structures, cooling water systems, or safety-related installations near the sea environments. This activity's applicability is yet to be confirmed.

Legislation	Description of Legislation	Applicability to NPP
	Where such development occurs – (a) within a watercourse; (b) in from of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. (c) In Eastern Cape: (i) In an estuarine functional zone; (ii) Outside urban areas, in: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas identified in terms of an International Convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; or (iii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or iii. In urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or (cc) Areas seawards of the development setback line. (f) In Western Cape: (i) Outside urban areas, in: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;	

Legislation	Description of Legislation	Applicability to NPP
	(ee) Sites or areas listed in terms of an International Convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; or (hh) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.	
Listing Notice 3: GNR 985	Activity 15 – <i>The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010.</i> (c) In Western Cape: (i) Outside urban areas, or (ii) Inside urban areas in: (aa) Areas zoned for conservation use or equivalent zoning, on or after 02 August 2010; (bb) A protected area identified in terms of NEMPAA, excluding conservancies; or (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act as adopted by the competent authority.	The proposed NPP facility involves transforming land larger than 1 000 square metres from a zoning of open space, conservation, or an equivalent designation—to industrial use. This area is considered undeveloped land and is repurposed for nuclear infrastructure. This activity's applicability is yet to be confirmed.
<u>Financial Provision for Remediation of Environmental Damage under the National Environmental Management Act (Act No. 107 of 1998), as amended</u>¹⁷⁰	The National Environmental Management Act (NEMA) provides the overarching legislative framework for financial provision to ensure the rehabilitation and remediation of environmental damage arising from authorised activities. The principal enabling provision is Section 24P, which was substituted in its entirety by the National Environmental Laws Amendment Act (Act No. 2 of 2022), with effect from 30 June 2023. Section 24P of the National Environmental Management Act (Act No. 107 of 1998), as substituted by the National Environmental Laws Amendment Act (Act No. 2 of 2022), requires that applicants for and holders of environmental authorisations make financial provision for progressive rehabilitation, decommissioning, closure and post-closure activities, including the management of latent environmental impacts. Financial provision may be made through a combination of prescribed vehicles, including cash deposits, insurance, financial guarantees, and trust funds, and must be reviewed annually to ensure adequacy. While the Financial Provisioning Regulations (GN R1147 of 2015, as amended) currently operationalise these requirements specifically for	For the proposed NPP, the more directly applicable financial provision obligations are prescribed under the National Nuclear Regulator Act (Act No. 47 of 1999, as amended), through Sections 26A and 29–35, which regulate financial provisioning for decommissioning, rehabilitation, and nuclear damage liability specifically.

¹⁷⁰ Information on Financial provision added as a result of stakeholder comments and queries in this regard.

Legislation	Description of Legislation	Applicability to NPP
	mining and related activities, the enabling provision of Section 24P is not limited to the mining sector and establishes the overarching statutory principle that adequate financial resources must be secured for the mitigation and rehabilitation of adverse environmental impacts arising from any authorised activity.	
Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes (GNR 320, 20 March 2020 and GNR 1150, 30 October 2020)	The protocols provide the criteria for specialist assessment and minimum report content requirements for impacts for various environmental themes for activities requiring environmental authorisation. The protocols replace the requirements of Appendix 6 of the EIA Regulations, 2014, as amended. The assessment and reporting requirements of the protocols are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (screening tool). The Screening Reports were generated for the project on 10/02/2026.	The following environmental themes were applicable to the proposed NPP: ■ Agricultural Impact Assessment ■ Animal Species Assessment ■ Aquatic Biodiversity Impact Assessment ■ Archaeological and Cultural Heritage Impact Assessment ■ Civil Aviation Assessment ■ Defence Assessment ■ Palaeontology Impact Assessment ■ Plant Species Assessment ■ Terrestrial Biodiversity Impact Assessment ■ Landscape/Visual Impact Assessment ■ Marine Impact Assessment ■ Hydrology Impact Assessment ■ Radioactivity Impact Assessment ■ Traffic Impact Assessment ■ Geotechnical Assessment ■ Climate Impact Assessment ■ Socio-Economic Assessment ■ Seismicity Assessment
National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA)	This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation, and in the process gives effect to Section 24 of the constitution, in ensuring an environment that is not harmful to health and wellbeing. The Act also provides for the licensing and control of waste management activities through GNR. 921 (2013): List of Waste Management Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment. This NEM: Waste Act does not apply to Radioactive waste that is regulated by the Hazardous Substance Act, 1973 (Act No. 15 of 1973), the National Nuclear Regulator Act, 1999 (Act No. 47 of 1999), and the Nuclear Energy Act, 1999 (Act No. 46 of 1999); or Waste management licences can only be issued after the process of basic assessment (in relation to activities listed in	Due to the associated components of the Nuclear Power Station, a waste management licence may be required. <u>This will be confirmed during the EIA phase.</u> The Environmental Management Programme (EMPr) that will accompany the EIA Report, will include reasonable measures for the prevention of pollution and good international industry practice (GIIP).

Legislation	Description of Legislation	Applicability to NPP
	Category A), or after the process of scoping and EIA (in respect of Category B activities). Category A activities include recycling and recovery of waste; treatment of waste; disposal of waste on land; and construction, expansion or decommissioning of facilities and associated structures and infrastructure. Under these general heads, different waste-related activities are described in further detail. Activities in Category B are similar in nature with different thresholds and volumes specified. Additionally Category C listed activities relate to the storage, recycling and recovery of waste not listed in Category A or B. In terms of this Category, an applicant must comply with norms and standards and does not have to undertake a basic assessment or scoping and EIA process. It is an offence to contravene or fail to comply with section 20 of the Waste Act or to contravene or fail to comply with a waste management licence. A person convicted of any of these offences is liable to a fine not exceeding R10 million or to imprisonment of up to 10 years, or both. As regards the treatment, processing and disposal of waste, Part 6 of the Act prohibits unauthorised disposal of waste in the following terms: "No person may (a) dispose of waste, or knowingly or negligently cause or permit waste to be disposed of, in or on any land, waterbody (sic) or at any facility unless the disposal of that waste is authorised by law; or (b) dispose of waste in a manner that is likely to cause pollution of the environment or harm to health and well-being." There are however certain exceptions to the prohibition. <u>It can be confirmed that the National Environmental Management: Waste Act (NEM:WA) does not cover the storage and disposal of radioactive waste.</u>	
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) was promulgated in June 2004 within the framework of NEMA to provide for the management and conservation of national biodiversity. NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI). SANBI was established by NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems. The biodiversity assessment identifies Critical Biodiversity Areas (CBAs) which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives.	Based on the preliminary desktop assessment and the Scoping Terrestrial Biodiversity Report, a significant part of the Project Area falls within CBA (1 and 2). Specific management measures for the control of alien and invasive plants will be included in the EMP.
National Biodiversity Offset Guideline (Issued Under Section 24j of the National Environmental Management: Biodiversity Act, 2004)	The National Biodiversity Offset Guideline (2023) is South Africa's first nationally applicable guideline providing a consistent approach to biodiversity offsetting in the environmental authorisation process. It was published by the DFFE under section 24J of the National Environmental Management: Biodiversity Act, 2004.	The requirement for a biodiversity offset has been confirmed. The Biodiversity Offset Strategy will be included in the Draft EIA.

Legislation	Description of Legislation	Applicability to NPP
Environmental Management Act (23 June 2023)	Management Act, 1998 (NEMA) and gazetted on 23 June 2023. The guideline must be read alongside NEMA, the 2014 EIA Regulations, and other section 24J guidelines, and is firmly anchored in the mitigation hierarchy, emphasising that biodiversity offsets are a measure of last resort. The guideline sets out the purpose and principles of biodiversity offsetting, with the overarching objective of achieving no net loss, or preferably a net gain, of biodiversity where significant residual impacts remain after avoidance, minimisation and rehabilitation measures have been exhausted. Core principles include the requirement that offsets be ecologically appropriate, additional, like-for-like (or better), secured for the long term, and capable of being implemented, monitored and enforced. The guideline makes it clear that offsets are not intended to justify unacceptable impacts, but rather to compensate for residual impacts that cannot reasonably be avoided. In practical terms, the guideline provides structured guidance on when biodiversity offsets are required and how offset requirements should be determined as part of an environmental authorisation application. It outlines the steps in the offsetting process, including identifying the need for an offset, determining offset requirements, selecting and securing suitable offset sites, and preparing a Biodiversity Offset Management Plan. It also provides guidance on incorporating offset conditions into environmental authorisations and on concluding Biodiversity Offset Implementation Agreements, clarifying the roles and responsibilities of developers, competent authorities, EAPs and conservation agencies. The guideline applies primarily to terrestrial and freshwater ecosystems and is intended to standardise biodiversity offset practice across South Africa, improving transparency, consistency and accountability in decision-making. Although it is not legally binding, competent authorities are required to consider it when assessing environmental authorisation applications. As such, the National Biodiversity Offset Guideline plays a critical role in integrating biodiversity conservation objectives into development planning and in supporting sustainable development outcomes under NEMA.	
National Environmental Management Protected Areas Act (Act No. 57 of 2003)	The purpose of the National Environmental Management Protected Areas Act (Act No. 57 of 2003) (NEMPAA) is to, inter alia, provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. To this end, it provides for the declaration and management of various types of protected areas, including national parks. Section 50(5) of NEMPAA states that "no development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority."	In January 2025, SAHRA published a Gazette Notice advising of the Provisional Protection of the Thyspunt Site in terms of section 29 of the National Heritage Resources Act (Act 25 of 1999). The Bantamsklip site alternative overlaps with the Groot Hagelkraal Private Nature Reserve.
National Forest Act (Act No. 84 of 1998)	The National Forests Act (Act No. 84 of 1998) (NFA) was promulgated to reform the law on forests. The NFA regulates the protection of certain forests and trees. The NFA provides that a licence or exemption must be obtained in order to:	The plant species assessment will identify whether permits will be required in terms of this Act. This will be confirmed in the EIA Phase.

Legislation	Description of Legislation	Applicability to NPP
	- cut, disturb, damage or destroy (i) any indigenous tree in a natural forest; or (ii) any protected tree; or - possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from (i) an indigenous tree in a natural forest; or (ii) a protected tree.	
The National Water Act (Act No. 36 of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water sources to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria. Section 21 water uses as per the NWA includes: 21(a): Taking water from a water resource; 21(b): Storing water; 21(c): Impeding or diverting the flow of water in a watercourse; 21(d): Engaging in a stream flow reduction activity; 21(e): Engaging in a controlled activity; 21(f): Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit; 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource; 21(h): Disposing in any manner of water which contains waste from, or which has been heated in any industrial or power generation process; 21(i): Altering the bed, banks, course or characteristics of a watercourse; 21(j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and 21(k): Using water for recreational purposes.	Eskom would be required to apply for a Water Use Licence when site selection process and technology selection have been completed. The WUL process is not included in the Scope of the EIA process and will be undertaken as a separate process. The list of water uses applicable to the proposed Project include: - Taking water from a water resource; - Storing water - Impeding or diverting the flow of water in a watercourse; - Disposing of waste in a manner which may detrimentally impact on a water resource; - Disposing in any manner of water which contains waste from, or which has been heated in any industrial or power generation process - Altering the bed, banks, course or characteristics of a watercourse; The DWS will make the final decision on water uses that are applicable to the project through a pre-application meeting after which a Water Use Authorisation Application (WULA) as determined by the Risk Assessment will be undertaken in compliance with procedural regulations published by the DWS within General Notice 267 (GN267). These regulations specify required information per water use and the reporting structure of required supporting technical information.

Legislation	Description of Legislation	Applicability to NPP
Water Services Act (Act No. 108 of 1997)	The Water Services Act (Act No. 108 of 1997) (WSA) regulates the supply of water services by water services authorities and water services providers. According to section 6 of the WSA, no person may use water supply and sanitation services from a source other than a water services provider nominated by the water services authority (such as a municipality) having jurisdiction in the area in question, without the approval of that water services authority. The definition of “water services” in the WSA includes “water supply services” and “sanitation services”. Furthermore, in terms of section 7 of the WSA, A person may not obtain water for industrial use from any source other than the distribution system of a water services provider nominated by the water services authority having jurisdiction in the area in question, without the approval of that water services authority. The WSA defines “industrial use” so as to mean “the use of water for mining, manufacturing, generating electricity, land based transport, construction or any related purpose”. In terms of water services institutions, the WSA aims to provide a regulatory framework and associated financial assistance mechanisms for water services institutions and water services intermediaries, provide for water services development plans while also setting structures in place to establish and disestablish water boards and water services committees, and their powers and duties. Furthermore, the WSA allows for the monitoring of water services and intervention by the Minister or by the relevant Provincial authority where necessary.	If it is identified that the Project will receive water from a source other than from a municipal system then the WSA may be triggered, i.e. if the project will require water for construction and/or operational purposes from a borehole, then the municipality will have to provide its written authorisation. .
The National Heritage Resources Act (Act No. 25 of 1999)	The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA) and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. Part 2 of NHRA details specific activities that require a Heritage Impact Assessment (HIA) that will need to be approved by SAHRA. Section 38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including the construction of a road, exceeding 300m in length. In accordance with the NHRA, an independent heritage consultant is to conduct a cultural heritage assessment to determine any impact on any sites, features or objects of cultural heritage significance. If none are identified, any archaeological sites or graves to be exposed during construction work must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. If a permit is required as per section 34 of the NHRA, no works are to commence before the permit is obtained.	Parts of Section 35, 36 and 38 apply to the proposed project, principally: ■ Section 35 (4) – No person may, without a permit issued by the responsible heritage resources authority- • destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; • destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite. ■ Section 38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

Legislation	Description of Legislation	Applicability to NPP
		any development or other activity which will change the character of a site— (i) exceeding 5 000 m2 in extent, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. The archaeological investigations at both study sites have concluded that both areas contain highly significant shell middens, fish traps and shipwrecks. These sites are limited to a narrow coastal band of up to 500 m from the high water mark with Thyspunt holding further archaeological sites on the open dunes about 1.2 km further inland of the coast. Archaeologically, there is little to separate the two sites from each other and a Grade IIIA coastal buffer has been recommended at both project sites. An additional Grade IIIB inland dune buffer has also been recommended at Thyspunt. Hart additionally conducted a widespread test excavation programme in the mid-area between the sensitive coastal strip and the open dunefield which found that very little archaeological material is present between 500 m to 1.2 km from the shoreline. At Bantamsklip, the vegetation cover is not nearly as dense as Thyspunt and it was possible to verify the large drop in archaeological sensitivity beyond 300 m inland of the shoreline via foot surveys. Both project sites therefore have an inland zone setback from the shoreline that will have a low impact on archaeological resources. . The proposed project will be loaded onto the SAHRIS

Legislation	Description of Legislation	Applicability to NPP
		portal for comment by the SAHRA. Should any heritage sites be unearthed during excavations, a permit would be required to be obtained from SAHRA/ ECPHRA/ HWC. Furthermore, SAHRA/ ECPHRA/ HWC will be a commenting authority on the proposed NPP.
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	The aim of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) is to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. Section 53(1) of the MPRDA provides that any person who intends to use the surface of any land in any way that may be contrary to any object of the MPRDA, or which is likely to impede any such object, must apply to the Minister of Mineral Resources (the Minister) for approval. Section 53 of the MPRDA provides a mechanism for ensuring that, inter alia, the mining of mineral resources is not detrimentally affected through the use of the surface of land and which may, for example, result in the sterilisation of a mineral resource. The Amendment Regulations (GNR 420 of 27 March 2020) introduced a template for section 53 applications (Form Z) and the specific information that applicants will need to provide as part of a section 53 application.	It is currently understood that the MPRDA and the requirement for a Section 53 permit will not be application to the NPP
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act No. 73 of 1989)	In South Africa, environmental noise control has been in place for three decades, beginning in the 1980s with codes of practice issued by the South African National Standards (formerly the South African Bureau of Standards, SABS) to address noise pollution in various sectors of the country. Under the previous generation of environmental legislation, specifically the Environmental Conservation Act 73 of 1989 (ECA), provisions were made to control noise from a National level in the form of the Noise Control Regulations (GNR 154 of January 1992). In later years, the ECA was replaced by the National Environmental Management Act 107 of 1998 (NEMA) as amended. The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) was published in line with NEMA and contains noise control provisions under Section 34: 1) <i>The minister may prescribe essential national standards –</i> a) <i>for the control of noise, either in general or by specific machinery or activities or in specified places or areas; or</i> b) <i>for determining –</i> i. <i>a definition of noise; and</i> ii. <i>the maximum levels of noise.</i> 2) <i>When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards.</i>	An Acoustic Assessment is being undertaken for the NPP and any mitigation measures required will be included in the EMPr.

Legislation	Description of Legislation	Applicability to NPP
	Under NEMAQA, the Noise Control Regulations were updated and are to be applied to all provinces in South Africa. The Noise Control Regulations give all the responsibilities of enforcement to the Local Provincial Authority, where location specific by-laws can be created and applied to the locations with approval of Provincial Government. Where province-specific regulations have not been promulgated, acoustic impact assessments must follow the Noise Control Regulations. Furthermore, NEMAQA prescribes that the Minister must publish maximum allowable noise levels for different districts and national noise standards. These have not yet been accomplished and as a result all monitoring and assessments are done in accordance with the South African National Standards (SANS) 10103:2008 and 10328:2008. The SANS 10328:2008 (Methods for Environmental Noise Impact Assessments) presently inform environmental acoustic impact assessments in South Africa. This standard defines that the purpose of an Environmental Acoustic Impact Assessment is to determine and quantify the acoustical impact of, or on, a proposed development. It also stipulates the methods used to assess impacts as well as the minimum requirements to be investigated and included in the Environmental Acoustic Impact Assessment report as part of the EIA. The SANS 10103:2008 document (The measurement and rating of environmental noise with respect to speech communication) provides methods and guidelines to assess working and living environments with respect to acoustic comfort as well as respect to possible annoyance by noise. As applicable to this assessment, the SANS 10103 provides the typical rating levels for noise in different districts.	
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	The Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) provides for the implementation of control measures for soil conservation works as well as alien and invasive plant species in and outside of urban areas. In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. Various Acts administered by the DFFE and the DWS, as well as other laws (including local by-laws), spell out the fines, terms of imprisonment and other penalties for contravening the law. Although no fines have yet been placed against landowners who do not remove invasive species, the authorities may clear their land of invasive alien plants and other alien species entirely at the landowners' cost and risk. Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983 - CARA). A consent in terms of CARA is required for the cultivation of virgin land. Cultivation is defined in CARA as "any act by means of which the topsoil is disturbed mechanically". The purpose of this consent for the cultivation of virgin land is to ensure that only land that is suitable as arable land is cultivated. Therefore, despite the above definition of cultivation, disturbance to the topsoil that results from construction of infrastructure does not constitute cultivation as it is understood in CARA. This has been corroborated by Anneliza Collett (Acting Scientific Manager: Natural Resources Inventories and Assessments in the Directorate: Land and Soil Management of the Department of	An Alien and Invasive Species Management Plan will be included in the EMPr during the EIA Phase.

Legislation	Description of Legislation	Applicability to NPP
	Agriculture, Land Reform and Rural Development (DALRRD)). The construction and operation of the facility will therefore not require consent from the Department of Agriculture, Land Reform and Rural Development in terms of this provision of CARA.	
Subdivision of Agricultural Land Act (Act 70 of 1970)	The Subdivision of Agricultural Land Act 70 of 1970 regulates and restricts the subdivision and use of agricultural land in South Africa. Its primary purpose is to prevent the creation of uneconomic or non-viable farming units and to protect agricultural land as a national resource The core principle of the Act is that No agricultural land may be subdivided, sold in portions, leased long-term, or have rights granted over a portion without the prior written consent of the Minister responsible for agriculture. Key provisions of the Act include: - Ministerial consent required for: - Subdivision of agricultural land - Sale or transfer of a portion of agricultural land - Sale or transfer of an undivided share - Long-term leases (generally 10 years or more) over a portion of agricultural land - Definition of agricultural land excludes land within proclaimed municipal areas and certain other statutory areas, unless declared agricultural land by the Minister. - Exemptions apply in limited circumstances, including: - Transfers to the State or statutory bodies - Certain successions, contracts, surveys, or leases that existed before the Act came into operation on 2 January 1971 - Non-compliance may render transactions void and expose parties to penalties. Although the Act was formally repealed by the Subdivision of Agricultural Land Act Repeal Act 64 of 1998, the repeal has not been brought into operation, meaning Act 70 of 1970 remains in force	Eskom may well be exempt from any requirement in this regard. This will be confirmed in the EIA Phase
Preservation and Development of Agricultural Land Act (Act 39 of 2024)	The Preservation and Development of Agricultural Land Act 39 of 2024 (PDALA) establishes a national regulatory framework for the preservation, protection, sustainable use, and development of all agricultural land in South Africa. It is intended to replace the fragmented approach under the Subdivision of Agricultural Land Act and related measures, while strengthening food security and long-term agricultural viability. The purpose and objectives of the Act include: - Preserve agricultural land as a scarce and non-renewable national resource - Prevent fragmentation and loss of high-value agricultural land - Promote viable, sustainable farming units - Support food security and inter-generational equity - Coordinate agricultural land governance across national and provincial spheres The key features of the Act include:	This Act is not yet applicable.

Legislation	Description of Legislation	Applicability to NPP
	- Applies to all agricultural land in the Republic, regardless of zoning or location - Introduces agricultural land evaluation and classification systems based on agricultural potential - Provides for Provincial Agricultural Sector Plans, aligned with national norms and standards - Allows for the declaration of Protected Agricultural Areas, limiting conversion to non-agricultural uses - Establishes agro-ecosystem management and authorisation requirements for listed activities affecting agricultural land - Creates a National Agro-Eco Information System to support land-use decisions and monitoring - Provides for inspectors, compliance directives, offences, penalties, and appeal procedures The Act was assented to on 20 December 2024 and published in the Government Gazette on 29 January 2025. However, the Act has not yet commenced; commencement will occur on a date proclaimed by the President. Once this Act comes into operation it will replace SALA paving the way for a modernised and integrated agricultural land regime, but it is not yet known when it will come into operation	
Environment Conservation Act (Act No. 73 of 1989)	The Environment Conservation Act (No 73 of 1989) (ECA) requires that any person who constructs works for the supply of light, heat or power by means of electricity, must notify electronic communications network service licensees of the proposed works; provide such licensees with a plan of the proposed works and any further information that may be required; and comply with any requirements imposed by such licensees.	Section 29 of the ECA, 1989 formed part of the Act's enforcement framework by creating criminal offences for contraventions of the Act and its regulations, including failures to comply with prohibitions or conditions relating to activities with potential environmental impacts. While the Act has largely been superseded by the NEMA, Section 29 remains relevant in respect of legacy compliance and enforcement matters arising during the period in which the Environment Conservation Act was in force
Electronic Communications Act, 2005 (Act No. 36 of 2005)	The Electronic Communications Act, 2005 (Act No. 36 of 2005) establishes South Africa's unified legal framework for the regulation of electronic communications by promoting convergence across the telecommunications, broadcasting and broadcasting signal distribution sectors. It provides for the licensing and regulation of electronic communications network services, electronic communications services and broadcasting services, vests regulatory oversight in the Independent Communications Authority of South Africa (ICASA) and governs matters such as access to and use of the radio frequency spectrum, competition, universal service and access obligations, and consumer protection. The Act replaced the previously fragmented telecommunications regime, repealed the Telecommunications Act, 1996, and enables a technology-neutral, market-oriented system intended to support infrastructure deployment, innovation and equitable access to communications services	Section 29(1)(b) of the ECA provides that electronic communications network service licensees (e.g., Vodacom, MTN, ICASA...) must be notified at least 30 days prior to commencement of construction. These stakeholders are included in the Stakeholder Database and have been notified of the project.

Legislation	Description of Legislation	Applicability to NPP
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) provides South Africa's primary legislative framework for the protection and management of air quality. It reforms earlier air-pollution law to align with the principles of sustainable development, environmental protection, and cooperative governance. The purpose and objectives of the Act are as follows: - Protect and enhance the quality of ambient air in the Republic - Prevent air pollution and ecological degradation - Promote ecologically sustainable development while allowing justifiable social and economic development - Establish national norms and standards for air quality monitoring, management, and control across all spheres of government The following key features of the Act should be noted: - Introduces ambient air quality standards and emission standards to protect human health and the environment - Provides for air quality management planning at national, provincial, and municipal levels, including Air Quality Management Plans (AQMPs) - Enables the declaration of Priority Areas where air quality standards are exceeded or at risk, requiring targeted intervention - Establishes listed activities that result in significant atmospheric emissions and requires an Atmospheric Emission Licence (AEL) for such activities - Allows the declaration of priority air pollutants (including GHGs) and the imposition of pollution prevention plans [- Provides for compliance monitoring, inspections, offences, and penalties.	The following is relevant to the NPP: Listed activity Sub-category 2.4 - Storage of Petroleum Product is triggered by the Diesel Storage tanks (storage capacity of more than 1 000 m³). An AEL will be required should the diesel storage tanks have a capacity of more than 1 000 m³. Emissions reporting will be required in this regard during the operational phase of the NPP. Dust control regulations promulgated in November 2013 will require the implementation of a Dust Management Plan, to be included in the EMPr during the EIA Phase.
Sea-Shore Act, 1935 (Act No. 21 of 1935)	The Sea-Shore Act, 1935 (Act No. 21 of 1935) was enacted to establish state ownership and control over South Africa's seashore and adjacent marine areas. Its primary purpose was to declare the Governor General (later the State President, and now the State) as the owner of the seashore, as well as the sea and seabed within the territorial waters (originally defined as within the three mile limit). By vesting ownership in the State, the Act created a uniform legal framework for managing coastal areas that were previously subject to fragmented or uncertain control. The Act further empowered the State to regulate the use, occupation, and development of the sea-shore and seabed. It authorised the granting of leases, permits, or other rights for activities such as construction, public works, and infrastructure, while also allowing for the alienation (sale or transfer) of portions of the sea-shore under controlled conditions. These powers were intended to balance public access and enjoyment of the coast with economic and developmental uses, subject to ministerial oversight and, in certain cases, consultation with local authorities. Over time, the Sea-Shore Act was amended multiple times and its functions were progressively reshaped by later environmental and constitutional developments. Ultimately, it was repealed to the extent not already assigned to provinces by the National Environmental Management: Integrated	The Sea-Shore Act, 1935 is applicable to the NPP as it will be located on, or require use of, the sea-shore or seabed. In which case, state ownership and permitting provisions governed access, construction, and occupation, will be subject to later environmental legislation.

Legislation	Description of Legislation	Applicability to NPP
	Coastal Management Act 24 of 2008, which now provides the principal legislative framework for coastal governance in South Africa. Despite this, the Sea-Shore Act remains historically significant as the foundational statute that asserted state custodianship over the country's coastal and marine zones.	
National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008)	The National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) (NEM:ICMA) establishes South Africa's overarching framework for the integrated management of the coastal and estuarine environment. Its primary objective is to promote the conservation of coastal ecosystems while ensuring that development and the use of natural resources within the coastal zone are socially, economically, and ecologically sustainable. The Act gives effect to constitutional environmental rights and aligns coastal governance with national environmental management principles. A central feature of the Act is the definition and regulation of the coastal zone, including coastal public property, the coastal protection zone, and estuaries. It clearly sets out rights and duties in relation to coastal areas, secures public access to the coast, and allocates responsibilities among national, provincial, and municipal authorities. The Act also repealed the Sea-Shore Act, 1935 to the extent that it had not already been assigned to provinces, modernising the legal regime governing coastal land and waters. The Act introduces integrated planning and cooperative governance mechanisms, including national, provincial, and municipal coastal management programmes, to ensure coordinated decision making across all spheres of government. It provides for the protection and management of estuaries, special management areas, and coastal resources, recognising the interconnected ecological, social, and economic functions of the coast. In addition, the Act regulates coastal development and pollution control, including prohibitions on incineration at sea, controls on dumping and discharge of waste, and measures to prevent inappropriate or harmful development within the coastal zone. Through these provisions, the Integrated Coastal Management Act establishes a comprehensive, precautionary, and participatory system for safeguarding South Africa's coastal environment for present and future generations Section 16 of the NEM:ICMA defines the "Coastal Protected Zone". This zone includes, amongst others, the following: <i>(b) any part of the littoral active zone that is not coastal public property;</i> <i>(c) any coastal protection area, or part of such area, which is not coastal public property;</i> <i>(d) any land unit situated wholly or partially within one kilometre of the high-water mark which, when this Act came into force—</i> <i>(i) was zoned for agricultural or undetermined use; or</i> <i>(ii) was not zoned and was not part of a lawfully established township, urban area or other human settlement;</i> <i>(e) any land unit not referred to in paragraph (d) that is situated wholly or partially within 100 metres of the high-water mark;</i>	The NEM:ICMA applies to the NPP as it is proposed to be constructed and operated within the coastal zone. In this case, coastal development controls, pollution prevention measures, and permitting requirements apply to ensure protection of coastal public property and marine ecosystems. Section 16(d)(i) would affect the Thyspunt site, which is zoned as "Agricultural Zone 1". A Coastal Water Discharge Permit in terms of section 69 will be required. A permit in terms of Section 71 may also be required due to the dumping of spoil material at sea.

Legislation	Description of Legislation	Applicability to NPP
	(f) any coastal wetland, lake, lagoon or dam which is situated wholly or partially within a land unit referred to in paragraph (d)(i) or (e) (g) any part of the seashore which is not coastal public property, including all privately owned land below the high-water mark; (h) any admiralty reserve which is not coastal public property: or (i) any land that would be inundated by a 1:50 year flood or storm event. Section 63 requires that where a coastal activity needs and EA under NEMA, the competent authority must consider a comprehensive set of environmental, social, and planning factors before granting approval. These include public and stakeholder inputs, the applicant's compliance history, and the potential impacts on coastal public property, the coastal protection zone, and coastal access land. The authority must also assess alignment with applicable coastal management instruments (e.g. coastal management programmes and estuarine management plans), as well as the socio-economic consequences of approving or refusing the activity. Importantly, the section emphasises avoiding developments that cause irreversible environmental damage, conflict with coastal protection objectives, or are vulnerable to dynamic coastal processes, unless justified and mitigated. Overall, Section 63 ensures that coastal developments are environmentally sustainable, socially justified, and consistent with coastal management objectives, with a strong emphasis on protecting sensitive coastal areas for present and future generations.¹⁷¹ Section 63 effectively requires a multi-disciplinary coastal EIA, with specialist studies covering coastal processes, ecology, socio-economics, hydrology, spatial planning alignment, Terrestrial biodiversity (dune systems, vegetation, fauna), and Sensitive habitat mapping, to demonstrate that the proposed activity is sustainable, justified, and compatible with coastal management objectives. Section 69(6)(c) determines that a person who discharges effluent in coastal waters "must discharge effluent subject to any condition contained in the relevant authorisation" and section 69(6)(d) determines that a person who discharges effluent into coastal waters "must comply with any applicable waste standards or water management practices prescribed under this Act or under section 29 of the National Water Act or any Act of Parliament specifically dealing with waste, unless the conditions of the relevant authorisation provide otherwise". Section 69 will be affected as spoil might be hydraulically pumped offshore, where it will be discarded into the sea (according to the marine biologist, discarding of a small portion of spoil that would affect only 3 km² is permissible at the sites,	

¹⁷¹ Section 63 added as a result of stakeholder comment.

Legislation	Description of Legislation	Applicability to NPP
	since movement patterns in the sea would allow for sufficient dilution of the spoil, provided that the recommended depth of disposal and pumping rates are adhered to). The discharge of effluent originating from a source on land into coastal waters (which includes internal waters, territorial waters and estuaries) without an authorisation or permit in contravention of section 69. The NEM:ICMA expressly refers to the anticipated rise in sea-level by establishing a coastal buffer zone inland of the high-water mark, within which activities will be controlled and certain activities will be prohibited. A further measure implemented by the NEM:ICMA to respond to sea-level rise, is the establishment of so-called coastal set-back lines. Set-back lines are to be established in order to prohibit or restrict the building, erection, alteration or extension of structures that are wholly or partially towards the seaward side of such a coastal set-back line. These measures provide government with the power to prevent development that is too close to the sea-shore and will therefore mitigate the effects of possible sea-level rise. The NEM:ICMA further contains a provision regarding possible changes in the position of the high-water mark. It states that if the high-water mark moves inland due to erosion of the coast, sea-level rise or other natural causes, the owner of land situated inland of the high-water mark loses ownership of any portion of that land that becomes situated below the high-water mark and will not be entitled to compensation for the loss of property. Section 6(1) of the NEM:ICMA states that, in the event of there being conflict between a section of the Act and other national legislation, the section of the Act will prevail, if the conflict concerns coastal zone management. Section 6(2) of the NEM:ICMA further states that a provision of either the Act or NEMA (or any regulation made under the NEM:ICMA or NEMA) will prevail over any provision of any Act that was not repealed in terms of the provisions of the Act.	
The Maritime Zones Act, 1994 (Act No. 15 of 1994)	The Maritime Zones Act, 1994 (Act No. 15 of 1994) (MZA) establishes South Africa's maritime zones in accordance with international law, particularly the United Nations Convention on the Law of the Sea. Its primary purpose is to define the legal extent of the Republic's internal waters, territorial waters, contiguous zone, exclusive economic zone (EEZ), and continental shelf, and to regulate the application of South African law within those zones. The Act sets the low-water line as the baseline from which maritime zones are measured, while also allowing for the use of straight baselines in specified coastal areas. It declares territorial waters extending up to 12 nautical miles, a contiguous zone up to 24 nautical miles, and an EEZ up to 200 nautical miles from the baseline. Within these zones, the Republic exercises varying degrees of sovereignty and jurisdiction, including rights over natural resources, marine scientific research, and environmental protection. In addition, the Act defines the continental shelf in line with international law and provides for the regulation of installations, pipelines, and other activities on or above the seabed. It also amends related maritime legislation to ensure consistency	The Maritime Zones Act, 1994 will apply to the NPP only if it is located within South Africa's internal waters, territorial waters, exclusive economic zone, or on the continental shelf. In such cases, the Act determines jurisdiction, regulatory authority, and applicable maritime controls.

Legislation	Description of Legislation	Applicability to NPP
	across South Africa's marine governance framework. Overall, the Maritime Zones Act forms the cornerstone of South Africa's modern legal regime for asserting and managing its maritime rights and responsibilities. The MZA stipulates that the Republic may take whatever measures are necessary in the sea (or the airspace above it) to protect the coastline from pollution or the threat of pollution. Regarding offshore installations, the MZA stipulates that all the laws of the Republic, including the common law, apply to such installations. This would include those laws applying to marine pollution.	
Marine Living Resources Act, 1998 (Act No. 18 of 1998)	The Marine Living Resources Act, 1998 (Act No. 18 of 1998) establishes South Africa's primary legal framework for the conservation and sustainable use of marine living resources. Its core objective is to protect the marine ecosystem while ensuring the long-term, sustainable utilisation of marine species and equitable access to their exploitation for the benefit of all South Africans. The Act applies within South Africa's territorial waters and exclusive economic zone and replaces earlier fisheries legislation. The Act provides for structured management of fisheries and marine resources, including the determination of total allowable catches, allocation of fishing rights, licensing of vessels, and regulation of subsistence, recreational, and commercial fishing. It introduces principles such as precautionary management, ecosystem-based approaches, and transformation of the fishing industry to address historical inequities. Dedicated administrative bodies and enforcement mechanisms are established to ensure compliance and effective governance. In addition, the Marine Living Resources Act enables the declaration and management of marine protected areas and regulates activities that may harm marine biodiversity. It provides enforcement powers, offences, and penalties to safeguard marine resources and aligns South African marine management with international environmental and fisheries obligations. Overall, the Act represents a comprehensive shift toward sustainable, inclusive, and conservation-driven marine resource management. Section 43 of the MLRA provides for the declaration of marine protected areas. Certain actions, such as fishing, taking of any resources, fauna and flora other than fish, dredging, extraction of gravel or sand, disturbance or alternation of the natural environment and construction of buildings are prohibited in such areas.	The Marine Living Resources Act, 1998 applies to the NPP as its construction and operation will affect marine living resources within South Africa's territorial waters or exclusive economic zone. In such cases, activities must avoid harm to marine ecosystems and comply with conservation and environmental protection requirements. The Thyspunt site is located a relatively long way from its nearest MPA, approximately 60 km from the Tsitsikamma MPA. The Bantamsklip site is 25 km south of the Walker Bay MPA.
Marine Spatial Planning Act (Act 16 of 2018)	The Act is built on the National Framework for Marine Spatial Planning (MSP) in South Africa (2017), which provides guidance on MSP on the national level. It specifies the objectives of MSP and outlines the process. The objectives of the Marine Spatial Planning Act (Act 16 of 2018) include the development and implementation of a shared marine spatial planning system to manage a changing environment that can be accessed by all sectors and users of the ocean, the conservation of the ocean for present and future generation and the facilitation of responsible use of the ocean. Where there is a conflict between existing uses, developing uses or activities, maximum coexistence of uses or activities should be	This Act is considered applicable to the NPP due to its location on the coastline.

Legislation	Description of Legislation	Applicability to NPP
	preferred wherever possible, but where such coexistence is not possible, the principles in Section 5(1) must be applied to resolve such conflict. Building on the Marine Spatial Planning Act and the National Framework for Marine Spatial Planning in South Africa, DFFE published the Proposed Approach to Spatial Development and Management for South Africa's Marine Planning Areas in 2019. The document translates the overarching vision and high-level directions for developing South Africa's ocean space into a spatial management system. This document specifically provides for a "zoning scheme" system, which defines categories of sea use that inform the Draft marine sector plans (published for public comment in March 2023).	
Sea Birds and Seals Protection Act (Act 46 of 1973)	This legislation explicitly prohibits the harassment or unnecessary disturbance of seabirds and also bans the killing, capture, or deliberate disturbance of these birds. The South African Policy on the Management of Seals, Seabirds, and Shorebirds (2007) commits the government to developing action plans aimed at reducing incidental mortality of seabirds, seals, and shorebirds caused by fishing operations.	Mitigation and management measures to ensure the unnecessary disturbance of seabirds and seals will be included in the EMP in the EIA Phase.
Civil Aviation Act (Act No. 13 of 2009)	Civil aviation in South Africa is governed by the Civil Aviation Act (Act 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by South African Civil Aviation Authority (SACAA) as an agency of the Department of Transport (DoT). SACAA achieves the objectives set out in the Act by complying with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organisation (ICAO), while considering the local context when issuing the South African Civil Aviation Regulations (SA CARs). As of the 1st of May 2021, Air Traffic and Navigation Services (ATNS) has been appointed as the new Obstacle application Service Provider for Windfarms and later Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and in due time all Power Plant assessments.	In terms of Section 91.06.20 of the Civil Aviation Regulations of 2011, promulgated in terms of the Civil Aviation Act, the Director (of the SACAA) may declare an area as a restricted air space. The Nuclear Power Station will be declared as a national key point and as such the air space above the power station will be restricted. According to the DFFE Screening Tool Report, the Thyspunt site is regarded as having medium sensitivity with regards to civil aviation, with civil aviation aerodromes between 8 and 15km from the site. Paradise Beach Airfield FAPX is situated 15km to the north-east of the project boundary.. According to the DFFE Screening Tool Report, the Bantamsklip site is regarded as having high sensitivity with regards to civil aviation, due to the presence of dangerous and restricted airspace as demarcated. Pearly Beach Airstrip (ZA-0192) is located 14km from the project boundary. This is a small private airstrip with one runway.

Legislation	Description of Legislation	Applicability to NPP
		An Application for the Approval of Obstacles will potentially be required to be submitted to ATNS. SACAA and ATNS have been included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought from these authorities as applicable.
Occupational Health and Safety Act (Act No. 85 of 1993)	The Occupational Health and Safety Act 85 of 1993 (OHSA) is South Africa's primary framework legislation for regulating workplace health and safety. Its core purpose is to ensure the health and safety of persons at work, as well as to protect members of the public from hazards arising from work activities, including the use of plant and machinery. The Act applies broadly across all sectors and workplaces and is enforced by the Department of Employment and Labour through inspections, directives, and prosecutions. [gov.za], [gov.za] The Act places the primary responsibility for occupational health and safety on employers, who must, as far as is reasonably practicable, provide and maintain a working environment that is safe and without risk to health. This includes identifying hazards, assessing and managing risks, providing safe systems of work, ensuring the safe use of machinery and substances, and supplying appropriate information, training, and supervision. Employees also have duties to take reasonable care for their own safety and that of others and to comply with lawful safety instructions. OHSA establishes an institutional and regulatory system to support compliance, including the appointment of inspectors with wide powers of entry and enforcement, the establishment of an Advisory Council for Occupational Health and Safety, and the issuing of regulations that address specific risks and industries (such as construction, machinery, and major hazard installations). The Act further requires the reporting and investigation of certain incidents and provides for offences and penalties where duties are breached, reinforcing its preventative and protective objectives.	The National Occupational Health and Safety Act (No. 85 of 1993) (OHSA) and the relevant regulations under the Act are applicable to the proposed project. This includes the Construction Regulations promulgated in 2014 under Section 43 of the Act. Adherence to South Africa's OHSA and its relevant Regulations is essential. The Occupational Health and Safety Act 85 of 1993 applies to a nuclear power plant in respect of general workplace health and safety, requiring the operator to protect employees and the public from occupational hazards, while nuclear and radiological safety risks are regulated separately under nuclear specific legislation administered by the National Nuclear Regulator.
MHI Regulations, 2022	The Major Hazard Installation (MHI) Regulations, issued under the Occupational Health and Safety Act 85 of 1993, regulate establishments where dangerous substances are present in quantities that could cause major incidents such as fires, explosions, or toxic releases that may affect employees, the public, property, or the environment. The current MHI Regulations, 2022 (effective from 2023) replaced the 2001 regulations and introduce a risk based framework aligned with international standards, including the UN Globally Harmonised System and South African standards SANS 1461 (quantitative risk assessment) and SANS 1514 (emergency planning). Establishments are classified as low, medium, or high hazard based on the type and quantity of dangerous substances present, and the regulations apply to new, existing, modified, permanent, and temporary installations.	The MHI Regulations apply to a nuclear power plant only insofar as non-nuclear dangerous substances are present, while nuclear safety is regulated separately under the National Nuclear Regulator Act. The MHI regulations may find relevance to the ancillary infrastructure proposed such as the gas and hydrogen plant

Legislation	Description of Legislation	Applicability to NPP
	The regulations impose clear duties on operators (duty holders), including notification and registration with authorities, conducting risk assessments by an Approved Inspection Authority, preparing a Major Incident Prevention Policy, submitting Safety Reports (for higher-risk installations), maintaining on-site and off-site emergency plans, and obtaining a Licence to Operate where required. They also require employee training, public and stakeholder information-sharing, and incident and near-miss reporting, while assigning responsibilities to local government for land-use planning and emergency preparedness around MHIs. Non-compliance constitutes an offence and may result in significant fines or imprisonment, underscoring the regulations' focus on preventing catastrophic industrial accidents and protecting surrounding.	
National Protected Area Expansion Strategy, 2018	The National Protected Area Expansion Strategy 2018 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2018).	According to the DFFE screening tool, there are areas within the Bantamsklip study area that have been identified as priority areas for inclusion in future protected areas. According to the NPAES (2018), large portions of habitat in the Bantamsklip study area have been mapped as Priority Focus Areas for protected area expansion. According to the DFFE Screening tool there are no NPAES areas associated with the Thyspunt study area.
Key Biodiversity Areas	Key Biodiversity Areas (KBAs) in South Africa are sites of global importance for the persistence of biodiversity, identified because they support threatened species, geographically restricted species, important ecological processes, or irreplaceable habitats. KBAs span terrestrial, freshwater, estuarine, and marine environments and are recognised under the internationally agreed Global Standard for the Identification of Key Biodiversity Areas published in 2016. They provide a science-based way to prioritise places that are most critical for conserving biodiversity. In South Africa, the KBA programme is led by the South African National Biodiversity Institute (SANBI) and BirdLife South Africa, supported by a national KBA Coordination Group comprising government, academic, and civil society experts. The identification process is inclusive and consultative, applying globally standardised criteria to national biodiversity data. South Africa is notable for being the first country to apply all KBA criteria comprehensively across taxa and ecosystems. KBAs do not automatically confer legal protection, but they play a critical role in conservation planning, environmental impact assessment, and land-use decision-making. They complement national planning tools such as Critical Biodiversity Areas by providing internationally recognised site-based evidence to guide development, conservation investment, and policy. As such, KBAs are an essential	The Bantamsklip site overlaps with the Agulhas Coast KBA. Agulhas Coast is a largely protected terrestrial site in the Western Cape, South Africa. It includes low mountains, rolling hills and plains dominated by fynbos shrublands, mainly <i>proteoid</i> and <i>ericaceous</i> fynbos, with <i>restioid</i> fynbos occurring locally. Near the coast, vegetation shifts to dune fields with taller, closed evergreen shrublands (up to ~4 m) in moist, sheltered areas and shorter coastal thicket (up to ~1 m) in many places. Wet bottomlands are dominated by <i>Leucadendron linifolium restioid</i> fynbos, transitioning to Agulhas Sand Fynbos where sands deepen. The Thyspunt site overlaps with the Garden Route KBA.

Legislation	Description of Legislation	Applicability to NPP
	foundation for safeguarding South Africa's most valuable biodiversity assets for future generations.	This site qualifies as a Key Biodiversity Area of international significance that meets the thresholds for 3 criteria described in the Global Standard for the Identification of KBAs. Based on the available information, 168 species meet one or more KBA criteria for this site. The KBA trigger species at this site include amphibians, birds, butterflies, dragonflies, fish, plants, and reptiles.
Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013)	The Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013), commonly referred to as SPLUMA, is South Africa's framework legislation for spatial planning and land use management. It was enacted to create a uniform, coherent and inclusive system for planning and land-use decision-making across the national, provincial and municipal spheres of government, addressing the fragmentation and inequities caused by past planning laws. The Act came into operation on 1 July 2015 and provides the legal basis for aligning spatial planning with constitutional imperatives, particularly the right to an environment that is not harmful to health and well-being. SPLUMA establishes a set of core development principles that must guide all spatial planning and land-use decisions, including spatial justice, spatial sustainability, spatial efficiency, spatial resilience and good administration. These principles are intended to redress historical spatial imbalances, protect environmental and ecological systems, promote efficient use of land and infrastructure, and ensure transparent, accountable decision-making. The Act also clearly defines the roles and responsibilities of each sphere of government, with municipalities designated as the primary authorities for land-use management and development control within their areas of jurisdiction. In practical terms, SPLUMA introduces and regulates key planning instruments such as Spatial Development Frameworks (SDFs) at national, provincial and municipal levels, municipal land use schemes applicable to entire municipal areas, and Municipal Planning Tribunals responsible for deciding development applications. It requires that land-use planning be integrated with environmental management legislation, including NEMA, ensuring that development decisions support sustainable development outcomes. As such, SPLUMA plays a central role in guiding infrastructure, energy and major development projects alongside environmental authorisation processes in South Africa.	For a NPP, SPLUMA governs land-use rights, zoning, and spatial alignment, requiring consistency with municipal Spatial Development Frameworks and land-use schemes, and ensuring the project supports sustainable, efficient and environmentally responsible spatial development.
Hazardous Substances Act, 1973 (Act No. 15 of 1973)	The Hazardous Substances Act, 1973 (Act No. 15 of 1973) provides the legislative framework for the control and regulation of substances that may pose risks to human health or safety due to their toxic, corrosive, irritant, sensitising, flammable, or pressurised nature. The Act classifies hazardous substances and certain electronic products into four groups (Groups I–IV) according to their degree of danger, and	The Hazardous Substances Act, 1973 applies to a nuclear power plant in respect of the control, licensing, handling, storage, and disposal of hazardous substances, including Group IV radioactive

Legislation	Description of Legislation	Applicability to NPP
	regulates their importation, manufacture, sale, use, handling, storage, modification, disposal, and dumping. Its primary objective is to prevent injury, ill health, or death arising from exposure to such substances through a system of prohibitions, controls, and licensing. The Act further establishes administrative and enforcement mechanisms, including the appointment of inspectors with powers to enter premises, seize substances, and enforce compliance. It provides for licensing and registration requirements, appeals against regulatory decisions, and penalties for non-compliance. Certain provisions relating to radioactive materials (Group IV substances) have been amended and partially superseded by later nuclear-specific legislation, but the Act remains a foundational statute governing hazardous substances management in South Africa and continues to apply alongside more specialised regulatory regimes.	materials where applicable, while nuclear safety and radiological protection are primarily regulated under specialised nuclear legislation administered by the National Nuclear Regulator.
Transportation of Dangerous Goods and Substances	Chapter VIII of the National Road Traffic Regulations promulgated under the National Road Traffic Act, 1996 (Act No. 93 of 1996) provides clarity on the obligations related to the transportation of dangerous goods and substances by road.	As all the raw materials and waste materials (hazardous and non-hazardous) will be transported to and from the site by road, the nuclear power station is obliged to comply with the laws governing such transportation.
Municipal Systems Act, 2000 (Act No. 32 of 2000)	The Municipal Systems Act, 2000 (MSA) specifies that municipalities must draw up an IDP as a single, inclusive and strategic development plan that must be aligned with other municipalities and other spheres of government. Section 26 of the MSA specifies that certain requirements must be adhered to in the drafting of an IDP, including that an IDP must reflect – - the vision for the long term development of the municipality with special emphasis on the municipality's most critical development and internal transformation needs; - the council's development strategies which must be aligned with any national or provincial sectoral plans and planning requirements binding on the municipality in terms of legislation; and - applicable disaster management plans. The Municipal Planning and Performance Management Regulations¹⁸⁹ (promulgated in terms of the MSA) set out further requirements for an IDP which include making provisions for: - Development initiatives including infrastructure, physical, social and institutional development; and - all known projects, plans and programmes to be implemented within the municipality by any organ of state.	The Municipal Systems Act, 2000 (Act No. 32 of 2000) applies to a nuclear power plant by governing municipal planning, service delivery, community participation, and integrated development planning where the facility interacts with municipal functions, while not regulating nuclear safety, which remains subject to national nuclear legislation.
Municipal Finance Management Act, 2003 (Act No. 56 of 2003)	IDPs must also comply fully with the Municipal Finance Management Act, 2003 (MFMA), which came into effect on 1 July 2004. Section 21(1) of the MFMA requires that municipalities co-ordinate the processes for preparing the annual budget and reviewing its IDP, to ensure that the municipality's tabled budget and revisions of the IDP are mutually consistent and credible. The introduction of the MFMA, therefore, provides for closer alignment between the	The Municipal Finance Management Act, 2003 (Act No. 56 of 2003) applies to a nuclear power plant indirectly, regulating municipal budgeting, procurement, revenue, and infrastructure financing where municipalities

Legislation	Description of Legislation	Applicability to NPP
	setting of the annual budget and the compilation of the annual IDP. The annual process of drafting the budget and IDP documents should be synchronised so as to take into account changes and revisions in both documents and the effect of any changes and revisions in one process on the outcomes of the other. Section 53(1) of the MFMA provides for this, specifically that municipalities should "... co-ordinate the annual revision of the integrated development plan in terms of section 34 of the Municipal Systems Act and the preparation of the annual budget and determine how the integrated development plan is to be taken into account or revised for the purposes of the budget".	provide services, approve capital contributions, or enter agreements related to the plant, ensuring sound financial governance and accountability.

7.6 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK

Table 7-9 summarised key provincial and municipal plans as an outline of the governance framework for the project.

Table 7-9 – Provincial and Municipal Plans

Applicable Plan	Description of Plan
Eastern Cape	
Eastern Cape Vision 2030 Provincial Development Plan (PDP)	Reference is made to Strategic action 4.3.2: Ensure adequate energy infrastructure for household and public facility access, of the Eastern Cape PDP, as follows: - There are still vast areas in rural Eastern Cape where households do not have access to electricity. It will take an estimated eight to nine years before the province has universal electricity access for existing dwellings. When new dwellings are included, it will take an estimated 15 to 20 years to address the combined backlogs in the province. - New investments in the electricity transmission and distribution networks are required to accommodate new generation capacity and strengthen grid capacity. This will improve network performance, network flexibility and the quality of supply for both economic and social activities. The following interventions are proposed: - Ensure universal access to energy by 2030: Alleviate energy poverty and resultant socioeconomic consequences in remote rural areas through sustainable energy initiatives. Economics may dictate that off-grid solutions are necessary. Renewable energy hubs for remote rural areas are a potential solution, using solar, wind and biomass/biogas as a resource. Promote energy-efficient homes to improve health and well-being, but also enable the adequate, affordable provision of energy services to communities. - Increase network capacity available for household use and free basic electricity: New investments in the transmission and distribution networks are needed to meet the current and future demand for household electricity and free basic electricity for indigent households, particularly in the OR Tambo, Alfred Nzo regions, and parts of Amathole.

Applicable Plan	Description of Plan
	Eskom's plans to strengthen the transmission grid with a new high voltage transmission line (Eros) between KwaZulu-Natal and Eastern Cape should be expedited. - Promote energy efficiency. Although provincial government has an indirect role in terms of influencing and promoting energy efficiency among energy consumers, it can: - Send a clear message to consumers by setting energy-efficiency targets. - Support local government in promoting and enforcing energy efficiency. - Enforce energy-efficiency standards when developing new provincial infrastructure. - Give preference in the province's facilities rental procurement policy to energy-efficient facilities. - Develop efficient permission and planning processes for developers and promote clear planning guidelines, particularly for municipalities. - Promote pilot and demonstration projects. - Set an example by implementing energy efficiency within its own facilities, development projects and other spheres of influence. Furthermore, the PDP includes reference to nuclear power generation as follows: - Strategic action 1.1.6: Position the province as a key investment hub in the energy sector and ensure reliable energy supply to high-potential sectors. The province is positioning itself as an investment hub in the energy sector (wind farms, imported liquefied natural gas, shale-gas and nuclear energy). This will provide opportunities to develop the capital goods sector and heavy industries. This new investment could become a major catalyst for provincial economic development, particularly if the benefits and costs are well managed. - Strategic action 1.2.3: Use infrastructure investment to promote more equitable regional development. New infrastructure investment is crucial for shaping regional development. Each of the eight regions has at least one mega-project in the pipeline. Sarah Baartman District Municipality (then Cacadu DM) is referenced for a nuclear plant.
Provincial Parks Board Act (Eastern Cape) (Act 12 of 2003)	The Provincial Parks Board Act, 2003 (Eastern Cape) (Act No. 12 of 2003) establishes the Eastern Cape Provincial Parks Board and provides the legal framework for the conservation and management of biodiversity within provincial parks in the Eastern Cape. The Act sets out the objectives, application, and governance structure of the Board, aligning provincial conservation efforts with national environmental management principles and applicable norms and standards. The Act confers broad powers and functions on the Board, including the declaration, withdrawal, and management of provincial parks, the preparation and implementation of park management plans, and the regulation of access, activities, and land use within these protected areas. It also provides for co-management arrangements, performance monitoring, and the enforcement of restrictions on activities that may harm biodiversity, such as hunting, damage to fauna or flora, and unauthorised commercial use. In addition, the Act regulates land acquisition and rights related to provincial parks, allowing the Province or the Board to acquire land or cancel certain rights to support conservation objectives. It establishes financial, administrative, and supervisory mechanisms to ensure accountability and effective oversight by the responsible Member of the Executive Council (MEC). Overall, the Act forms the cornerstone of provincial protected area governance in the Eastern Cape.
Nature and Environmental Conservation Ordinance (Eastern Cape), 19 of 1974	The Nature and Environmental Conservation Ordinance, 1974 (Ordinance No. 19 of 1974) is a foundational piece of conservation legislation originally enacted for the former Cape of Good Hope and later assigned to the Eastern Cape Province. Its primary purpose is to consolidate and amend laws relating to nature and environmental conservation, establishing a comprehensive legal framework for the

Applicable Plan	Description of Plan
	protection and sustainable management of biodiversity and natural resources within the province. The Ordinance also established a dedicated conservation authority and advisory structures to oversee its implementation. The Ordinance provides detailed measures for the establishment and management of nature reserves, as well as broader conservation controls applicable outside protected areas. It regulates the protection of wild animals (other than fish), rhinoceroses, fish in inland waters, and indigenous flora, including provisions for the listing and protection of endangered and protected species. Activities such as hunting, capturing, selling, or damaging protected fauna and flora are prohibited or strictly controlled, generally requiring permits, licences, or written authorisation from the competent provincial authority. In addition, the Ordinance includes enforcement and permitting mechanisms covering professional hunters, hunting contractors, problem animal control, and other regulated activities. It empowers authorities to issue licences, set hunting seasons and bag limits, declare protected areas, and take action against harmful or invasive species. Although aspects of the Ordinance have been supplemented or superseded by later national environmental legislation, it remains an important legal instrument governing biodiversity conservation in the Eastern Cape.
Eastern Cape Land Development Objectives Regulations	The Eastern Cape Land Development Objectives Regulations were issued to give effect to provincial land-use and development planning by establishing clear objectives to guide spatial development, land use change, and subdivision of land within the Eastern Cape. The Regulations aim to promote orderly, sustainable, and equitable development by ensuring that land development aligns with broader provincial planning frameworks, environmental management principles, and municipal planning instruments. They are intended to address historical spatial imbalances while supporting efficient infrastructure provision and economic development. A core function of the Regulations is to integrate land development decision-making with spatial planning tools, such as provincial and municipal spatial development frameworks (SDFs) and integrated development plans (IDPs). The Regulations emphasise the need to consider environmental constraints, agricultural potential, infrastructure capacity, and socio-economic impacts when assessing land development proposals. By setting development objectives, they guide authorities in evaluating whether proposed land uses are appropriate, compatible with surrounding uses, and consistent with long-term spatial visions. Overall, the Eastern Cape Land Development Objectives Regulations provide a policy-driven framework for managing land development applications in a coherent and transparent manner. While they do not replace municipal land-use controls, they influence how land development is planned and approved by ensuring alignment with provincial priorities, environmental sustainability, and cooperative governance across spheres of government.
Eastern Cape Conservation Plan 2020	The Eastern Cape Conservation Plan 2020, formally referred to as the Eastern Cape Biodiversity Conservation Plan (ECBCP 2019/2020), is a provincial-scale spatial biodiversity plan developed to identify and map critical biodiversity areas (CBAs) and ecological support areas (ESAs) across the Eastern Cape. It represents a comprehensive revision of the earlier 2007 plan, incorporating updated land-cover data, improved biodiversity datasets, refined ecological process mapping, and alignment with national biodiversity planning standards. The plan provides a consistent, science-based framework for understanding biodiversity priorities across terrestrial and freshwater environments. A key objective of the Plan is to guide land-use planning and decision-making by indicating where biodiversity must be conserved, where limited development may be compatible with ecological functioning, and where transformation should be avoided. The ECBCP identifies networks of priority areas and ecological corridors that sustain ecosystem processes, species persistence, and landscape connectivity. It is designed to inform provincial and municipal spatial development frameworks, environmental

Applicable Plan	Description of Plan
	impact assessments, and sectoral planning, rather than to regulate activities directly at site level. Importantly, the Eastern Cape Conservation Plan 2020 does not confer legal protection on its own but serves as an authoritative decision-support tool for government, developers, and environmental practitioners. It must be applied alongside finer-scale biodiversity sector plans, protected-area legislation, and environmental authorisation processes. By integrating biodiversity priorities into development planning, the Plan supports a balanced approach to conservation, economic development, and sustainable land use in the Eastern Cape.
Sarah Baartman District Development Model (DDM) ('One Plan' for Sarah Baartman) (2025)	The DDM serves as an operational framework to enhance cooperative governance and build a capable, ethical, and developmental state. It promotes collaboration among the three spheres of government and state entities, ensuring better coordination, accountability, and impact-driven service delivery. The model is designed to help the state effectively address the triple challenges of poverty, unemployment, and inequality. Infrastructure planning will begin with audits, community engagements, and mapping of bulk needs, alongside waste management improvements and urgent road repairs. By 2030, waste systems, internet connectivity, and renewable energy integration will advance. By 2050, the district aims to achieve major infrastructure upgrades, expanded internet penetration, new road and rail networks, and a stable power supply. The electricity sector experienced the highest growth in 2024 at 3.1%, while it recorded the lowest growth of -7.4% in 2020. When looking at the number of households with no electrical connection over time, in 2009 the households without an electrical connection in the municipality was 22 600, this decreased annually at -9.16% per annum to 8 660 in 2019. In a poor district like Sarah Baartman, the increasing costs of electricity will have a negative impact for businesses and households. The long-term goal is for bulk, upgrading of infrastructure, streetlights, high mast, and conversion to prepaid. A strong economic foundation will be built through key policies, investment strategies, and support mechanisms for SMMEs, the informal sector, and priority sectors such as the oceans economy and renewable energy. By 2030, investment levels, broadband access, and business participation are expected to grow. By 2050, the district envisions a thriving economy with expanded SMMEs, increased women, youth, and disability-owned enterprises, improved infrastructure, and broader digital connectivity.
Kouga IDP (2024–2025 and 2025–2026)	In Kouga, the current IDP cycle and associated process plans explicitly prioritise reliability of municipal services, infrastructure upgrades (roads, wastewater, electricity) and reducing reliance on constrained supply, indicating a policy environment focused on security of supply and enabling new generation and grid-supporting infrastructure within the municipal area. According to the IDP, the municipality is the registered electricity supply authority for the towns of Humansdorp, Jeffreys Bay, St. Francis Bay, Cape St. Francis, and Oyster Bay. In each of these towns, bulk electricity supply is sourced from the Eskom grid. The municipality is responsible for maintaining the internal distribution networks under NERSA's approved EC 108 licence. The Municipality is responsible for constructing, operating, and maintaining the electrical distribution network, providing service delivery to residential, commercial, and industrial consumers within these towns. Additionally, the municipality supplies and maintains street lighting and pump stations with electricity. The electricity related challenges faced by the municipality include the following: ■ Staff: Critical shortage with skilled and experienced staff. ■ Vehicles: Shortage of effective and efficient vehicles to perform the duties especially access to difficult terrain. ■ Training: Technology change constantly and staff need to be skilled to keep up with the latest technology and to be in compliance.

Applicable Plan	Description of Plan
	■ Vandalism and cable theft: Safety and security to be prioritised. Costly infrastructure damage occurs regularly resulting in extended power failures and environmental pollution. ■ Loadshedding: Critical to manage to prevent network damage, this requires great human resources, as a result, fatigue occur amongst staff. It also causes higher than average faults and network failures. ■ Regulatory requirements: The department is regulated and require the necessary regulatory requirements to be adhered to. ■ Office Accommodation: The department staff is scattered; proper coordination cannot be maintained due to staff separation. ■ Infrastructure development: Infrastructure does not receive the necessary upgrades due to budget allocations, higher budget allocations to be provided in order to upgrade networks. The second strategic target of the IDP is to incrementally implement its renewable energy strategy with its main objective of avoiding load shedding and saving money on expensive Eskom electricity tariffs. The main project of this strategy is the construction of a 20 MW solar plant in Humansdorp. Kouga aims to become a renewable energy hub for South Africa. The IDP also highlights that the Thyspunt site, west of Cape St Francis has been acquired by Eskom for possible future power generation purposes. As a result, the Kouga Coast Sub-Regional Structure Plan was prepared based on the need to maintain the viability of the Thyspunt site for possible future nuclear power generation. The Kouga Municipality SDF takes into cognisance the spatial impact of this megaproject in the pipeline and a phased approach towards state of readiness is thus required from a forward planning point of view should this project become a reality. The IDP also focuses on creating a conducive environment for investment and LED by broadening stakeholder participation in economic activities and focusing on SMME development and leveraging local environmental assets to attract investment and foster sustainable livelihoods.
Kouga Local Municipality SDF (2020)	The Kouga Municipal SDF defines Kouga's spatial policies, environmental and coastal management parameters, and implementation mechanisms under Spatial Planning and Land-Use Management (SPLUMA), thereby setting out where and how major infrastructure can be integrated with settlement and environmental systems. The SDF sets policy for integration of major infrastructure with settlement systems and ecological assets, and, together with Kouga's current IDP, prioritises service reliability and systemic upgrades—key determinants of desirability for firm, grid-supporting capacity and associated transmission works. According to the SDF, the formal areas in the municipality has access to electricity and street lighting, and the informal areas have access to electricity, street lighting or high mast lights. 86.9% of households have access to electricity. In terms of electrical services, the following key issues have been identified through the IDP process: ■ There are major challenges in electricity services. ■ Upgrade of infrastructure (primary network) to meet demand and finding the necessary funds through grants etc. is required. ■ Master planning and stringent programmes to implement upgrading measures is needed. ■ A review of augmentation levy (contribution by new developments and existing consumers requiring upgrading of their supplies to augment the primary network) and consumptions tariffs to meet capital programme to upgrade infrastructure. ■ The Kouga Municipality has adequate capacity to deliver electricity in the short term but the following main electricity infrastructure network, the 66Kv overhead line between Eskom's Melkhout Substation at Humansdorp and the Municipality's Main Intake Substation at Jeffreys Bay need attention. The SDF specifically identifies the Thyspunt site as a possible future nuclear power generation site. The SDF states the following:

Applicable Plan	Description of Plan
	The Thyspunt site, west of Cape St Francis has been acquired by Eskom for possible future power generation purposes. As a result, the Kouga Coast Sub-Regional Structure Plan was prepared based on the need to maintain the viability of the Thyspunt site for possible future nuclear power generation. With respect to the Thyspunt site, the following land use principles apply: ■ To ensure the viability if the Thyspunt site for future possible power generation, development of the surrounding areas must be carefully managed. ■ Any proposed changes to current land uses, in terms of standard rezoning procedures within the 16km monitoring and emergency zone, must be brought to the attention of Eskom Nuclear Sites Department at Koeberg Nuclear Power Station, for their consideration and comment. ■ Urban expansion of Oyster Bay and Umzamowethu, which falls within the 0-5km zone should not be permitted. ■ The provision of a small school (without a hostel) to cater for local children may be supported in Oyster Bay. ■ Institutional land uses such as prisons, old age homes and hospitals that may result in the concentration of a resident population should not be developed within 16km of the Thyspunt site, because of potential evacuation difficulties. ■ No new food processing plants to be allowed to be developed within the 16km. ■ Agricultural activities to be monitored within 16km.
Draft (Kouga) Municipal Spatial Development Framework (MSDF) Review (2024/2025)	According to the MSDF, the municipality has been the forerunner for the establishment of renewable energy projects, with specific reference to wind farms. Various projects are under construction or still subject to planning and bid processes in terms of the Renewable Energy Independent Power Producer Programme (REIPPP). These projects currently contribute significantly to the economy in the province and to renewable energy provision towards the national grid. Further development in renewable energy on a large scale will require the expansion and upgrading of Eskom's bulk infrastructure, as the infrastructure is at full capacity. In terms of electricity demand in the St Francis area, the projected maximum electricity demand of 5.46 MVA will strain existing supply networks and require upgrades in distribution capacity, substations, and load management systems. The growth in housing, commercial services, and tourism-related developments will further increase electricity consumption, making energy efficiency and renewable integration key considerations for future planning. Furthermore, the MSDF specifically identifies the Thyspunt site as a possible future nuclear power generation site and highlights several requirements that should be adhered to in the Thyspunt area and surrounds. These are as follows: THYSPUNT NUCLEAR POWER STATION Development within the 16km monitoring and emergency zone of the Thyspunt site must be carefully managed to ensure the long-term viability of the site for possible future nuclear power generation. The following guidelines should be adhered to when considering new developments in this area: COMPLIANCE WITH REGULATORY AND ENVIRONMENTAL REQUIREMENTS ■ All development proposals within the 16km zone must comply with National, Provincial, and Local legislative frameworks, including environmental impact assessments (EIAs), land-use approvals, and nuclear safety regulations. ■ Any rezoning applications or changes in land use must be submitted to Eskom Nuclear Sites Department (Koeberg Nuclear Power Station) for review and comment before approval. RESTRICTIONS ON URBAN EXPANSION AND RESIDENTIAL DEVELOPMENT ■ Oyster Bay and Umzamowethu (0-5km zone): Urban expansion is to be restricted to prevent increasing population density near the nuclear site. ■ No institutional land uses (e.g., prisons, hospitals, old age homes) should be developed within 550m of the Thyspunt site due to potential evacuation difficulties. ■ Limited educational facilities: A small school (without a hostel) may be allowed in Oyster Bay to serve local children, but large institutions should be avoided.

Applicable Plan	Description of Plan
	- The development of new residential estates or settlements within the high-risk zone should be strongly discouraged to minimise evacuation challenges in the event of an emergency. INDUSTRIAL AND AGRICULTURAL LAND USE MANAGEMENT - No new food processing plants should be developed within 550m of the site to ensure food safety and contamination control. - Agricultural activities within 550m of the site should be monitored to assess potential risks related to radiation exposure or contamination. - Industrial and commercial developments within the 16km zone should prioritise non-sensitive land uses that do not attract large, permanent populations or require high-risk infrastructure. INFRASTRUCTURE AND SUPPORTING LAND USES - Future bulk infrastructure planning should consider the potential development of the Thyspunt nuclear site, ensuring that water, electricity, and transport networks are sufficiently robust to accommodate both the power facility and surrounding communities. - Supporting land uses such as worker housing, social facilities, and service industries should be planned carefully, ensuring they are located at safe distances from the nuclear site while still supporting the regional economy. ENVIRONMENTAL AND DISASTER RISK CONSIDERATIONS - Development should align with international safety protocols for nuclear sites, including buffer zones, emergency evacuation routes, and environmental conservation measures. - Sensitive ecosystems in the coastal and wetland areas surrounding Thyspunt must be protected to avoid long-term environmental degradation.
St Francis Bay Central Business District (CBD) Local Spatial Development Framework (LSDF), 2nd Draft (Draft for Discussion and Public Participation Purposes), Report 1799E/04, May 2024	According to the St Francis LSDF: - There are small sections of electrical distribution networks in St Francis Bay that requires remedial work and upgrading. - St Francis Bay has a notified demand of 5 MVA, while the actual demand is 6.195 MVA, with no surplus available. - Cape St Francis has a notified demand of 0.9 MVA, while the actual demand is 1.611 MVA, with no surplus available. - The reticulation in Sea Vista needs to be upgraded to avoid losses. There is a need to apply for increased capacity.
Kouga Local Municipality Draft Service Delivery and Budget Implementation Plan (SDBIP) 2025/2026	In terms of municipal planned delivery, key performance indicators include: Limit unaccounted electricity to less than 16% as of 30 June 2026. Provide free basic electricity to indigent households in terms of approved tariffs earnings.
Kouga Local Municipality Integrated Economic Growth Strategy 2024-2028	The Strategy recognises that inclusive economic growth can contribute to the alleviation of existing poverty and inequality as well as the improvement of livelihoods for current and future generations. The Strategy therefore represents a continuing commitment to growth that will be supported by an ongoing programme of implementation. Additional growth to earn more revenue from external markets requires the implementation of following key interventions: - Retain large existing exporting businesses - Promote Aquaculture-, Fishing-, and Food processing sectors; - Tourism growth; - Attract new industrial investors by creating a more enabling environment; - Increase local enterprise share of local markets; - Support local SMME to access more opportunities;

Applicable Plan	Description of Plan
	■ Credible vocational skills development and tertiary education available; ■ A complex set of stakeholders that need to collaborate. The municipality identifies the sustainable electricity as a threat (SWOT analysis). The Municipality does not have a plan that determines the optimal energy mix for energy sustainability, highlighting that the plan should include various sources of energy generation types. The municipality thus recognised the need for the development of an Electricity Infrastructure Maintenance Plan and an Electricity Infrastructure Master Plan, with a potential solution of utilising technology to address the reduction / efficiency in electricity distribution.
Sarah Baartman District IDP 3rd Review (2025–2026)	The IDP emphasises infrastructure coordination, economic development and resilience, establishing the policy platform for inter-municipal projects with significant grid, transport and skills impacts. The IDP highlights disaster risk reduction, infrastructure reliability and economic resilience, which are directly relevant to the evaluation of strategic energy infrastructure with long operating lives and high availability requirements. Goal (Impact Area) 2: An Enabling Infrastructure Network prioritises sustainable energy and electricity provision. Access to electricity has increased from 87,3% in 2011 to 95,2% in 2022. Although most of the communities of most Local Municipalities have direct access to electricity, a significant capital outlay is envisaged in order to upgrade both the urban and rural networks. To ensure rapid economic development by providing electricity to all communities, the municipality aims to develop an Electricity Master Plan (EMP). The municipality however notes that the provision of bulk electricity to the sparsely populated interior remains expensive. A strategic priority in the municipality includes LED initiatives. This will be achieved through targeted investment promotion to grow strategic sectors that are able to create employment opportunities on a substantial scale in the short to medium term, and more advanced industries that are crucial for long term economic growth. Specific sectors earmarked for further development in the district include: ■ Green economy (including, but not limited to renewable energy and ecosystem services) ■ Tourism ■ Skills development and Education (predominantly, but not exclusively further education and training) ■ Agriculture and agro-processing The district will spearhead the facilitation of intervention within these strategic sectors in the areas of: ■ Identification and appropriate packaging and promotion of investment opportunities. ■ Targeted support to SMMEs to broaden economic participation ultimately assimilate emerging enterprises into developing and established value chains. ■ Investment in enabling infrastructure and the promotion of infrastructure connectivity required for economic growth and development.
Western Cape	
Western Cape Land Use Planning Act, 2014 (Act 3 of 2014)	The Western Cape Land Use Planning Act, 2014 (Act 3 of 2014) is the provincial legislation that regulates spatial planning and land-use management within the Western Cape. It was enacted to consolidate and modernise pre-existing provincial planning laws and to align land-use planning in the province with the constitutional allocation of municipal planning powers and the national framework established by SPLUMA. The Act provides a coherent system for provincial, regional and municipal planning, and came into operation from 1 July 2015, with phased implementation across municipalities.

Applicable Plan	Description of Plan
	The Act establishes a hierarchy of Spatial Development Frameworks (SDFs) at provincial, regional and municipal levels, and sets minimum norms and standards to ensure consistency and coordination between these planning instruments. It clearly defines the respective roles of the provincial government and municipalities, with municipalities responsible for day-to-day development management through zoning schemes and land-use decisions, while the province exercises an oversight, support and regulatory role. The Act also introduces land-use planning principles, including sustainability, spatial efficiency and protection of agricultural land, which must guide all planning and development decisions in the province. In practical terms, the Western Cape Land Use Planning Act regulates municipal and provincial development management, including rezoning, subdivision, consolidation and departures, and provides mechanisms for exemptions, authorisations and appeals. It ensures that land-use decisions are integrated with broader spatial planning objectives and environmental considerations, promoting orderly, sustainable development across urban and rural areas of the Western Cape. As such, the Act is central to land-use approvals and infrastructure planning, operating alongside SPLUMA and environmental legislation such as NEMA within the province.
Draft Western Cape Biodiversity Bill, 2023	The Draft Western Cape Biodiversity Bill, 2023 was published to strengthen and modernise the legal framework for biodiversity conservation and sustainable use within the Western Cape Province. The Bill builds on existing national biodiversity legislation and provincial conservation practice, seeking to give clearer effect to the province's responsibilities in protecting its globally significant biodiversity, maintaining ecosystem services, and promoting ecological resilience in the face of development pressures and climate change. It aligns provincial biodiversity governance with international obligations and contemporary conservation principles. A central focus of the Bill is to provide institutional and legal support for biodiversity planning tools, including the Western Cape Biodiversity Spatial Plan. It introduces mechanisms to integrate biodiversity considerations into land-use planning and development decision-making, ensuring that critical biodiversity areas and ecological support areas are identified, safeguarded, and managed appropriately. The Bill also strengthens the role of the provincial conservation authority in coordinating biodiversity management, advising decision-makers, and overseeing compliance. Overall, the Draft Western Cape Biodiversity Bill, 2023 aims to create a coherent, enforceable provincial biodiversity regime that balances conservation with sustainable economic development. While not yet enacted at the time of drafting, it signals a shift toward more proactive biodiversity protection, clearer spatial planning guidance, and improved alignment between environmental regulation, development planning, and climate resilience strategies in the Western Cape. [gov.za]
Western Cape Biodiversity Sector Plan 2023	The Western Cape Biodiversity Sector Plan 2023, formally issued as the Western Cape Biodiversity Spatial Plan (WCBSP) 2023, is a province-wide biodiversity planning tool developed by CapeNature in accordance with the Western Cape Biodiversity Act, 2021 (Act 6 of 2021). Its primary purpose is to identify and map priority biodiversity areas across terrestrial, freshwater, and coastal environments, using a systematic, science-based approach. The Plan replaces earlier biodiversity sector plans and provides the most up-to-date spatial representation of biodiversity priorities in the province. The Plan delineates Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), as well as protected areas and other natural areas, each with defined desired management objectives. CBAs represent areas that are essential for meeting biodiversity targets and should remain in a natural or near-natural state, while ESAs are areas required to support ecological processes such as water flow, species movement, and climate resilience. Accompanying land-use guidelines explain how these categories should be considered in spatial planning, environmental assessment, and land-use management decisions.

Applicable Plan	Description of Plan
	The Western Cape Biodiversity Sector Plan 2023 does not create new legal protection on its own, but it is a formally adopted planning instrument that must be taken into account by authorities when preparing spatial development frameworks, assessing development applications, and conducting environmental authorisations. By mainstreaming biodiversity considerations into development planning, the Plan plays a central role in balancing conservation priorities with sustainable economic development across the Western Cape. [capenature.co.za], [gov.za]
Western Cape Provincial Spatial Development Framework	The Western Cape Provincial Spatial Development Framework (PSDF) is the overarching spatial planning policy of the Western Cape Government, providing a long-term, province-wide framework to guide where and how development should occur. It gives spatial expression to national and provincial development agendas, including the National Development Plan, and seeks to address historical spatial inequality, inefficient settlement patterns, and environmental constraints. The PSDF serves as a coordinating framework to align public investment, infrastructure delivery, and land-use decision-making across all spheres of government. A core purpose of the PSDF is to promote sustainable, inclusive, and resilient spatial development by directing growth to areas with the greatest potential for economic opportunity, service access, and infrastructure efficiency, while safeguarding critical agricultural land and ecological infrastructure. It supports the development of compact, integrated settlements, improved regional accessibility, and stronger urban-rural linkages. The framework identifies key functional regions, development corridors, and settlement hierarchies to guide strategic planning and investment decisions. Importantly, the PSDF does not create or remove land-use rights but must be taken into account by organs of state when preparing spatial development frameworks, sector plans, and when making decisions that affect land use in the Western Cape. It provides strategic direction and policy guidance rather than site-specific zoning controls, enabling coordinated spatial transformation that balances economic growth, social equity, and environmental sustainability.
Western Cape Noise Control Regulations	Being located within the Western Cape Province, noise from Bantamsklip site is governed under Section 25 of the ECA as “The Western Cape Noise Control Regulations” (PN 200 of 2013). The regulations define the following: ■ Ambient Noise: the all-encompassing sound in a given situation at a given time, measured as the reading on an integrated impulse sound level meter for a total period of at least 10 minutes. ■ Disturbing Noise: a noise, excluding the unamplified human voice, which: (a) exceeds the rating level by 7 dB(A). (b) exceeds the residual noise level where the residual noise level is higher than the rating level. (c) exceeds the residual noise level by 3 dB(A) where the residual noise level is lower than the rating level; or (d) in the case of a low-frequency noise, exceeds the level specified in Annex B of SANS 10103. ■ Noise Sensitive Activity: any activity that could be negatively impacted by noise, including residential, healthcare, educational or religious activities. ■ Rating Level: the applicable outdoor equivalent continuous rating level as indicated in SANS 10103 ■ Residual Noise: the all-encompassing sound in a given situation at a given time, measured as the reading on an integrated impulse sound level meter for a total period of at least 10 minutes, excluding noise alleged to be causing a noise nuisance or disturbing noise. ■ Sound Level: the equivalent continuous rating level as defined in SANS 10103, considering impulse, tone and night-time corrections

Applicable Plan	Description of Plan
	With the above definitions in mind, Section 2 of the regulations prohibits anyone from causing a disturbing noise. While under Section 4(1) the local authority or any other authority responsible for considering an application for a building plan approval, business licence approval, planning approval or environmental authorisation, may instruct the applicant to conduct and submit, as part of the application: (1) a) A noise impact assessment in accordance with SANS 10328 to establish whether the noise impact rating of the proposed land use or activity exceeds the appropriate rating level for a particular district as indicated in SANS 10103; or b) Where the noise level measurements cannot be determined, an assessment, to the satisfaction of the local authority, of the noise level of the proposed land use or activity. (2) a) A person may not construct, erect, upgrade, change the use of or expand any building that will house a noise-sensitive activity in a predominantly commercial or industrial area, unless he or she insulates the building sufficiently against external noise so that the sound levels inside the building will not exceed the appropriate maximum rating levels for indoor ambient noise specified in SANS 10103. b) The owner of a building referred to in paragraph (a) must inform prospective tenants or buyers in writing of the extent to which the insulation measures contemplated in that paragraph will mitigate noise impact during the normal use of the building. c) Paragraph (a) does not apply when the use of the building is not changed. (3) Where the results of an assessment undertaken in terms of sub-regulation (1) indicate that the applicable noise rating levels referred to in that sub-regulation will likely be exceeded, or will not be exceeded but will likely exceed the existing residual noise levels by 5 dB(A) or more: a) The applicant must provide a noise management plan, clearly specifying appropriate mitigation measures to the satisfaction of the local authority, before the application is decided. b) Implementation of those mitigation measures may be imposed as a condition of approval of the application. (4) Where an applicant has not implemented the noise management plan as contemplated in sub-regulation (3), the local authority may instruct the applicant in writing to: a) Cease any activity that does not comply with that plan; or b) Reduce the noise levels to an acceptable level to the satisfaction of the local authority.
Overberg District Municipality 5th Generation Integrated Development Plan (IDP) 2022/23 – 2026/27	The Overberg District Municipality's IDP is a five-year strategic document outlining the municipality's approach to resource allocation, service delivery, and addressing poverty, inequality, and unemployment. The plan focuses on five strategic goals: well-being and infrastructure, regional economic development, institutional development, financial viability, and good governance. Strategic Goal 1 (SG1) aims to ensure the well-being of all in the Overberg through the provision of efficient basic services and infrastructure, including electricity. 93.0% of the municipality uses electricity as primary source of lighting. The IDP identifies load-shedding as a significant strategic risk hindering economic growth and stability. The plan includes an Electricity Blackout Tactical Plan and an Eskom Emergency Strategic Plan. The key primary sectors in the municipality are agriculture, forestry and fishing, and mining and quarrying. The key secondary sectors in the municipality are manufacturing, electricity, gas and water, and construction. In terms of Local Economic Development (LED) in the municipality, the key strategies include the implementing deliverables of RED and Tourism Strategy, job creation initiatives and SCM/LED initiatives.

Applicable Plan	Description of Plan
Overberg District Spatial Development Framework (SDF) 2023	According to the SDF, the electricity network has failed to keep pace with demand. Because of load-shedding, the district experienced reduced revenue through the sale of electricity and increased maintenance and operational costs (especially diesel costs and the rental of generators) over the recent years. This has also resulted in water restrictions due to limiting water abstraction from boreholes and limited transfer of water between reservoirs. The Department of Environmental Affairs (DEA) has committed to contribute to the implementation of the National Development Plan and National Infrastructure Plan by undertaking Strategic Environmental Assessments (SEAs) to identify adaptive processes that integrate the regulatory environmental requirements for Strategic Integrated Projects (SIPs) while safeguarding the environment, including renewable energy and gas. In 2022/23, the allocations for the Electricity functions totals to R104.93 million. The largest allocations are allocated to the Overstrand area, with budgets of R65.4 million for electricity.
Overstrand Integrated Development Plan Review 2025/2026¹⁷²	The Overstrand Municipality IDP sets the five-year strategic trajectory, programmes and service priorities (including bulk services, resilience and disaster management), providing a formal route to integrate enabling bulk infrastructure, off-site upgrades, and mitigation measures associated with large strategic projects. The IDP Review allocates over R60 million for electrical infrastructure, including funding for a new substation in Hermanus and upgrades across several areas. The plan also includes providing indigent support with subsidies and increased free basic electricity. In terms of LED, Overstrand is the second largest contributor in the district with the lowest per capita income in the district. Trade, Manufacturing and Finance are the top performing sectors in the municipality. There is strong indication that the Tourism industry plays a huge role in growth. Overstrand is a popular destination for both local and international visitors with over 900 accommodation establishments and a host of international standards tourism products. Currently, the electricity, gas and water sector accounts for 24.1% of the municipality's low-skilled workforce and 57% semi-skilled. The main challenges faced within the municipality is unemployment, veld fires, load shedding impact on the local economy, floods and inclement weather patterns, and uncontrolled in migration and urbanisation. The shortage of electricity has a negative impact on the local economy in terms of cost of doing business, damage to perishable goods, time on delivery of goods and services, communication breakdown, connectivity losses, cost of fuel for power generation etc. The strain on local business will impact negatively on consumers and unemployment. The electricity crisis will intensify in the foreseeable future, and the implications thereof will have a severe impact on Small Micro Medium Enterprises (SMMEs). Certain areas in the Overstrand Local Municipality have an Electricity Master Plan (EMP), the closest being Gansbaai. Critical issues addressed in EMP are to make provision for future upgrades and improve networks; and to comply with all relevant legislation.

¹⁷² Overstrand Integrated Development Plan (IDP) Review 2025/2026. Final 29 May 2025. 3rd review (2025/26) and amendment of amendment. 5-year IDP in terms of Section 34 of the Municipal Systems Act (MSA), 2000.

Applicable Plan	Description of Plan
Overstrand Municipality Spatial Development Framework (May 2020)	The Overstrand Municipality SDF is the statutory spatial policy guiding land use, settlement form and infrastructure integration in Overstrand, and is to be applied in municipal decision-making. It supports evaluation of strategically located infrastructure led investment provided it is consistent with environmental management and coastal systems policies. Accordingly, the existing available bulk electricity supply in the Bantamsklip area and surrounds is deemed unreliable. In terms of energy management and provision, and in line with the Overstrand Electrical Master Plans and the Overstrand LED Principles and Strategies (2019/23), the municipality aims at continuing with current electricity provision projects, and the maintenance, upgrade and development of the Overstrand's electrical infrastructure networks in conjunction with Eskom. Furthermore, the municipality proposes implementing alternative energy provision projects and demand side management (DSM).

7.7 INTERNATIONAL ENVIRONMENTAL AND SOCIAL STANDARDS

7.7.1 IFC PERFORMANCE STANDARDS

The International Finance Corporation (IFC) is an international financial institution that offers investment, advisory, and asset management services to encourage private sector development in developing countries. The IFC is a member of the World Bank Group (WBG) and is headquartered in Washington, D.C., United States. It was established in 1956 as the private sector arm of the WBG to advance economic development by investing in strictly for-profit and commercial projects that purport to reduce poverty and promote development.

The IFC's stated aim is to create opportunities for people to escape poverty and achieve better living standards by mobilizing financial resources for private enterprise, promoting accessible and competitive markets, supporting businesses and other private sector entities, and creating jobs and delivering necessary services to those who are poverty-stricken or otherwise vulnerable. Since 2009, the IFC has focused on a set of development goals that its projects are expected to target. Its goals are to increase sustainable agriculture opportunities, improve health and education, increase access to financing for microfinance and business clients, advance infrastructure, help small businesses grow revenues, and invest in climate health.

The IFC is owned and governed by its member countries but has its own executive leadership and staff that conduct its normal business operations. It is a corporation whose shareholders are member governments that provide paid-in capital, and which have the right to vote on its matters. Originally more financially integrated with the WBG, the IFC was established separately and eventually became authorized to operate as a financially autonomous entity and make independent investment decisions. It offers an array of debt and equity financing services and helps companies face their risk exposures, while refraining from participating in a management capacity. The corporation also offers advice to companies on making decisions, evaluating their impact on the environment and society, and being responsible. It advises governments on building infrastructure and partnerships to further support private sector development.

The IFC's Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and

Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability. The Access to Information Policy reflects IFC's commitment to transparency and good governance on its operations and outlines the Corporation's institutional disclosure obligations regarding its investment and advisory services. The Performance Standards (PSs) are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the PSs to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives. The PSs may also be applied by other financial institutions (FIs).

The Project is considered a Category A project in terms of the IFC Policy on E&S Sustainability (2012), having the potential to cause limited adverse environmental or social risks and/or impacts that are few, generally site specific, largely reversible, and readily addressed through mitigation measures.

The objectives and applicability of the eight PSs are outlined in Table 7-10.

Table 7-10 – IFC Performance Standards Applicability to the Project

Reference	Requirements	Project Specific Applicability
Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts		
Overview	Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental and Social Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the client, its workers, local communities directly affected by the project (the Affected Communities) and, where appropriate, other stakeholders.	
Objectives	■ To identify and evaluate environmental and social risks and impacts of the project. ■ To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment. ■ To promote improved environmental and social performance of clients through the effective use of management systems. ■ To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately. ■ To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.	
Aspects	1.1	Policy
	1.2	Identification of Risks and Impacts
	1.3	Management Programmes
	1.4	Organisational Capacity and Competency
	1.5	Emergency Preparedness and Response
		The IFC Standards state under PS 1 (Guidance Note 23) that "the breadth, depth and type of analysis included in an ESIA must be proportionate to the nature and scale of the proposed project's potential impacts as identified during the course of the assessment process." This document is the <u>first</u> deliverable from the S&EIR process undertaken for the proposed Project. The impact assessment comprehensively assesses the key environmental and social impacts and complies with the

Reference	Requirements	Project Specific Applicability	
	1.6 Monitoring and Review	requirements of the South African EIA Regulations. In addition, an EMPr will be compiled during the EIA Phase.	
	1.7 Stakeholder Engagement		
	1.8 External Communication and Grievance Mechanism		
	1.9 Ongoing Reporting to Affected Communities		
Performance Standard 2: Labour and Working Conditions;			
Overview	Performance Standard 2 recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.		
Objectives	■ To promote the fair treatment, non-discrimination, and equal opportunity of workers. ■ To establish, maintain, and improve the worker-management relationship. ■ To promote compliance with national employment and labour laws. ■ To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client’s supply chain. ■ To promote safe and healthy working conditions, and the health of workers. ■ To avoid the use of forced labour.		
Aspects	2.1	Working Conditions and Management of Worker Relationship Human Resources Policy and Management Working Conditions and terms of Engagement Workers organisation Non- Discrimination and Equal Opportunity Retrenchment Grievance Mechanism	The construction activities will require contractors for completion. A safe working environment and fair contractual agreements must be in place. The operational phase will have permanent employees for day-to-day activities as well as contractors who will all need a safe working environment and fair contractual agreements. Whilst PS2 will be applicable to the Project, it is not intended to be addressed in detail during the Scoping Phase. Recommendations are provided concerning development of a detailed Human Resources (HR) and Occupational Health and Safety (OHS) system by the developer and its partners as the Project moves towards implementation. In addition, measures to address the Interim Advice for IFC Clients on Supporting Workers in the Context of COVID-19 are referenced. An EMPr will be compiled during the EIA phase that will incorporate the requirements for compliance with local and international Labour and Working legislation and good practice on the part of the contractors.
	2.2	Protecting the Workforce Child Labour Forced Labour	
	2.3	Occupational health and Safety	
	2.4	Workers Engaged by Third Parties	
	2.5	Supply Chain	
Performance Standard 3: Resource Efficiency and Pollution Prevention			
Overview	Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. There is also a growing global consensus that the current and projected atmospheric concentration of GHGs threatens the public health and welfare of current and future generations. At the same time, more efficient and effective resource use and pollution prevention and GHG emission avoidance and mitigation technologies and practices have become more accessible and achievable in virtually all parts of the world.		
Objectives	■ To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities. ■ To promote more sustainable use of resources, including energy and water. ■ To reduce project related GHG emissions.		
Aspects	3.1	Policy Resource Efficiency GHGs	

Reference	Requirements	Project Specific Applicability
	Water Consumption	
3.2	Pollution Prevention Air Emissions Stormwater Waste Management Hazardous Materials Management Pesticide use and Management	PS 3 applies to the NPP as a result of material resource use and pollution risks. The NPP clearly falls within PS3's scope because it is a large, resource-intensive, industrial facility with potential emissions, effluents, wastes, and hazardous materials that must be actively managed throughout construction, operation, and decommissioning. Resource efficiency obligations (energy, water, materials) PS3 requires clients to implement technically and financially feasible measures to improve efficiency in the use of energy, water, and raw materials. A nuclear power plant triggers this requirement because: ■ Water use • Nuclear plants typically rely on large volumes of cooling water (once-through or closed-loop systems). • PS3 is triggered by: – Abstraction of surface or groundwater – Consumptive losses through evaporation – Thermal discharges that may affect downstream users or ecosystems • Eskom must demonstrate efficient cooling system selection, water balance optimisation, and minimisation of freshwater demand. ■ Energy efficiency • Although nuclear power produces low-carbon electricity, PS3 still applies to: – Auxiliary power consumption – Cooling systems, pumps, fuel handling, and waste management systems • The standard requires assessment of energy efficiency measures and benchmarking against good international industry practice (GIIP). ■ Material efficiency • Large quantities of concrete, steel, chemicals, and process materials are used during construction and operation. • PS3 applies through requirements to: – Minimise material use – Reduce waste generation at source – Promote reuse and recycling where feasible Pollution prevention and control PS3 is explicitly triggered where a project may generate emissions to air, discharges to water, waste, noise, or other pollutants that could affect human health or the environment. [ifc.org] A nuclear power plant triggers this element through: ■ Emissions to air (non-radiological) • While nuclear plants have minimal combustion emissions during operation, • PS3 still applies to: – Backup diesel generators – Construction equipment – Emergency systems testing • These emissions must comply with GIIP and applicable standards. ■ Thermal pollution • Discharge of heated cooling water can alter aquatic ecosystems.

Reference	Requirements	Project Specific Applicability
		- PS3 requires: - Assessment of thermal plume impacts - Design and operational controls to avoid or minimise ecological harm - Liquid effluents - Controlled releases of treated process water (including non-radioactive effluents) trigger PS3 obligations to: - Prevent pollution - Meet regulatory and GIIP discharge criteria - Monitor and report effluent quality Waste management, including hazardous waste PS3 applies strongly because nuclear projects generate multiple waste streams, including hazardous materials. - Non-radioactive waste - Construction debris, chemicals, oils, and operational wastes must be managed according to the waste hierarchy (avoid, reduce, reuse, recycle, dispose). - Radioactive waste (interface with PS3) - While radiological safety is primarily regulated under nuclear-specific frameworks, PS3 is triggered insofar as it addresses: - Safe handling, storage, and minimisation of hazardous materials - Prevention of accidental releases affecting workers, communities, or the environment - PS3 requires alignment with international good practice, even where national regulations are robust. GHG emissions PS3 requires projects to quantify and report direct and indirect GHG emissions where emissions are expected to exceed defined thresholds or where material reductions are feasible. A nuclear power plant triggers this requirement because: - Lifecycle emissions (construction, fuel cycle, auxiliary systems) must be assessed. PS3 expects: - GHG inventory preparation - Identification of feasible emission-reduction measures, even for low-carbon technologies Hazardous materials management PS3 applies wherever hazardous substances are used, stored, or transported. For nuclear plants, this includes: - Fuels and lubricants - Water treatment chemicals - Resins, solvents, and decontamination agents - PS3 requires systems to: - Prevent spills and leaks - Ensure secondary containment - Train personnel and maintain emergency response readiness Life-cycle perspective (construction → operation → decommissioning) PS3 applies across the full project life cycle, which is particularly important for nuclear facilities. This includes: - Construction-phase pollution and resource use - Long-term operational efficiency and emissions control - Decommissioning waste volumes, hazardous materials, and contaminated land management

Reference	Requirements	Project Specific Applicability
Performance Standard 4: Community Health, Safety, and Security		
Overview	Performance Standard 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts.	
Objectives	- To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. - To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.	
Aspects	4.1	Community Health and Safety Infrastructure and Equipment Design and Safety Hazardous Materials Management and Safety Ecosystem Services Community Exposure to Disease Emergency Preparedness and Response Performance Standard 4: Community Health, Safety, and Security applies where project activities may increase risks to the health and safety of surrounding communities or involve security arrangements. The IFC explicitly recognises that large infrastructure and energy projects can expose communities to risks from hazardous materials, accidents, emergency events, and security forces. A nuclear power plant clearly triggers PS4 because of the severity, scale, and potential consequences of credible accident scenarios, as well as routine operational interfaces with nearby communities. Exposure of communities to hazardous materials and technologies PS4 is triggered when communities may be exposed to hazardous materials, infrastructure failures, or industrial accidents. A nuclear power plant triggers this requirement because: - It involves radioactive materials, nuclear fuel, and radioactive waste - Although the probability of major accidents is low, the potential consequences for surrounding populations are high - PS4 focuses on risk exposure, not only likelihood This obliges the applicant to: - Identify credible accident scenarios affecting communities - Demonstrate that plant design, siting, and operation reduce risks to as low as reasonably practicable, consistent with GIIP and international nuclear safety frameworks Emergency preparedness and response for community protection PS4 explicitly requires projects to assist and collaborate with communities and public authorities in emergency preparedness and response where project-related risks could affect them. A nuclear power plant triggers this requirement because: - Potential emergency scenarios (radiological release, loss of cooling, external hazards) could require off-site protective actions Communities may need: - Early warning systems - Evacuation or shelter-in-place planning - Clear communication protocols Under PS4, the applicant must: - Prepare emergency response plans that extend beyond the site boundary - Coordinate with local and national authorities - Ensure communities are informed about emergency procedures in a culturally appropriate manner
	4.2	Security Personnel

Reference	Requirements	Project Specific Applicability
		Infrastructure and traffic-related community safety risks PS4 applies where project infrastructure and activities create accidental risks to the public, including transport and construction hazards. A nuclear power plant triggers this through: - Transport of construction materials, large components, and hazardous substances - Movement of nuclear fuel and radioactive waste (even if infrequent) - Increased traffic volumes during construction and outages PS4 requires: - Assessment of traffic and transport risks to nearby communities - Design and operational measures to prevent accidents involving the public - Community-level safety awareness where risks cannot be fully eliminated Operational health impacts on surrounding communities PS4 covers non-occupational health impacts, including those arising from routine project operations. For nuclear power plants, this includes: - Potential community exposure to: - Non-radiological emissions (e.g. from backup generators) - Noise during construction and operation - Thermal discharges affecting fisheries and livelihoods (linked to community health and food security) PS4 requires: - Identification of community health pathways - Mitigation measures where project activities could adversely affect health, even where impacts are indirect or cumulative Security arrangements and use of security forces PS4 is explicitly triggered when projects use private or public security personnel to protect facilities and assets. A nuclear power plant triggers this requirement because: - Nuclear facilities are high-security installations - Armed security forces are typically required to prevent sabotage, theft, or terrorism PS4 obliges the applicant to: - Ensure security arrangements are proportionate and risk-based - Prevent excessive use of force - Respect human rights in interactions with local communities - Establish grievance mechanisms for security-related incidents Risk perception and community trust While PS4 is risk-based rather than perception-based, the IFC recognises that fear, uncertainty, and stress related to high-hazard facilities can affect community wellbeing. For nuclear projects, PS4 is triggered because: - Community concerns about radiation, accidents, or emergency response can themselves become health and safety issues - Transparent communication and preparedness are essential components of risk management

Reference	Requirements		Project Specific Applicability
			Life-cycle applicability PS4 applies throughout the project life cycle, which is particularly relevant for nuclear power plants. This includes: - Construction-phase community safety risks - Long-term operational emergency preparedness - Decommissioning activities that may re-introduce transport, waste, and security risks
Performance Standard 5: Land Acquisition and Involuntary Resettlement			
Overview	Performance Standard 5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use.		
Objectives	- To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs. - To avoid forced eviction. - To anticipate and avoid, or where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. - To improve, or restore, the livelihoods and standards of living of displaced persons. - To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.		
Aspects	5.1	Displacement Physical Displacement Economic Displacement Private Sector Responsibilities under Government Managed Resettlement	PS5 is not applicable to the proposed NPP as no physical or economic displacement or livelihood restoration will be required. The proposed NPP is located on Eskom owned land.
Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources			
Overview	Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development.		
Objectives	- To protect and conserve biodiversity. - To maintain the benefits from ecosystem services. - To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.		
Aspects	6.1	Protection and Conservation of Biodiversity	Both the Thyspunt and Bantamsklip sites fall within areas that are considered ecologically sensitive with the presence of CBAs and ESAs. A Terrestrial Biodiversity Impact Assessment (including fauna, flora and invertebrates), an Avifaunal Impact Assessment, a Marine Ecology Impact Assessment and a Wetland Impact Assessment have been included in the proposed scope for the EIA phase. Furthermore, the requirement for a biodiversity offset plan has been confirmed and the Biodiversity offset strategy will be included in the EIA report.

Reference	Requirements		Project Specific Applicability
			The methodologies for the specialist assessments include a combination of literature review, in-field surveys and sensitivity mapping. This substantively complies with the PS 6 general requirements for scoping and baseline assessment for determination of biodiversity and ecosystem services issues. The determination of habitat sensitivity was undertaken within the legal and best practice reference framework for South Africa. The prevalence of invasive alien species will be determined, and mitigation and management measures will be included in the EMPr during the EIA Phase.
Performance Standard 7: Indigenous People			
Overview	Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded.		
Objectives	■ To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. ■ To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts. ■ To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. ■ To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. ■ To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present. ■ To respect and preserve the culture, knowledge, and practices of Indigenous Peoples.		
Aspects	7.1	General Avoidance of Adverse Impacts Participation and Consent	Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalised and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded. The term "Indigenous Peoples" is used in a generic sense to refer to a distinct social and cultural group possessing the following characteristics in varying degrees: ■ Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; ■ Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories; ■ Customary cultural, economic, social, or political institutions that are separate from those of the mainstream society or culture; or ■ A distinct language or dialect, often different from the official language or languages of the country or region in which they reside.
	7.2	Circumstances Requiring Free, Prior, and Informed Consent Impacts on Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use Critical Cultural Heritage Relocation of Indigenous Peoples from Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use	
	7.3	Mitigation and Development Benefits	
	7.4	Private Sector Responsibilities Where Government is Responsible for Managing Indigenous Peoples Issues	

Reference	Requirements		Project Specific Applicability
			IA preliminary screening aligned with IFC PS7 indicates that although the project area may not meet the strict lender classification of Indigenous Peoples, there are recognised First Nations, Khoisan and culturally affiliated heritage communities with longstanding ancestral, spiritual and symbolic connections to the coastlines. Therefore, direct engagement with affected stakeholders and first nations groups registered as I&APs with an interest in the proposed development will take place with specific consideration of the anticipated heritage impacts.
Performance Standard 8: Cultural Heritage			
Overview	Performance Standard 8 recognizes the importance of cultural heritage for current and future generations.		
Objectives	- To protect cultural heritage from the adverse impacts of project activities and support its preservation. - To promote the equitable sharing of benefits from the use of cultural heritage.		
Aspects	8.1	Protection of Cultural Heritage in Project Design and Execution	A Cultural Heritage Impact Assessment Report will be carried out by a suitably qualified specialist, to investigate archaeological sites (Stone Age and Historic Archaeological), cultural heritage sites, burial grounds or isolated artifacts that may be present within the affected landscapes. A Chance Find Procedure will be included in the EMPr during the EIA Phase

7.7.2 WORLD BANK GROUP ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

In support of the Performance Standards, the World Bank Group (WBG) has published several Environmental Health and Safety (EHS) Guidelines. The EHS Guidelines are technical reference documents that address IFC's expectations regarding the industrial pollution management performance of its projects. They are designed to assist managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, minimising, and controlling EHS impacts during the construction, operation, and decommissioning phase of a project or facility. The EHS Guidelines serve as a technical reference source to support the implementation of the IFC Performance Standards, particularly in those aspects related to PS3: Pollution Prevention and Abatement, as well as certain aspects of occupational and community health and safety.

Where host country regulations differ from the levels and measures presented in the EHS Guidelines, projects seeking international funding may be expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is required.

There are no World Bank Group Industry Sector EHS Guidelines specifically for nuclear power plants. As a result, nuclear power projects rely on a combination of the General EHS Guidelines plus selected sectoral guidelines, supplemented by international nuclear safety standards (e.g. IAEA), as Good International Industry Practice (GIIP).

The following IFC / WBG EHS Guidelines have been generally consulted during the S&EIR process in order to aid the identification of EHS aspects applicable to the project:

- Electric Power Transmission and Distribution (2007) – information relevant to power transmission between a generation facility and a substation located within an electricity grid, in addition to power distribution from a substation to consumers located in residential, commercial, and industrial areas.
- General EHS Guidelines – this includes a section on a range of environmental, occupational health and safety, community health and safety, and construction activities that would apply to the project. The guideline also contains recommended guidelines adopted from the World Health Organisation (WHO) for ambient air and water quality, which are referred to in the relevant impact assessment sections in the ESIA report.

7.7.3 EQUATOR PRINCIPLES

The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing, and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making.

The EPs apply globally to all industry sectors and to five financial products 1) Project Finance Advisory Services, 2) Project Finance, 3) Project-Related Corporate Loans, 4) Bridge Loans and 5) Project-Related Refinance and Project-Related Acquisition Finance. The relevant thresholds and criteria for application is described in detail in the Scope section of the EP. Currently 125 Equator Principles Financial Institutions (EPFIs) in 37 countries have officially adopted the EPs, covering the majority of international project finance debt within developed and emerging markets. EPFIs commit to implementing the EPs in their internal environmental and social policies, procedures and standards for financing projects and will not provide Project Finance or Project-Related Corporate Loans to projects where the client will not, or is unable to, comply with the EPs.

While the EPs are not intended to be applied retroactively, EPFIs apply them to the expansion or upgrade of an existing project where changes in scale or scope may create significant environmental and social risks and impacts or significantly change the nature or degree of an existing impact. The EPs have greatly increased the attention and focus on social/community standards and responsibility, including robust standards for indigenous peoples, labour standards, and consultation with locally affected communities within the Project Finance market.

The EPs have also helped spur the development of other responsible environmental and social management practices in the financial sector and banking industry and have supported member banks in developing their own Environmental and Social Risk Management Systems.

The requirements and applicability of the EPs are outlined in Table 7-11.

It should be noted that Principles 8 and 10 relate to a borrower's code of conduct and are therefore not considered relevant to the S&EIA process and have not been included in this discussion.

Table 7-11 – Requirements and Applicability of the Equator Principles

Requirement		Project Specific Applicability
Principle 1: Review and Categorisation		
Overview	When a project is proposed for financing, the EPFI will, as part of its internal social and environmental review and due diligence, categorise such project	Based upon the significance and scale of the Project's environmental and social impacts, the proposed project is regarded as a Category A

Requirement		Project Specific Applicability
	based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC. Using categorisation, the EPFI's environmental and social due diligence is commensurate with the nature, scale, and stage of the Project, and with the level of environmental and social risks and impacts. The categories are: ■ Category A: Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented; ■ Category B: Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and ■ Category C: Projects with minimal or no adverse environmental and social risks and/or impacts.	project i.e., a project with by significant potential adverse environmental and social impacts. These may include large-scale infrastructure projects, projects in sensitive ecological areas, or those affecting vulnerable communities.
Principle 2: Environmental and Social Assessment		
Overview	For all Category A and Category B Projects, the EPFI will require the client to conduct an appropriate Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and scale of impacts of the proposed Project (which may include the illustrative list of issues found in Exhibit II). The Assessment Documentation should propose measures to minimise, mitigate, and where residual impacts remain, to compensate/ offset/ remedy for risks and impacts to Workers, Affected Communities, and the environment, in a manner relevant and appropriate to the nature and scale of the proposed Project The Assessment Documentation will be an adequate, accurate and objective evaluation and presentation of the environmental and social risks and impacts, whether prepared by the client, consultants or external experts. For Category A, and as appropriate, Category B Projects, the Assessment Documentation includes an Environmental and Social Impact Assessment (ESIA). One or more specialised studies may also need to be undertaken. For other Category B and potentially C Projects, a limited or focused environmental or social assessment may be appropriate, applying applicable risk management standards relevant to the risks or impacts identified during the categorisation process. The client is expected to include assessments of potential adverse Human Rights impacts and climate change risks as part of the ESIA or other Assessment, with these included in the Assessment Documentation.	This document is the first deliverable (i.e., <u>Draft Scoping Report</u>) from the S&EIR process undertaken for the proposed Project. The impact assessment will be undertaken during the next phase of the S&EIR process. The assessment will comprehensively assess the key environmental and social impacts and complies with the requirements of the South African EIA Regulations. In addition, an EMPr will also be compiled during the EIA Phase.
Principle 3: Applicable Environmental and Social Standards		

Requirement		Project Specific Applicability
Overview	The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues. The EPFI's due diligence will include, for all Category A and Category B Projects globally, review and confirmation by the EPFI of how the Project and transaction meet each of the Principles. For Projects located in Non-Designated Countries, the Assessment process evaluates compliance with the then applicable IFC PS and WBG EHS Guidelines. For Projects located in Designated Countries, compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.	As South Africa has been identified as a non-designated country, the reference framework for environmental and social assessment is based on the IFC PS. In addition, this S&EIR process has been undertaken in accordance with NEMA (the host country's relevant legislation).
Principle 4: Environmental and Social Management System and Equator Principles Action Plan		
Overview	For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards. Where the applicable standards are not met to the EPFI's satisfaction, the client and the EPFI will agree on an Equator Principles Action Plan (EPAP). The EPAP is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards.	A formal project specific ESMS will be compiled in the event that the project is developed in the future. Management and monitoring plans outlined in the EMPr will serve as the basis for an ESMS for the proposed Project.
Principle 5: Stakeholder Engagement		
Overview	EPFI will require the client to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with Affected Communities Workers and, where relevant, Other Stakeholders. For Projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation process. To accomplish this, the appropriate assessment documentation, or non-technical summaries thereof, will be made available to the public by the borrower for a reasonable minimum period in the relevant local language and in a culturally appropriate manner. The borrower will take account of and document the process and results of the consultation, including any actions agreed resulting from the consultation. Disclosure of environmental or social risks and adverse impacts should occur early in the Assessment process, in any event before the	The S&EIR process includes an extensive stakeholder engagement process which complies with the South African EIA Regulations. The process includes consultations with local communities, nearby businesses, and a range of government sector stakeholders (state owned enterprises, national, provincial and local departments). The stakeholder engagement process solicits interest from potentially interested parties through the placement of site notices and newspaper advertisements as well as written and telephonic communication. Furthermore, the stakeholder engagement process will include both online and in-person meetings. The stakeholder engagement process is detailed in Section 2 and in the PPR included in Appendix B. A Stakeholder Engagement Plan (SEP) and a Grievance Mechanism has been developed for the S&EIR process. These documents are "living documents" that will continue to be updated as the

Requirement		Project Specific Applicability
	Project construction commences, and on an ongoing basis. All Projects affecting Indigenous Peoples will be subject to a process of Informed Consultation and Participation and will need to comply with the rights and protections for Indigenous Peoples contained in relevant national law, including those laws implementing host country obligations under international law.	project progresses through the construction and operational phases.
Principle 6: Grievance Mechanism		
Overview	For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the ESMS, to establish effective grievance mechanisms which are designed for use by Affected Communities and Workers, as appropriate, to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance. The borrower will inform the Affected Communities and Workers about the grievance mechanism in the course of the stakeholder engagement process and ensure that the mechanism addresses concerns promptly and transparently, in a culturally appropriate manner, and is readily accessible, at no cost, and without retribution to the party that originates the issue or concern.	The EMPr will include a Grievance Mechanism Process for Public Complaints and Issues. This procedure effectively allows for external communications with members of the public to be undertaken in a transparent and structured manner. A Grievance Mechanism has been developed for the S&EIR process and is attached as an appendix to the PPR included in Appendix B. The documents are "living documents" that will continue to be updated as the project progresses through the construction and operational phases.
Principle 7: Independent Review		
Overview	For all Category A and, as appropriate, Category B Projects, an Independent Environmental and Social Consultant, not directly associated with the client, will carry out an Independent Review of the Assessment Documentation including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence, and assess Equator Principles compliance.	This principle will only become applicable in the event that the project is developed in the future.
Principle 9: Independent Monitoring and Reporting		
Overview	To assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting for all Category A, and as appropriate, Category B projects. Monitoring and reporting should be provided by an Independent Environmental and Social Consultant; alternatively, the EPFI will require that the client retain qualified and experienced external experts to verify its monitoring information, which will be shared with the EPFI in accordance with the frequency required.	This principle will only become applicable in the event that the project is developed in the future.

7.8 OTHER GUIDELINES AND BEST PRACTICE RECOMMENDATIONS

7.8.1 GENERIC EMPR RELEVANT TO AN APPLICATION FOR SUBSTATION AND OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

NEMA requires that an EMPr be submitted where an EIA has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation. The content of an EMPr must either contain the information set out in Appendix 4 of the EIA Regulations, 2014, as amended, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the CA.

GN 435 of 22 March 2019 identified a generic EMPr relevant to applications for substations and overhead electricity transmission and distribution infrastructure which require authorisation in terms of Section 42(2) of NEMA. Applications for overhead electricity transmission and distribution infrastructure that trigger Activity 11 of Listing Notice 1 or Activity 9 of Listing Notice 2 and any other listed or specified activities must use the generic EMPr.

The objective of the generic EMPr is “to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.”

The generic EMPr for the HV Yard will be included in the Site-Specific EMPr during the EIA phase.

7.8.2 ADDITIONAL PERMITS AND AUTHORISATIONS

Table 7-12 outlines the key additional permits and authorisations required for the proposed development, as well as the relevant Competent Authorities responsible.

Table 7-12 – Additional Permits and Authorisations required for the proposed development

Permits/Authorisation	Legislation	Relevant Authority	Status
Strategic Infrastructure Project (SIP) Status	Planning and Development (Strategic Infrastructure) Act 2006	Infrastructure South Africa	In Progress Application submitted on 20 November 2025
Nuclear Installation Licence (NIL)	National Nuclear Regulator Act (Act 47 of 1999)	National Nuclear Regulator	In progress
Water Use Licence / General Authorisation	National Water Act (Act No. 36 of 1998)	Department of Water and Sanitation	To be undertaken post receipt of the EA
Atmospheric Emissions Licence	National Environmental Management: Air Quality Act (Act No. 39 of 2004)	Levant district municipality	To be undertaken post receipt of the EA

Permits/Authorisation	Legislation	Relevant Authority	Status
Waste Management License	National Environmental Management: Waste Act (Act No. 59 of 2008)	DFFE	To be confirmed once associated infrastructure is finalised
Coastal waters discharge permit	National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008)	DFFE	To be undertaken post receipt of the EA
Notification of Intent to Develop (NID) Section 38 (1) and Section 38 (8)	National Heritage Resource Act (Act No. 25 of 1999)	South African Heritage Resources Authority (SAHRA)	In Progress
Permits for destruction or excavation of archaeological sites	National Heritage Resource Act (Act No. 25 of 1999), Section 35	South African Heritage Resources Authority (SAHRA)	To be confirmed prior to construction
Protect Plant Permits	National Forest Act (Act No. 84 of 1998)	DFFE	To be confirmed prior to construction
Obstacle Permit	Civil Aviation Act (Act- 13 of 2009)	Air Traffic and Navigation Services / Civil Aviation Authority	Conditional Approval will be required for the facility prior to construction.
No fly zone declared	Civil Aviation Act (Act- 13 of 2009)	Air Traffic and Navigation Services / Civil Aviation Authority	To be undertaken before operations
Marine Exclusion zone and sea-shore lease	Sea Shore Act (Act 21 of 1935)	Provincial Environmental Authorities	To be undertaken before construction

7.9 CONSISTENCY WITH NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA) PRINCIPLES

Table 7-13 outlines the NPP's consistency with the NEMA Principles.

Table 7-13 – Consistency of the NPP and the EIA Process with the NEMA principles

NEMA Principles	Discussion
(2) Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.	The project is designed to serve the needs for electricity of South Africa's citizens. The proposal for a nuclear power station is part of Eskom's long-term planning for meeting energy needs for the next few decades. Although all the specialists undertake their studies from a sustainability point of view, this principle was specifically upheld by all specialists undertaking the studies within the social environment. All studies included the assessment of impacts that either directly or indirectly affect people and their living environment. The NPP project aims to demonstrate a technology that could improve access to electricity that has a lower climate change impact than conventional power generation technologies such as coal-fired power.

NEMA Principles	Discussion
(3) Development must be socially, environmentally and economically sustainable.	In spite of the high cost of a nuclear power station relative to coal-fired power stations, South Africa must start to reduce its reliance on coal-based electricity. Furthermore, when the life-cycle impacts of coal-based power generation are considered in relation to those of nuclear generated power, nuclear power has by far the lowest impacts. All studies were required to uphold the principle of sustainable development. The NPP will be constructed, operated and decommissioned according to the Environmental Management Policies and Systems that apply to it.
(4) (a) Sustainable development requires the consideration of all relevant factors including the following:	
(i) That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;	All specialist studies have included preliminary recommendations and mitigation measures that encourage the minimisation or avoidance of the disturbance of ecosystems, in particular a number of buffer zones surrounding sensitive ecosystems have been imposed. These mitigation measures will be further enhanced during the EIA phase and will be included in the EMPr. The NPP will be required to adhere to the EMPr developed for its construction and operation.
(ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;	The major pollution generated by the project will be nuclear waste. Low level and intermediate level nuclear waste will be managed by disposal at the purpose-designed Vaalputs waste disposal site. High level waste will be stored safely on site. The footprint of the nuclear power station will be minimised, and the remainder of the site is proposed to be managed as a private nature reserve. All specialist studies are required to identify recommendations and mitigation measures that encourage the minimisation or avoidance of pollution and degradation of the study area due to construction and operational activities. These mitigation measures will be included in the EMPr in the EIA phase. The NPP will be required to adhere to the EMPr developed for its construction and operation.
(iii) that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;	The Heritage Impact Assessment and Palaeontology Impact Assessment will investigate this principle. Heritage features were identified to be affected by the facility and preliminary mitigation and management measures have been recommended for use in the event that heritage sites or artefacts are discovered during the construction period. These mitigation measures will be included along with other more generic specifications in the EMPr. The NPP will be required to adhere to the EMPr developed for its construction and operation.
(iv) that waste is avoided or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;	Waste soil from the excavations s proposed be pumped to sea, where it will disperse through water movement and cause minimum impact. Low level, intermediate level and high level radioactive waste will be managed and disposed responsibly through disposal at a radioactive waste disposal site and through on-site containment, respectively.

NEMA Principles	Discussion
	Impacts in this regard will be investigated in greater detail during the EIA Phase of the project. The NPP will be required to adhere to the EMPr developed for its construction and operation.
(v) that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;	The construction of a nuclear power station places less reliance on the use of coal as a non-renewable resource for energy generation and therefore offsets the wide-scale direct and indirect impacts (e.g. acidification and pollution of soil, groundwater and surface water resources) and that would be caused by the construction of a coal-fired power station. The project is one of a range of projects for the next two decades, including the use of renewable technologies and demand management that Eskom is planning to implement to meet South Africa's energy demands.
(vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;	The project will not cause the significant destruction of rare or endangered ecosystems. Both Bantamsklip and Thyspunt support ecologically important habitat within largely natural coastal landscapes, and both Project Areas of Influence (PAOIs) contain receptors that are sensitive to large-footprint, long-duration infrastructure such as a NPP and its associated roads, servitudes, yard infrastructure and security footprint. Across both sites, the receiving environment includes threatened/under-protected ecosystem types, CBA features, KBA context and/or proximity to conservation areas, meaning that the project will need to be taken forward on the basis of a strict mitigation hierarchy with strong emphasis on avoidance and footprint discipline, followed by minimisation, rehabilitation/restoration, and offsets where residual impacts remain.
(vii) that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and	Undertaking any project based on new technology could be considered risky. It can be said that a "Cautious approach" is being followed. The NPP project is characterised by extended planning horizons and evolving policy and technology contexts. At the time of this S&EIR process a decision on the specific design of the plant had not been made yet. Therefore, a PPE approach will be employed in order to assess the potential environmental impacts of the proposed activity. The ESIA will be technology neutral, meaning it will use parameters from multiple plant technologies as well as auxiliary infrastructure that are most likely to be deployed on the proposed sites and provide an assessment of the likely effects of the new NPP by using bounding case. This means that none of the individual technology designs and auxiliary infrastructure would have a greater impact on the environment, socio-economic conditions or human health than what is included in the PPE and assessed in the ESIA. This approach provides flexibility for the proposed NPP and future new nuclear deployments.
(viii) that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.	The purpose of this S&EIR process is to ensure that sufficient intelligible information on the possible future outcomes of this proposed project are available to the public and to authorities before embarking on this course of action. All identified potential impacts have been investigated in detail to enable informed decision-making.

NEMA Principles	Discussion
	The S&EIR process in itself is a tool that is utilised to ensure that impacts on the environment and on people's rights are anticipated. Where a specialist study identifies a negative impact, mitigation measures will be proposed in order to either prevent or minimise the impact. These mitigation measures will be included in the EMPr during the EIA Phase.
(4) (b) Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.	This S&EIR process recognises the linkage between various elements of the environment. It is recognised that no course of action, for whatever project, is ever entirely without costs to some sectors of society, and that the goal of responsible environmental management must be to choose the option with the least cost of the best balance of costs and benefits. The S&EIR process and all specialist studies will be undertaken taking best practise principles into consideration. The integration of the studies will be ensured by specialist interaction during the study period and the integration of their findings. The construction, operation and decommissioning of the NPP project will be undertaken in recognition of the need for a holistic approach to environmental management.
(4) (c) Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.	All studies are required to uphold the principle of sustainable development. The S&EIR and public participation processes will be comprehensive and will ensure that all affected persons have the opportunity to raise their concerns about the impacts of the project. Interactions with the affected public will include not only public forums, but also individual interactions with members of the social impact assessment team, to ensure that all possible opinions about the project (including those from vulnerable persons) are heard. The land for both alternative sites is already owned by Eskom, thus the acquisition of the land does not negatively affect any person or group.
(4) (d) Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.	The project is designed to meet the need for electricity of present and future generations of South Africans. Access to electricity is recognised as a basic human need and is vital for the sustenance and growth of the economy. The impacts on the economy of load serves as an illustration of this. Relatively insignificant impacts in terms of restrictions to access to resources are anticipated to be caused by the security zones around the NPP, especially the seaward restriction on access. Access could, however, still be granted through a permit application to Eskom. Given the strategically important nature of the power station to South Africa's national security, the access restrictions are regarded as an acceptable impact. All studies were required to uphold the principle of sustainable development. The project in totality will benefit the community both regionally and locally. The project will give greater certainty in terms of the ability to provide present and future needs for electricity to all sectors of the populations including those that may have been disadvantaged by unfair discrimination. Locally communities may benefit from aspects such as job creation particularly within the construction phase.
(4) (e) Responsibility for the environmental health and safety consequences of a policy,	The possible radiological and other health impacts of a Nuclear Power Station are considered in detail in the licensing process for

NEMA Principles	Discussion
programme, project, product, process, service or activity exists throughout its life cycle.	the National Nuclear Regulator (NNR). Limits of acceptable radiological emissions are set by the NNR and no nuclear power station will be allowed by the NNR unless it can be proven that the design of the proposed nuclear power station is capable of complying to these limits. The S&ER process will assess impacts throughout the life cycle of the development from construction to decommissioning. All specialist studies are also required to uphold the principle of sustainable development. The EMPr and the auditing processes as required by Eskom's EMS will ensure that these responsibilities are up held throughout the projects' life cycle.
(4) (f) The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.	A comprehensive Public Participation Process is being undertaken. I&APs will be given the opportunity to comment on all S&EIR process documentation (i.e. Scoping and EIA Reports). All comments received from interested and affected parties will be addressed comprehensively in a comments and response report. The public participation process includes meetings in all directly and indirectly affected settlements close to the alternative sites of the proposed NPP. Public input will continue through to the construction, operational and decommissioning stages of the project through the provisions that will be made in the EMPr to appoint a community liaison officer, whose duties must include communication regarding environmental issues.
(4) (g) Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge. Including traditional and ordinary knowledge.	The comments and queries from I&APs will be either taken into account or responded to within the studies being undertaken. The S&EIR process will take into the account the interests, needs and values of all interested and affected parties who submit comments during the Scoping and EIA phases of the project. Communication will continue through to the construction, operational and decommissioning stages of the project through the provisions that will be made in the EMPr to appoint a community liaison officer.
(4) (h) Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	To the extent possible within a S&EIR process, communities will be empowered by providing them with knowledge about nuclear power generation, to enable them to make an informed decision about the costs and benefits of this form of electricity generation technology.
(4) (i) The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.	The S&EIR process considered impacts in an integrated manner. Social, economic, biophysical impacts will be assessed and considered.
(4) (j) The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.	This will be up held in the EMPr where the required Occupational Health and Safety specifications will be dealt with during the EIA Phase Workers on the proposed NPP during the operational phase must be fully informed of the risks associated with radioactive fuel and electricity generation and must be fully protected with the appropriate personal protective equipment. Their rights to refuse certain work, if appropriate precautions against health impacts are not taken, must be respected.

NEMA Principles	Discussion
(4) (k) Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.	All documentation compiled as a result of the S&EIR process will be made available for public comment and scrutiny, as per legal requirements, prior to the finalisation and submission of these reports to the DFFE . Communication will continue through to the construction and operational stages of the project through the provisions that will be made in the EMPr to appoint a community liaison officer.
(4) (l) There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.	The co-operative agreement between the DFFE and the NNR, as discussed earlier in this Chapter, provides a framework for co-operation between these organs of state, as far as decision-making for this project is concerned. The agreement recognises the distinct yet overlapping roles of the authorities and is designed to ensure that duplication and inefficiency are avoided. Furthermore, the EIA process makes allowance for discussion between different authorities at local, provincial and national levels.
(4) (m) Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.	The Public Participation Process endeavoured to ensure that conflict between organs of state was minimised throughout the project duration. The national DFFE is the decision-making authority in this instance, in terms of the environmental impacts of the project. The S&EIR process provides ample opportunity for the other spheres of government, namely provincial and local government, to have an input into the process. The process also provides for all other organs of state to be informed as interested and affected parties. The DFFE is obliged to consult the relevant provincial authority prior to making a decision about authorisation of the project. Should disputes arise between any organs of state during the decision-making process, the necessary dispute resolution procedures will be followed.
(4) (n) Global and international responsibilities relating to the environment must be discharged in the national interest.	All specialist studies will endeavour to up hold this principle. The S&EIR process will take cognisance of international obligations in the form of treaties and similar agreements that could have an influence on the project. The integration of new nuclear power stations into South Africa's energy generation mixture is part of South Africa and Eskom's response to the threat of global warming. This response is in the interest of the national and international interest.
(4) (o) The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.	The NPP will connect to the national grid. The provision of electricity is seen to be in the public interest. All specialist studies will endeavour to uphold this principle. Eskom, as a public entity, is obliged to manage the site for a nuclear power station responsibly and in interests of the affected communities. It is proposed that the property on which the NPP will be constructed is managed as a private nature reserve.
(4) (p) The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects	Prevention and mitigation of environmental impacts will be the responsibility of Eskom as applicant for the NPP. Eskom will be held responsible for the implementation of the measures specified in the EIA report through a legally enforceable EMPr, which will be independently monitored by an Environmental Control Officer.

NEMA Principles	Discussion
must be paid for by those responsible for harming the environment.	
(4) (q) The vital role of women and youth in environment management and development must be recognised and their full participation therein must be promoted.	The Public Participation Process will endeavour to include the participation of all role-players including women and youth in this project. Communication with the public (Including women and the youth) will continue through to the construction and operational stages of the project through the provisions that will be made in the EMPr to appoint a community liaison officer. Employment equity will also be an important part of the NPP project moving forward in terms of providing work to local communities and to Previously Disadvantaged Individuals (including women).
(4) (r) Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.	This principle will be upheld in this EIA. The alternative sites for the NPP occur along the coast and therefore, by definition, occur in sensitive environments. Both Bantamsklip and Thyspunt support ecologically important habitat within largely natural coastal landscapes, and both Project Areas of Influence (PAOIs) contain receptors that are sensitive to large-footprint, long-duration infrastructure such as a NPP and its associated roads, servitudes, yard infrastructure and security footprint. Across both sites, the receiving environment includes threatened/under-protected ecosystem types, CBA features, KBA context and/or proximity to conservation areas, meaning that the project will need to be taken forward on the basis of a strict mitigation hierarchy with strong emphasis on avoidance and footprint discipline, followed by minimisation, rehabilitation/restoration, and offsets where residual impacts remain. The approach to the S&EIR process and the specialist studies takes cognisance of these sensitive systems and appropriate management and mitigation measures have been recommended to ensure that these systems are able to continue to function as optimally as possible. The management of the chosen site as a nature reserve would provide further protection to the natural systems during the operational phase.

8 BASELINE ENVIRONMENT

The Bantamsklip and Thyspunt sites have been assessed previously as potential locations for Eskom's NPP as part of Gibb's 2013 EIA. There is therefore a lot of baseline information available for these two sites. The baseline information informing this chapter has been sourced and referenced from previous specialist studies as well as from current (2026) scoping phase specialist studies and assessments. In some cases, the baseline conditions at these two sites recorded over 12 years ago (2008 – 2013) have changed, but for most, remain similar to what has been reported on historically.

8.1 PHYSICAL ENVIRONMENT

8.1.1 GEOLOGY

8.1.1.1 Bantamsklip

This section describes the physiography, geological history, stratigraphy, and tectonic characteristics of the Bantamsklip site within a 320 km radius (Figure 8-1).

In this region, the 'coastal rim' mainly includes the Cape Fold Belt and the Coastal Belt. Seaward, the subcontinent features a distinct continental shelf. South Africa's relatively simple geomorphology is due to its stable continental crust.

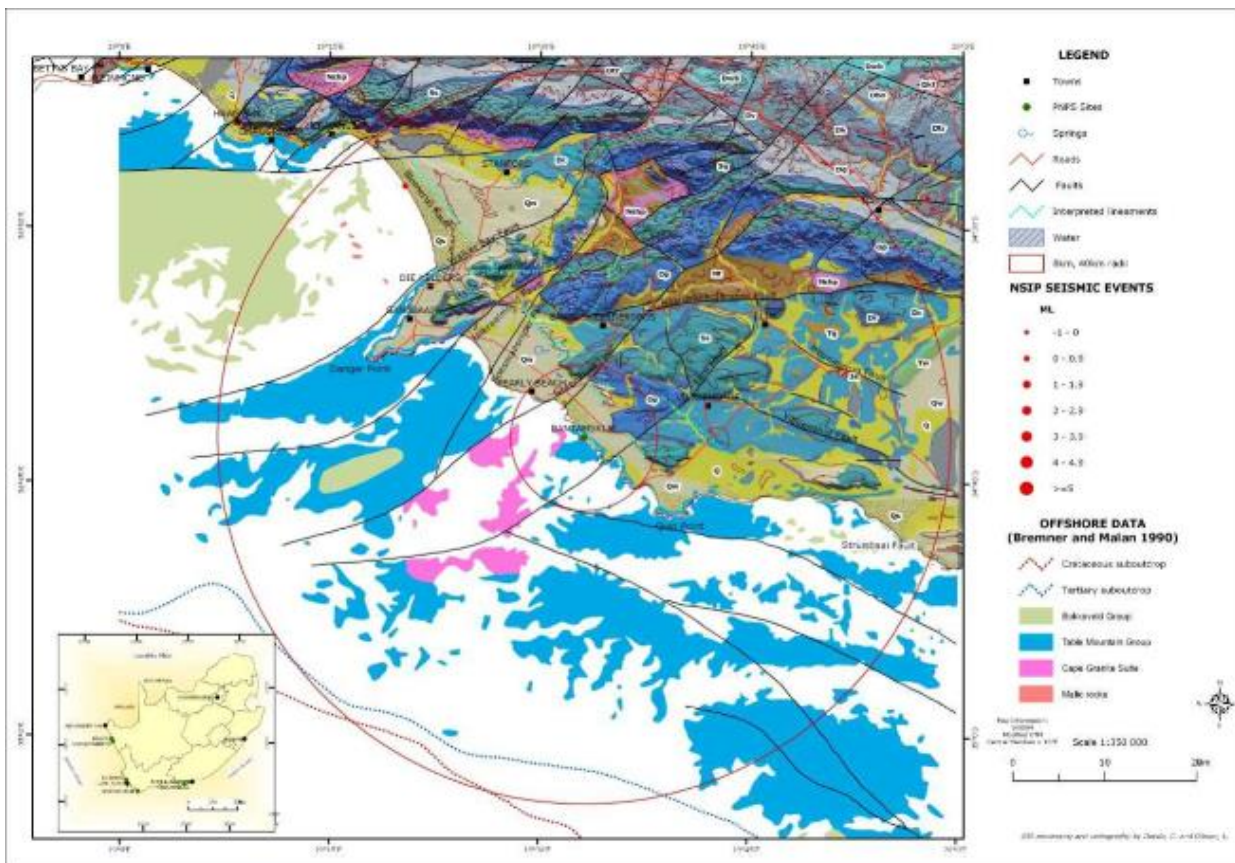


Figure 8-1 – Geologic Map of Onshore and Offshore Site Vicinity and Site Area. Eskom SSV Geology 2014

Geologically, the Bantamsklip site exhibits several notable features. The thickness of the soil profile varies considerably inland, starting at 0 m at the shoreline and reaching up to approximately 60 m within the dune region. Soil characteristics are generally uniform throughout the area, though calcrete zones occasionally appear. Beneath the site lies an intergranular aquifer; the groundwater table can be observed at the sea, while its depth fluctuates within the dunes¹⁷³.

The soils are non-cohesive and, when saturated, and would require innovative slope stabilisation techniques during excavation. Two principal geological formations underlie these soils: the Skurweberg Formation near the coastline and the Goudini Formation further inland. The quartzitic sandstone of the Skurweberg Formation is harder and more resistant to erosion compared to the carbonaceous sandstone in the Goudini Formation. Additionally, within the Goudini Formation, there is historical erosion depression containing cobbles, and this cobble layer channels groundwater flow toward the southeast.

Physiography

The coastline comprises rugged outcrops and gullies composed primarily of well-bedded quartz arenites from the Table Mountain Group (TMG), interspersed with occasional granite formations and relatively brief segments of sandy beach. A flat coastal terrace, characterised by white sand and grassy vegetation, is situated between the rocky shoreline and the initial line of dunes¹⁷³.

Site Stratigraphy and Lithology

The bedding along the coastline consistently strikes northeast, with dips between 18° and 30° southeast. Localised cross folding is minor. Quartz-filled bedding planes show shearing or brecciation, likely from flexural slip folding. Except for coastal exposures, bedrock is covered by fine- to medium-grained shelly sand. Tidal beach sand transitions inland to a narrow vegetated dune strip (<100 m), leading to the first Strandveld dunes. The calcareous sand of this formation overlies semi-consolidated to lithified calcarenite of the Waenhuiskrans Formation, which is partly exposed near the Bantamsklip site (M.J. Mountain & Partners (1988) as cited by Eskom Geology SSR, 2014).

The structural characteristics of the Cambrian and Precambrian basement rocks within the region are largely obscured by Palaeozoic cover rocks. Exposures of basement rocks occur in fault-bounded blocks northeast of Uilkraalmond and north of Elim, where several generations of cleavage and pervasive quartz veining are evident (De Beer 2001, as cited by Eskom's Geology SSR, 2014).

The Bantamsklip fault, or fault-zone, is approximately 50 m wide and is situated some 100 m north-west of the Bantamsklip site Location (De Beer 2001, as cited by Eskom's Geology SSR, 2014).

8.1.1.2 Thyspunt

The Thyspunt site's geology reflects that of most southeastern Cape coastal areas, featuring a broad, elevated marine platform from the Miocene and Pliocene periods atop older rocks. Precambrian rocks, such as the Gamtoos Group and Cape Granites, do not outcrop but form the basement beneath mapped formations. The TMG, mainly supermature quartzose sandstone deposited in Ordovician-Silurian times by marine, glacial, and fluvial processes, unconformably overlays the Gamtoos Group. It is succeeded by the argillaceous Bokkeveld Group, with the basal Ceres Subgroup north of St. Francis Bay. The Cape Supergroup underwent significant deformation

during the Permo-Triassic Cape Orogeny, creating the Cape Fold Belt mountains through widespread flexural-slip folding and stratigraphic décollement¹⁷⁴.

The Ordovician Peninsula Formation stands out as the most noticeable feature in the area, both in terms of its aerial coverage, stratigraphic layers, and topographical impact. Across the landscape, this formation appears as mountain ranges running west-northwest to east-southeast in the Kareedouw and Suurany's mountains, which are located west of Humansdorp. It also forms linear ridges and elevated areas inland, as well as a rugged coastline stretching from Thysbaai to Seal Point (Figure 8-3) (Goedhart et al. 2008 as cited by Eskom Geology SSR, 2015¹⁷⁵).

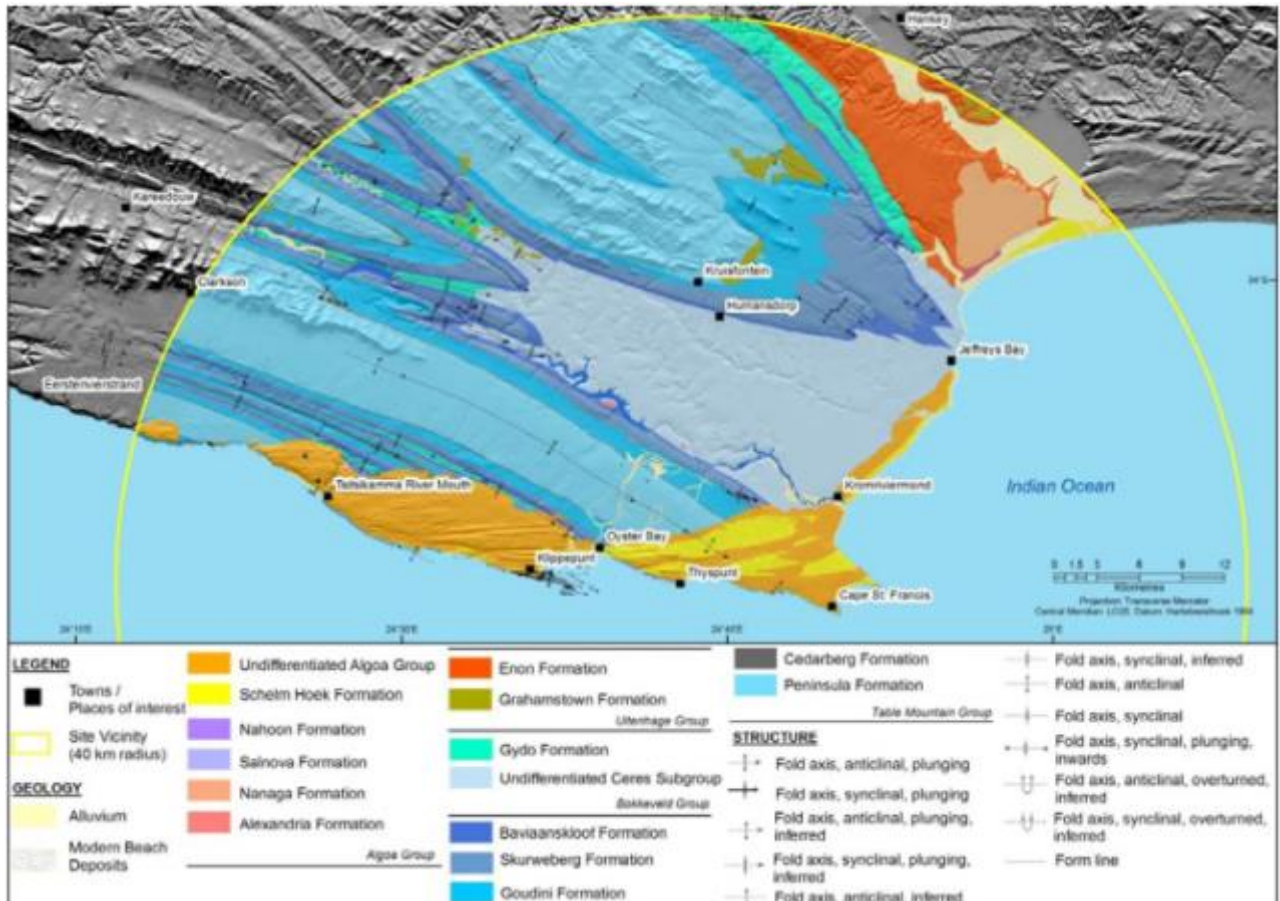


Figure 8-3 – Geology of the Thyspunt Site Vicinity (Goedhart et al, 2008 as cited by Eskom Geology SSR, 2015)

¹⁷⁴ FEIR, Gibb, 2016.

¹⁷⁵ Eskom Site Safety Report – Thyspunt, 2015

8.1.2 SOILS AND AGRICULTURAL POTENTIAL

The agriculture baseline information has been supplemented from Soil ZA's Agricultural Impact Assessment, Scoping Phase Report¹⁷⁶.

8.1.2.1 Bantamsklip

The climate in this area is described as arid, steppe, and cold with a climate capability of 5-7 (moderate to high). The terrain is described as a coastal plain with ridges with a slope gradient of 0-5% at an altitude of 26 m (Figure 8-4).

The geology is Dunes and blown sand of the Strandveld Formation, Bredasdorp Group (Ha17) and Ha37, with mainly yellowish redistributed sand with red dune cordon sand of the Berea Formation, and small areas blown sand. These are moderately deep to deep sandy soils of the Fernwood form. The soil classification is 3-6 (low to moderate) with a poor water holding and nutrient content. There is no agricultural land use on site but there are rain fed planted pastures in the surrounding area.

The site has a long term grazing capacity of 30 and a low (6) to moderate (10) land capability and the site is not located within a protected agricultural area¹⁷⁶.

Soil ZA provide a detailed breakdown of what the present agricultural potential is at the Bantamsklip site. In summary, Figure 8-4, taken from Soil ZA's scoping report show the typical conditions on the Bantamsklip site.



Figure 8-4 – Typical site conditions on the Bantamsklip site. Soil ZA, 2026

The Bantamsklip site is located on Very High, High and Medium Agricultural land, according to the DFFE Screening Tool¹⁷⁷ (Figure 8-5). The site is unsuitable for crop production, so its actual sensitivity is low. The agricultural specialist disputes the screening tool's high sensitivity rating and confirms the site's low agricultural sensitivity based on cropping potential¹⁷⁶.

¹⁷⁶ Agricultural Impact assessment- Scoping Phase. Soil ZA, 2026

¹⁷⁷ DFFE Screening Tool – Bantamsklip

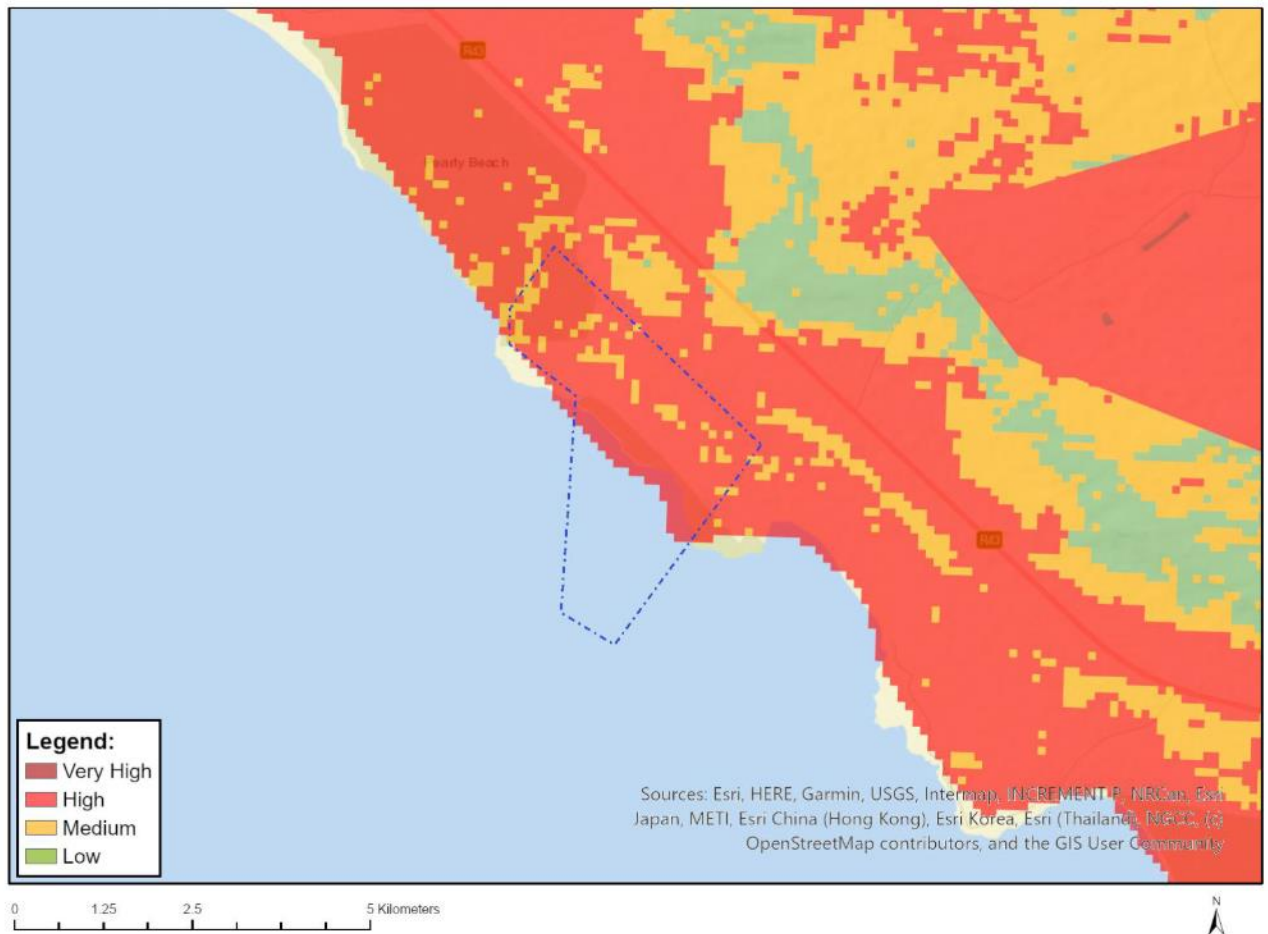


Figure 8-5 – Agricultural sensitivity – DFFE Screening Tool, 2026

8.1.2.2 Thyspunt

The terrain on the Thyspunt site is described plains with ridges with a gradient of 0 to 4% at an altitude of 120m. the terrain capability is classified as moderate to moderately high (5-6). The geology is comprised of Quartzitic sandstone, feldspathic sandstone and subordinate shale of the TMG with some influence of shale and siltstone of the Bokkeveld Group, aeolianite of the Nanaga Formation and aeolian sand.

The land type is Ha47 and the soils are deep sandy soils with underlying rock. The dominant soil forms are Fernwood, Constantia and Clovelly with a soil capability classification of 3 out of 9 (low). The soil has a low water holding capacity.

In terms of agriculture in the surrounding area, there are rainfed planted pastures with pivot irrigation in the surrounding area. The long-term grazing capacity of the site in question is rated as 6, with a land capability classification of 7/8 out of 15 (moderate). The site is within the Tsitsikamma Protected Area which holds a Very High agricultural sensitivity, rated as Category A¹⁷⁶.

Typical site conditions at the Thyspunt site are illustrated in Figure 8-6.



Figure 8-6 – Typical site conditions on the Thyspunt inland site. Soil ZA, 2026

Similarly, the Agricultural Impact Assessment undertaken for the 2012 EIA, indicated that there was then no agricultural production on the proposed site (Golder Associates as referenced by Gibb, 2012). However, considering the existing land use on farms to the north, there was potential for future agricultural development in this area, particularly through the allocation of planted pastures for dairy production in the northern section.

In 2012, no agricultural activities occurred within the 800 m emergency zone. The 3 km emergency zone borders a dairy farm on the northern side of the proposed site but did not impact ongoing agricultural operations. The area north of the site was regarded as a key region for dairy production, with pasture land then valued at approximately R 20,000–25,000 per hectare¹⁷⁴.

Land use within a 20 km radius of the Nuclear-1 site was predominantly commercial dairy farming, accounting for about 65% of the total land area. Strandveld (thicket) vegetation lines the coastline alongside significant stretches of bare sand dunes (the Sand River). Residential areas include Humansdorp, St. Francis, Cape St. Francis, and Oyster Bay, with Humansdorp being the most populated due to the other towns' predominance of seasonally occupied holiday homes. Figure 8-7 highlighted a substantial area of land degradation, mainly attributed to wind erosion and possibly historical overgrazing. The remaining landscape was generally well vegetated¹⁷⁴.



Figure 8-7 – Thyspunt Land-Use Map. Gibb, 2016

Agricultural production in the area

The Thyspunt area primarily features dairy farms, within a 16 km radius of the proposed site. Local dairies such as Woodlands, Parmalat, Nestlé, and Clover received milk from these farms, with Woodlands and Clover producing about 700 000 litres daily (in 2010) and manufactured products like cheese, butter, and yoghurt.

Dairy farms mainly used cultivated pastures and maize for silage, while much of the area's natural vegetation was shrubland with some alien invasive outcrops. Many farms produced silage for their own needs or to sell to others¹⁷⁴.

From the data gathered in the 2010 Agricultural Impact Assessment (Golder 2010) the Thyspunt area was predominately a dairy-producing area with dairy production on 16 of the 26 properties within a 20 km radius of the proposed site¹⁷⁴.

Sensitivity

Because the site is not suitable for viable crop production, its true sensitivity, as assessed on the ground, is medium. The agricultural specialist, therefore, disputes the very high sensitivity classification of the site by the screening tool (Figure 8-8) and verifies the entire site as being of medium agricultural sensitivity because of its assessed cropping potential¹⁷⁶.

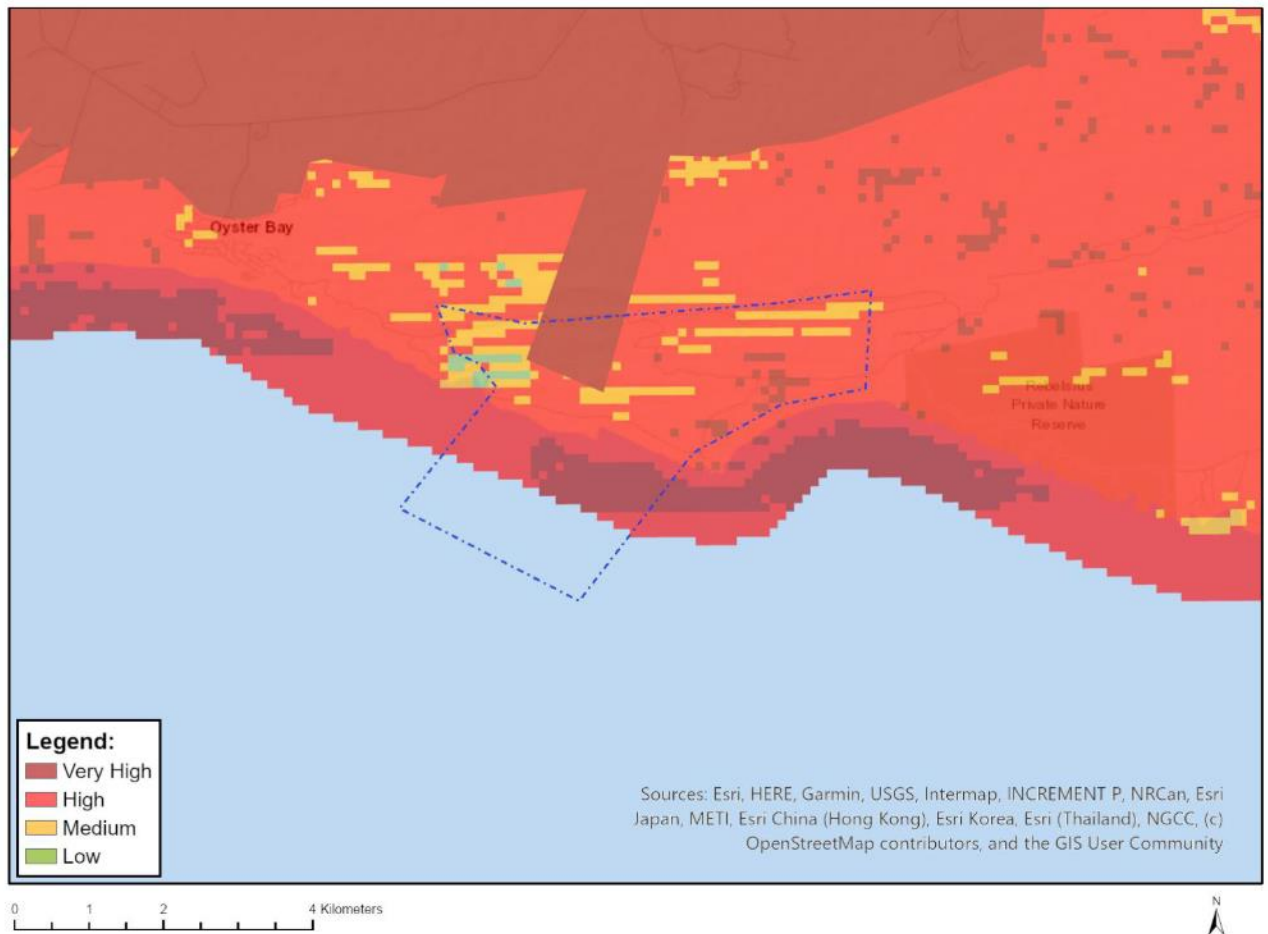


Figure 8-8 – Agricultural sensitivity – DFFE Screening Tool, 2026

8.1.3 SEISMOLOGICAL RISK

The baseline information informing this chapter has been sourced from Gibb's 2016 FEIR¹⁷⁴ and WSP's 2026 Geotechnical Assessment¹⁷⁸. The subsequent sections reference Figure 8-9 and Figure 8-10.

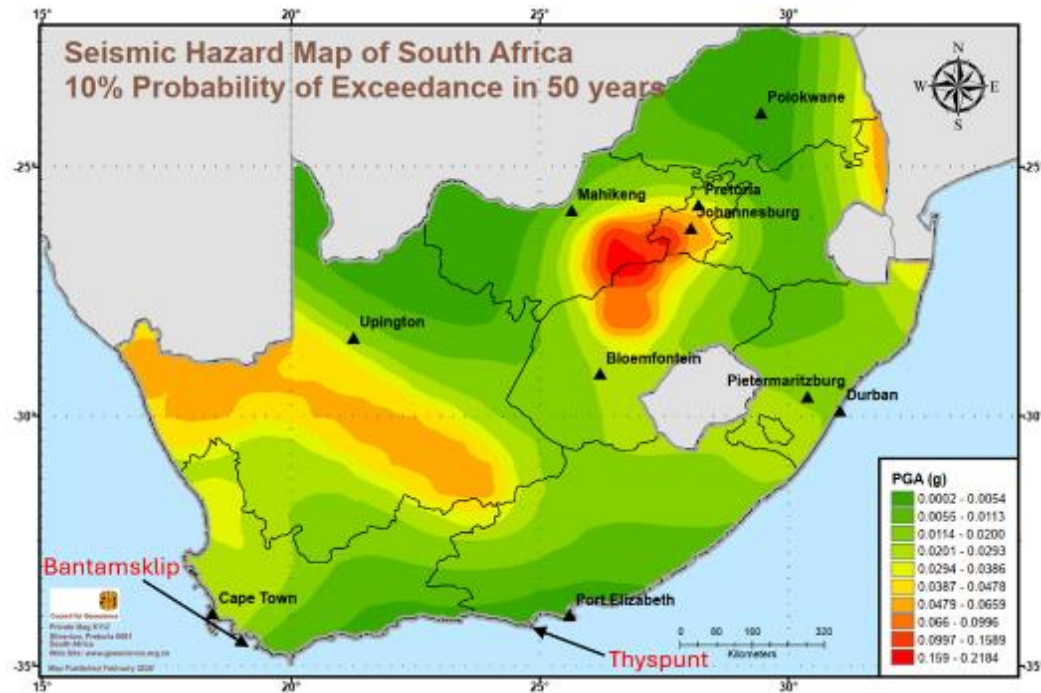


Figure 8-9 – Probabilistic Seismic Hazard Map of South Africa. WSP, 2026

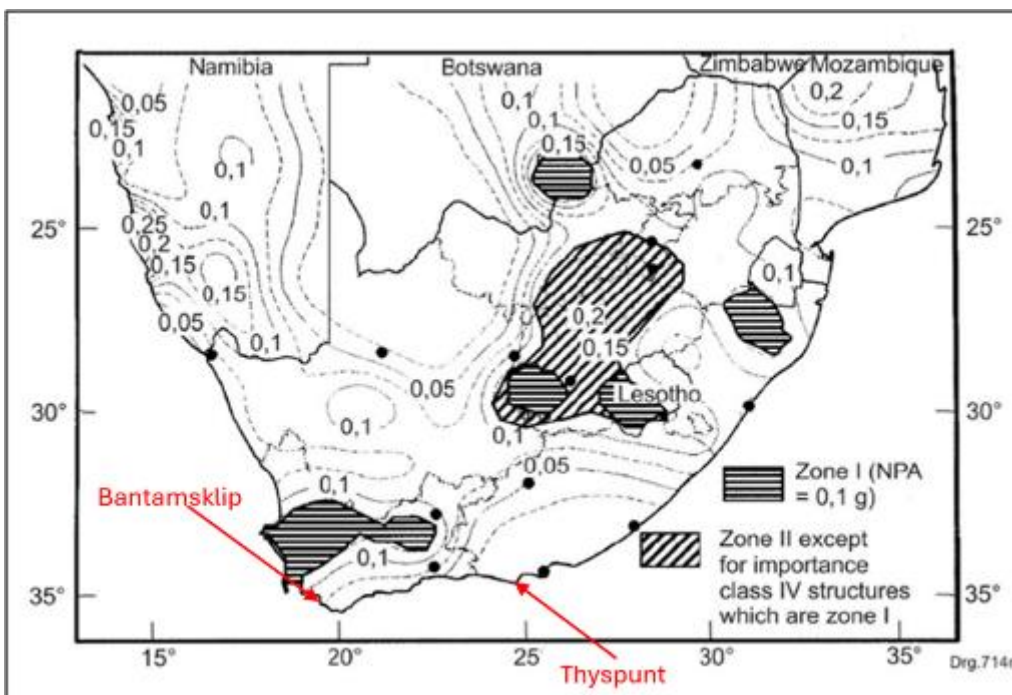


Figure 8-10 – Seismic zones of South Africa. WSP, 2026

8.1.3.1 Bantamsklip

Bantamsklip has a probabilistic seismic hazard between 0.0055 and 0.0113 g. The proposed Bantamsklip site, also, does not fall within any of the defined seismic activity zones. Accordingly, the site is expected to be subject to low levels of seismic hazard¹⁷⁸.

8.1.3.2 Thyspunt

Thyspunt has a probabilistic seismic hazard ranging from 0.0002 to 0.0054 g. In accordance with the seismic zoning defined in SANS 10160-4, the site does not fall within any designated seismic zone. This indicates that the area is expected to experience low levels of seismic hazard¹⁷⁸.

The Humansdorp-Thyspunt area has fewer faults than other parts of the Cape Fold Belt. The nearest major on-land faults, Gamtoos and Kouga, are 39–45 km and 42 km from the site. Offshore, two potentially hazardous faults lie within 40 km, including the Plettenberg fault, which is 18 km away and stretches 100 km with a 5600 m throw.

Seismic Hazard Analysis by CGS shows Thyspunt's baseline PGA is 0.16 g. The site has the largest margin for change compared to others. For reference, SANS 10 160 recommends a design PGA under 0.05 g for industrial buildings at Thyspunt¹⁷⁴

8.1.4 GEOTECHNICAL

The geological baseline information that has been presented in previous specialist study remains relevant to the site and study area. The baseline information in this chapter has been sourced from the Gibb 2016 FEIR¹⁷⁴, Eskom's Site Sensitivity Reports^{175,178} and WSP's Geotechnical Assessment Scoping Report, 2026¹⁷⁸.

The geotechnical sensitivity rating of the proposed Thyspunt site and Bantamsklip site was verified to be "Low"¹⁷⁸.

8.1.4.1 Bantamsklip

The site lies on TMG rocks of the Cape Supergroup, covered by Quaternary deposits from the Bredasdorp Group (Figure 8-11). The Peninsula Formation is mostly hard quartzitic sandstone with minor shale, but becomes soft and brittle when weathered, dipping 25°–30° NE. Above are vegetated, semi-consolidated calcarenite dunes and unconsolidated sand. Two faults run nearby: Donkergat Fault (3 km NE) and Elim Fault (800 m SE)¹⁷⁸.

¹⁷⁸ Geotechnical Assessment Scoping Report. WSP, 2026



Figure 8-11 – Geological Map of the Bantamsklip area. WSP, 2026

8.1.4.2 Thyspunt

The 1:250 000 geological map (Sheet 3324 Port Elizabeth) shows that the site is underlain by TMG rocks of the Cape Supergroup, covered by Quaternary deposits (Figure 8-12). The area features steeply folded and faulted sandstones, siltstones, and shales from the Table Mountain and Bokkeveld Groups, with Cretaceous sediments filling nearby coastal embayment's. At Thyspunt, quartzitic sandstones dominate, dipping 35°–55° south-southwest, overlain by aeolianite and sand dunes. The onshore area lacks major faults, but offshore faults include the Plettenberg Fault (18 km south) and Cape St Francis Fault (16 km southeast)¹⁷³.

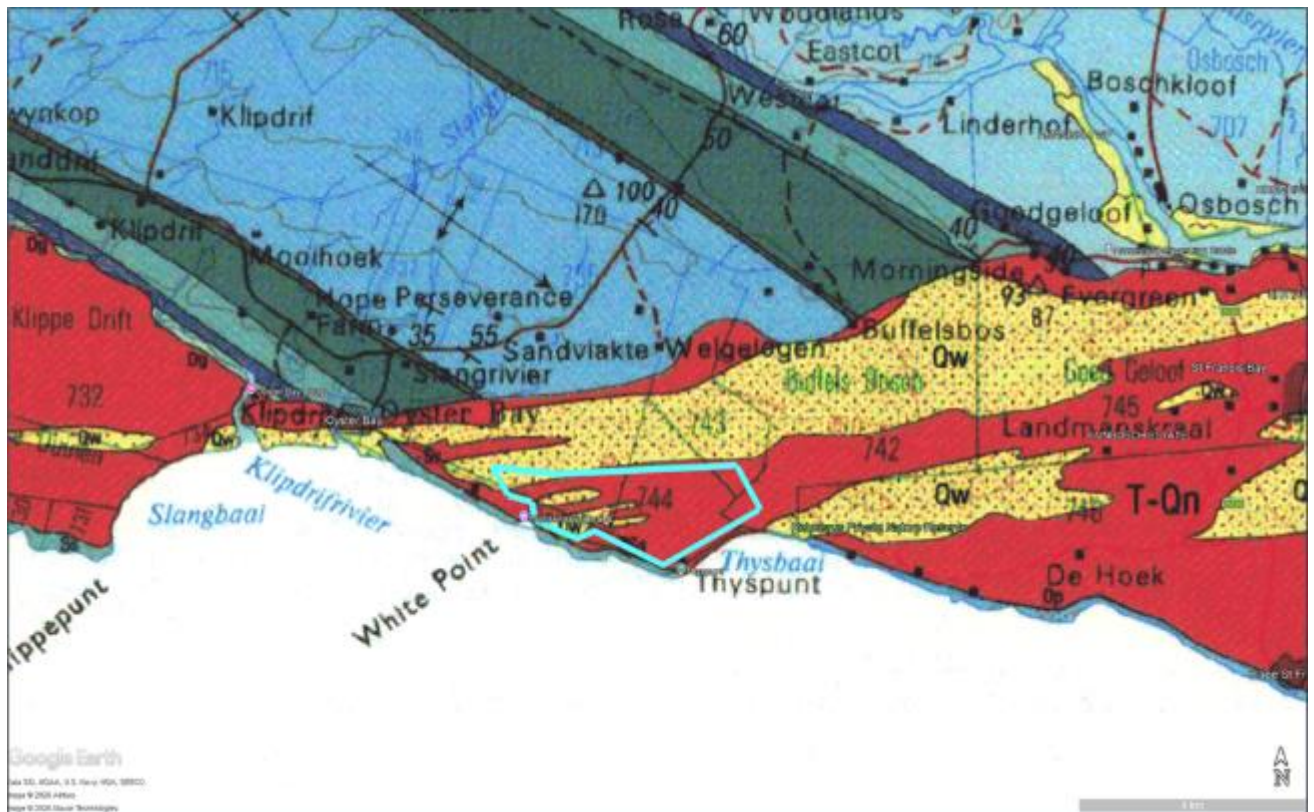


Figure 8-12 – Geological Map of the Thyspunt Area. WSP, 2026

8.1.5 DUNE GEOMORPHOLOGY

The baseline information informing this chapter has been informed by the Nuclear 1 FEIR and the Dune Geomorphology Scoping Phase specialist study compiled by Illenberger & Associates, 2026¹⁷⁹.

8.1.5.1 Bantamsklip

Transgressive dune fields in the Bantamsklip area are mainly transverse dunes, stabilised largely with Rooikrans and some indigenous vegetation. There are no active dunes on the site; only older, naturally vegetated fossil parabolic dunes from the previous interglacial period (~120,000 years ago). Groundwater does not surface, so dune dynamics here are unaffected by groundwater¹⁷⁹.

Geomorphologic conservation value at Bantamsklip is low, as there are many similar dunefields elsewhere that remain largely unaffected¹⁷⁹. Figure 8-13 provides a photo of one of the artificially vegetated transverse dunes at Bantamsklip¹⁷⁹.

¹⁷⁹ Dune Geomorphology Scoping Phase. Illenberger & Associates, 2026



Figure 8-13 – Artificially vegetated transverse dunes at Bantamsklip

From a dune geomorphology perspective, it would be practical to construct the NPP and related infrastructure on these dunefields with minimal operational impact post-rehabilitation¹⁷⁹.

8.1.5.2 Thyspunt

Thyspunt features mobile headland-bypass dunes (Oyster Bay dunefield), vegetated parabolic dunes, hairpin parabolic dunes, and long vegetated ridges formed by former mobile dunes. Some areas are stabilized with alien vegetation like Rooikrans. Groundwater in this area surfaces in interdune zones, forming ponds and wetlands. Figure 8-14 provides a photo of these dunes.



Figure 8-14 – Steep ridges formed by arms of parabolic dunes. Illenberg & Associates, 2026.

The headland-bypass dunefields at Thyspunt have significant geomorphological conservation value as they are South Africa's last large, active examples of this type of dunefield. These dunefields are unique locally, regionally, and likely globally¹⁷⁹. The site offers important insights into coastal dune dynamics due to its almost pristine Holocene and Pleistocene dune ridges and diverse formations.

Cape St. Francis headland features the last two active large-scale mobile headland-bypass dune fields on the south coast of South Africa (Figure 8-15). These corridors of transverse dunes align with the prevailing westerly to south-westerly winds, creating highly dynamic dune systems. A notable characteristic of the Cape St. Francis dune fields is the development of pans, typically 1–2 meters deep, within interdune areas following periods of significant rainfall.

The eastern section of the dune field is drained by the Sand River, which flows intermittently during high rainfall, facilitating the transport of substantial volumes of sand to the Kromme estuary. Sand migration occurs predominantly from west to east as a result of the prevailing wind direction.

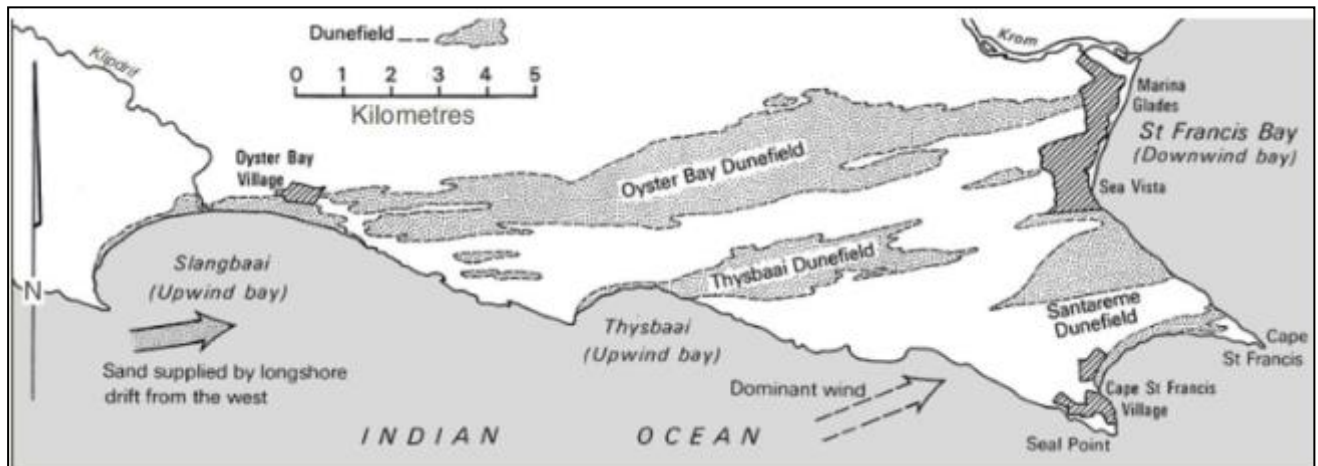


Figure 8-15 – Illustration of the original St. Francis headland bypass dune field system. Illenberger & Burkinshaw (2008) as cited by Gibb, 2016

Dune height varies across the field, averaging 20 m in the west and gradually decreasing to approximately 5 meters in the east.

The Sand River originates in farmland north of the dunefield. Its eastern side, with a steeper slope and smaller dunes, allows fast flow and easier channel maintenance due to strong erosion and less sand to move. It discharges into the Kromme Estuary, flowing only after heavy rain and often continuing for months during wet periods. The dunefield's dynamics differ between the eastern and western sectors.

In the central dunefield (Figure 8-16), there is no surface flow; instead, discrete interdune ponds appear during rainy periods¹⁷⁹.



Figure 8-16 – Slopes of the interdune surfaces in the Oyster Bay dunefield. Illenberg & Associates, 2026

One relatively permanent river channel, the Penny Sands River (Figure 8-17), exists in the westward-sloping part of the dunefield, where it disappears into the high dunes. This area is classified as a "channelled valley bottom wetland" (Day, 2009, cited by Illenberg & Associates, 2026). Other short channels appear briefly during heavy rainfall. The dunefield's dynamics differ between its eastern and western sectors¹⁷⁹ (Figure 8-18).



Figure 8-17 – Penny Sands River. Illenberg & Associates, 2026

Other short channels appear briefly during heavy rainfall in this area. The dunefield's dynamics differ between its eastern and western sectors¹⁷⁹ (Figure 8-18).



Figure 8-18 – Surface flow in the Oyster Bay dunefield. Illenberg & Associates, 2026

Groundwater and Dune geomorphology

In areas where the dune sand is thick, such as in the vegetated dunefield between the Oyster Bay dunefield and the sea, groundwater does not reach the surface. The dune sand and lightly cemented dune rock is porous. It thus allows free passage of groundwater, both downward to the contact between the dunefield and the TMG, and along the contact in a down-slope direction, i.e. southward (SRK, 2009 as cited by Illenberg & Associates, 2026).

The groundwater flow reaches the surface (“daylights”) to form wetlands in areas where the dune sand has been blown out to expose the erosional base level over which the dunefields have moved. The erosional base level is possibly the bedrock surface of the TMG. Fines accumulating against the east-west trending dune ridges may create a perched groundwater table along this southern margin¹⁷⁹.

Geomorphological Risk

During public review of the Draft EIR of the 2010 EIA (March–June 2010), concerns were raised from the public about potential debris flows at Thyspunt, backed by observations of Sand River deposits and previous flood events. While Prof. Fred Ellery presented evidence suggesting such

risks, specialist reviews, including those by Dr. Werner Illenberger and others, found no support for debris flow threats to this site. Key findings include:

- Steep slopes in the area are made of sand, which absorbs water and cannot generate debris flows.
- The Sand River's gradient is too shallow to sustain such flows.
- Field investigations and image analyses have not identified any true debris flow deposits; observed sediments are consistent with typical river flood deposits.
- Local conditions do not favour debris flow formation, so they do not pose a risk to future infrastructure.

Stakeholders expressed concern that liquefaction in mobile dune fields could create quicksand and threaten access roads. Studies confirm that quicksand can form in the Oyster Bay dunes during wet periods, but vehicles are only at risk if driven on the Sand River bed or near interdune ponds. Roads like the R330 are safe from the risk of quicksand. Proposed new routes could be engineered to account for geotechnical risks, and the nuclear power station itself would be constructed on solid rock, negating issues from liquefaction.

8.1.6 HYDROLOGY

The hydrology baseline information has been sourced from SRK's Hydrology Study, 2026¹⁸⁰.

8.1.6.1 Bantamsklip

The Bantamsklip site is situated along the coastline approximately midway between Danger Point and Quoin Point. It is positioned within quaternary catchment G50A and lies in the Breede Water Management Area. The G50A_BT7 and G50A_BT8 catchments lack defined watercourses, with surface water draining north of the proposed site (Figure 8-19). These catchments feature well-drained, undulating sandy soils that discharge into the Atlantic Ocean during extreme storms¹⁷⁹.

The topography is predominantly flat, gently sloping towards the coast. Both ancient dunes stabilised by vegetation and unconsolidated Recent-age dunes less than 10 meters in height are present along the shore. The section of the site located along and southwest of the tar road exists on a coastal plain at elevations ranging from 25 to 50 meters above mean sea level (amsl), while the landscape ascends north-eastward to heights between 150 and 200 meters amsl. The coastal strip features a wave-cut platform developed on bedrock, visible only as a narrow rocky belt at the high-tide mark; further southeast, the coastal belt transitions to sandy terrain with minimal rock exposure.

No river channels directly drain the site due to highly permeable sandy soils. However, the perennial Hagelkraal, Koks, Wolfgat, and Ratel rivers serve the broader study area, with the Koks and Wolfgat rivers forming tributaries to the Ratel River. All rivers flow in a south-easterly direction toward the coast. Most minor streams along the coastline infiltrate into the flat sandy areas near the ocean, failing to maintain open river channels across the narrow, raised coastal dunes¹⁸⁰.

¹⁸⁰ Hydrology Study. S&EIR for Eskom's Proposed New Nuclear Sites: Scoping Report. SRK, 2026.

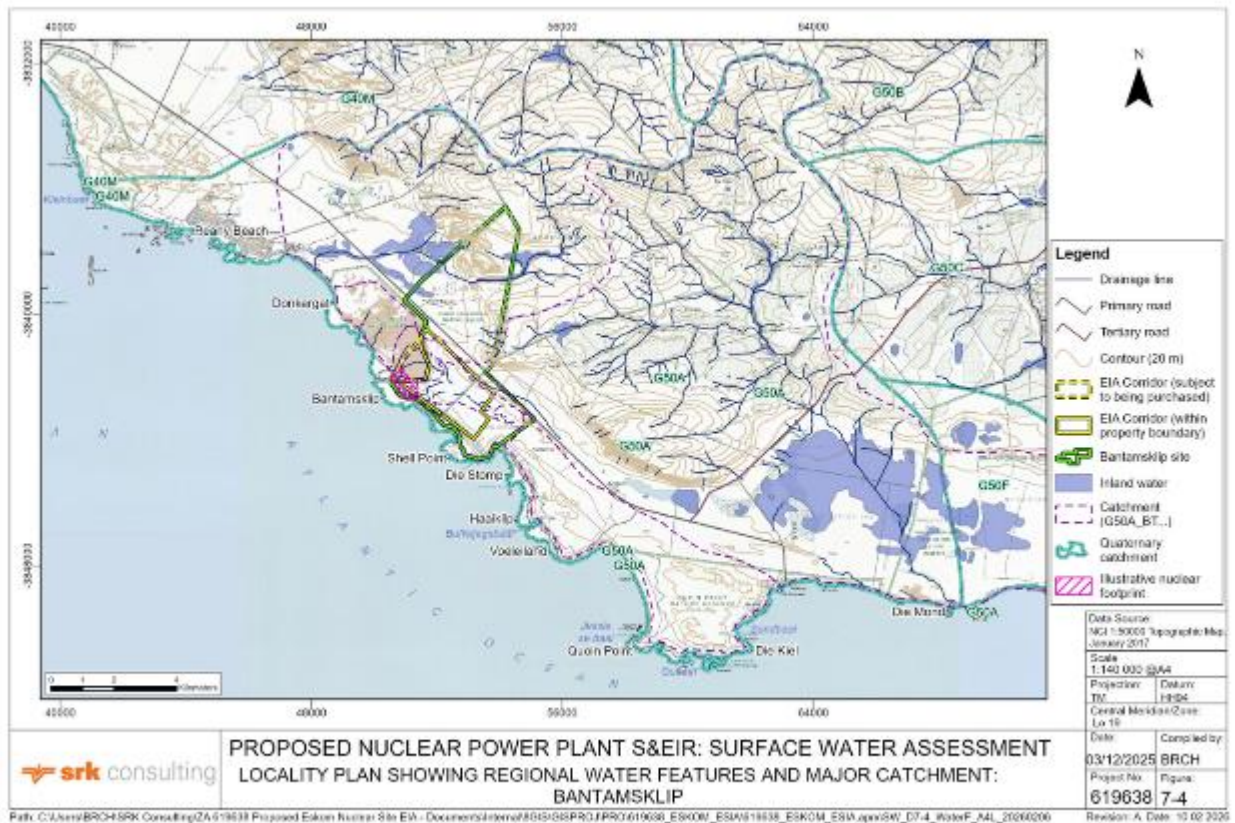


Figure 8-19 – Regional Water features - Bantamsklip. SRK, 2026

The site experiences a Mediterranean climate, characterised by dry summers and predominant winter rainfall, although precipitation can occur year-round. Average annual rainfall ranges between 400 and 600 mm per annum.

The immediate site lacks river channels due to the high permeability of sandy soils. Nonetheless, the broader study area is drained by the perennial Hagelkraal, Koks, Wolfgat, and Ratel rivers. The Koks and Wolfgat rivers serve as tributaries to the Ratel River, and all flow in a south-easterly direction toward the coast. Most smaller streams along the coastline infiltrate flat, sandy areas near the ocean and do not sustain open river channels across the narrow, elevated dunes bordering the coast.

Floodlines

No floodlines were determined due to the locality of the proposed site with respect to the topography and the resultant sub-catchment boundaries. The nearest major watercourse is the Haelkraal River mouth approximately 5 km northwest of the proposed site¹⁸⁰.

Site Sensitivity

At both sites the position of the NPP illustrative footprint needs to consider site sensitivity, however the final locality of the NPP would require remedial measures to manage external surface water from inland local catchments and the extreme high-water level from the sea. In addition, on site

formalised stormwater management would be required to ensure minimal negative impacts on the surrounding environment due to the development of the NPP¹⁸⁰.

8.1.6.2 Thyspunt

The site is about 12 km west of Cape St. Francis in South Africa's Eastern Cape Province, featuring marine, freshwater, and terrestrial habitats along the coastline between Oyster Bay and Cape St. Francis. It lies within catchment K80F, drained by the Klipdrif and Slang Rivers. Neighboring catchments K90D, K90E (drained by the Krom River), and K90F (drained by the Seekoei River) do not affect the site, as their runoff flows away from it (Figure 8-20).

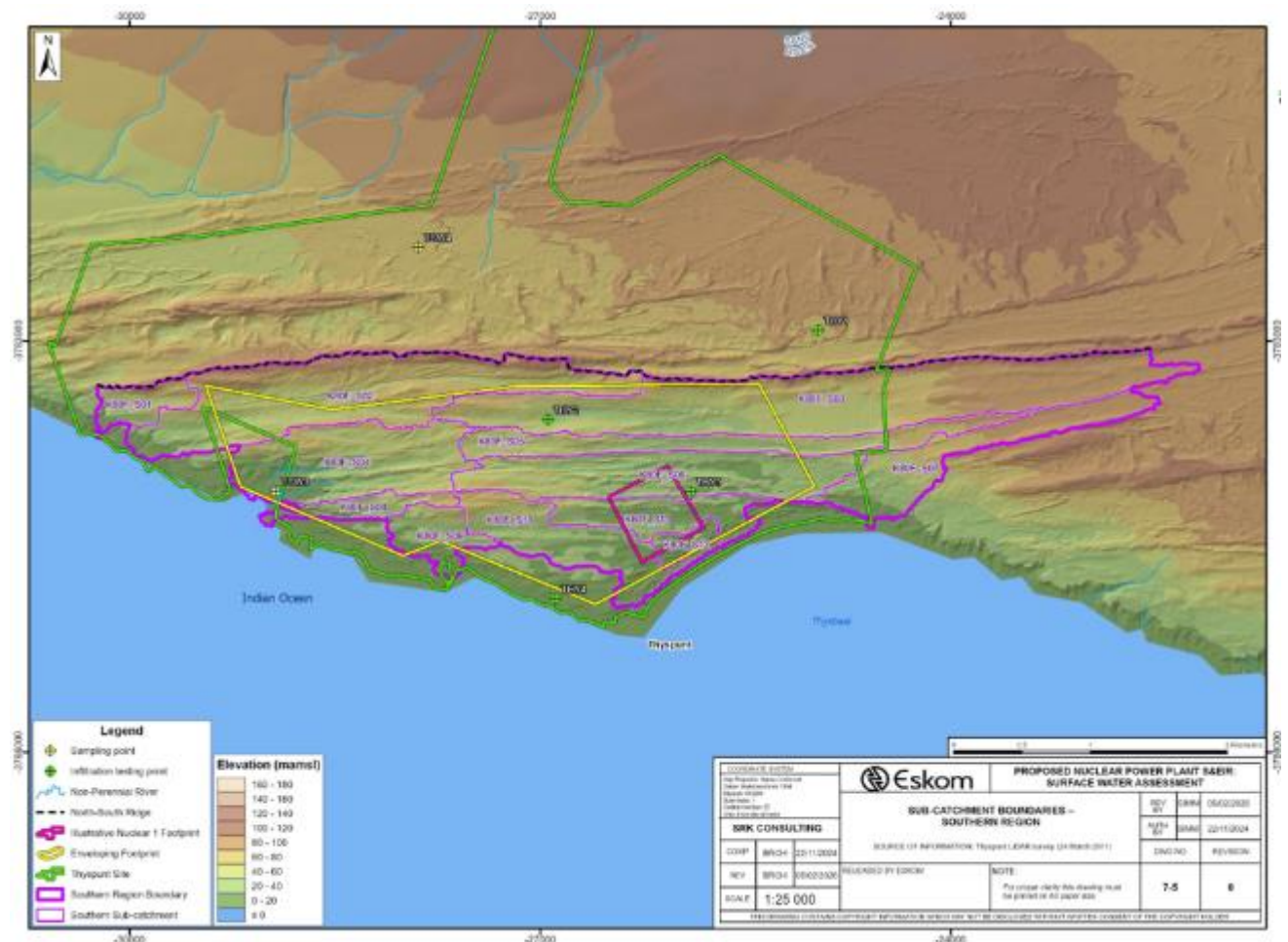


Figure 8-20 – Sub catchment Boundaries. SRK, 2026

Runoff occurs during high intensity rainfall events to the north/northeast of the site, draining eastwards away from the site. The Sand River and a smaller (unnamed) river drain towards the St. Francis Golf Course and would not impact on the proposed site but may impact the design of site access roads¹⁸⁰ (Figure 8-21).

There are no dams or well-defined watercourses identified could cause a safety threat to the site within the K80F quaternary catchment¹⁸⁰.

Regional peak flow conclusions based on baseline hydrology data were as follows:

- Storm events from 10-1 to 10-8 annual probability (95th percentile) reflect increased rainfall intensity due to climate change.

- Northern catchments drain towards dunes and are disconnected from Southern catchments, which drain towards the site.
- Five main vegetation types: Algoa Dune Strandveld, Southern Cape Dune Fynbos, Tsitsikama Sandstone Fynbos, Cape Seashore Vegetation, and Cape Lowland Freshwater Wetlands.
- Most local catchments show low runoff potential because sandy soils and moderate vegetation promote high infiltration, resulting in low peak flows.
- Small catchment sizes, limited rainfall, and high infiltration produce very low runoff peaks during minor storm events¹⁸⁰.

Sedimentation dynamics

The site is situated within small, localised catchments – characterised by low-lying areas – with the combined catchment area totalling less than 8 km². Consequently, runoff volumes and peak flow rates are minimal. There are no significant watercourses within the site boundary, and, due to the limited catchment sizes and high infiltration rates, only negligible sediment levels are anticipated within the affected footprint; thus, sediment is not considered a primary impact concern. The exact, localised position of the illustrative nuclear island footprint remains undetermined.

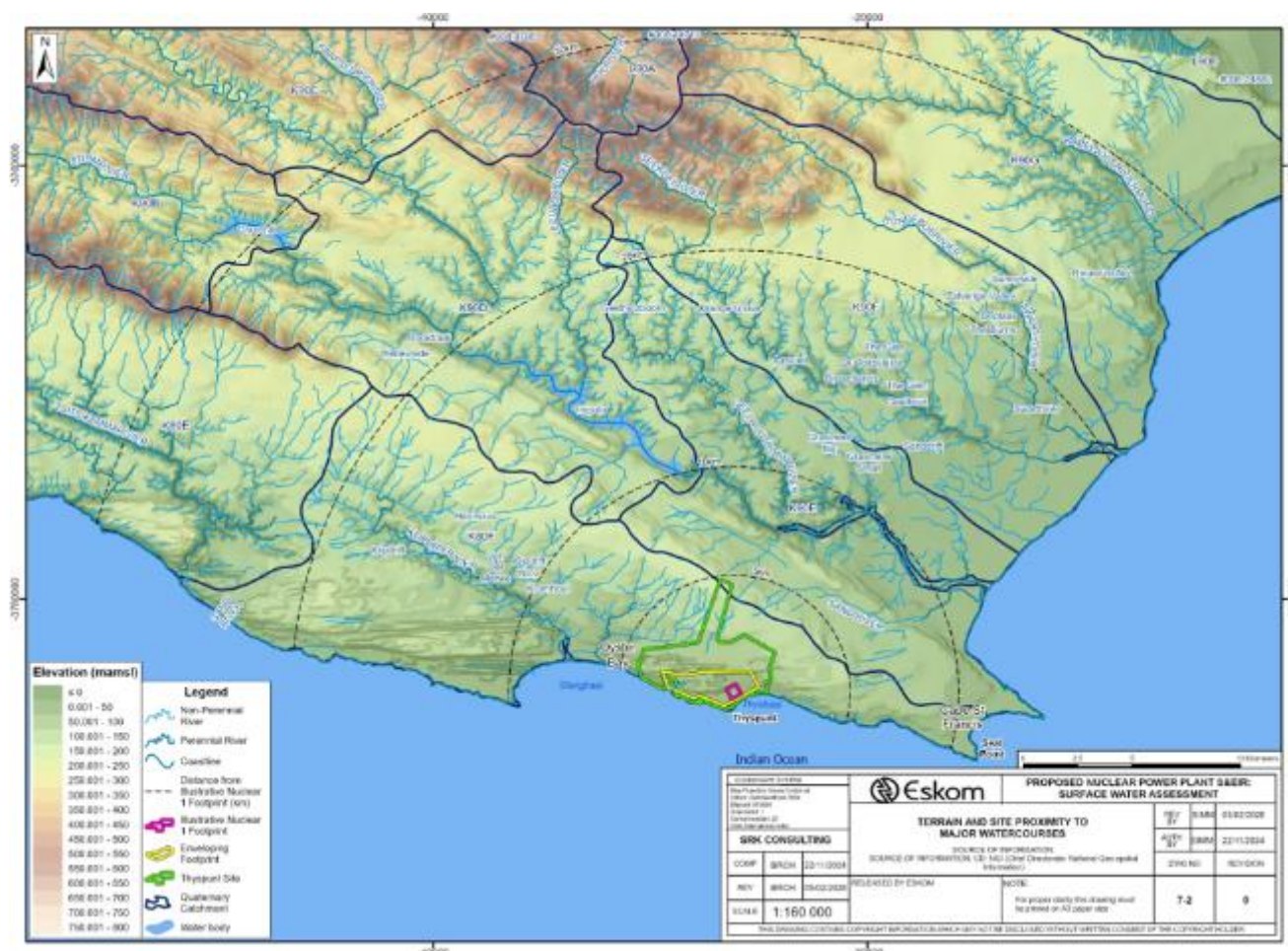


Figure 8-21 – Major watercourses in proximity to the Thyspunt site. SRK, 2026

The site is situated within the Fish to Tsitsikamma Water Management Area, specifically in the Krom-Seekoei sub-area as outlined by the Integrated Strategic Perspective (ISP) for the fish to the Tsitsikamma Water Management Area. The total yield from the sub-area has been calculated at

47.4 mm³ per annum after accounting for transfers and return flows, while user requirements amount to 46.2 mm³ per annum. This indicates that the water balance in the sub-area is approximately maintained, with a surplus of 1.2 mm³ attributed to excess capacity in the upper Krom River, which could potentially support the Nelson Mandela Metro¹⁷⁴.

Precipitation trends

The Intergovernmental Panel on Climate Change (IPCC) projects annual rainfall to decrease by about 30 mm (75th percentile) at the site by 2100. However, this does not necessarily apply to the changes in rainfall intensities, which may in fact, increase in this area¹⁸⁰.

Locally, the site encompasses multiple wetland areas, which are mainly sustained by groundwater inputs. Long-term precipitation records are available for Thyspunt, as gauges were installed in 2008. Pre 2008, data from nearby weather stations indicated a mean annual precipitation (MAP) ranging between 558 mm and 694 mm.

Site Sensitivity

According to the hydrologist, site sensitivity for pre-development areas at Thyspunt ranges from low to high. With the implementation of recommended remedial measures, including comprehensive stormwater management plans, site sensitivity may be considered, low¹⁸⁰.

8.1.7 GEOHYDROLOGY

The geohydrology baseline input has been sourced from SRK's 2026 Geohydrology Scoping report¹⁸¹.

The following general geohydrological conclusions are drawn for both sites:

- Being coastal sites, the nuclear footprint/island will be located near the end of the groundwater flow path, with no downstream groundwater users;
- The receiving environment/downstream receptor of any direct contamination will be the shore zone/sea;
- There is a dual aquifer system at each site comprising an upper unconfined intergranular aquifer and a lower semi-confined fractured rock aquifer. These aquifers are likely to be in hydraulic connection, with an upward component of flow in the fractured rock aquifer; and
- There are municipal and other groundwater supply schemes in relatively close proximity to both sites. Leaks of radioactivity would not affect such users directly. However, air emissions could be transported inland by prevailing winds and contaminate such groundwater by being incorporated into rainfall recharge¹⁸¹.

8.1.7.1 Bantamsklip

The site is situated within quaternary catchment G50A in the Breede Water Management Area (Figure 8-22). The region has been subdivided into five Groundwater Resource Units (GRUs), primarily based on geological characteristics, surface drainage patterns, bedrock topography, and

¹⁸¹ Geohydrology Study for Eskom's Proposed New Nuclear Sites: Scoping Report No: 619638/1: . SRK, 2026

groundwater flow regime, particularly for unconsolidated Cenozoic-age deposits. Specifically, the site is located in the G50A-1 GRU.

The G50A-1 GRU encompasses the area from the origin of the Hagelkraal River in the north-east to the coastline, including the Peninsula Formation outcrops along the shore. Its eastern boundary is delineated by the natural surface drainage divide between the Hagelkraal and Koks rivers. The GRU's predominant coverage consists of sediments from the Strandveld and Waenhuiskrans formations belonging to the Bredasdorp Group. In the northern section, the site partially overlaps with the Walker Bay Nature Reserve, which is administered by Cape Nature¹⁸¹.

The coastal plain is predominantly underlain by sediments of the Bredasdorp Group. These comprise semi-consolidated aeolian sands with calcrete lenses (Waenhuiskrans Formation), which were deposited on a wave-cut platform composed of TMG rocks. Unconsolidated sand containing shell fragments (Strandveld Formation) characterizes the beach zones.

The underlying bedrock consists of the Cape Granite Suite and TMG sandstone, both of which are generally considered secondary or fractured-rock aquifers. Groundwater flow and storage occur within secondary voids in the rock mass, such as joints, faults, and fractures. For the purposes of this assessment, these secondary aquifers are designated as the Granite Aquifer and TMG Aquifer, respectively. As these units are overlain by superficial deposits, the resulting aquifers are likely to exhibit semi-confined conditions.

The superficial deposits of the Bredasdorp Group are classified as a primary or intergranular aquifer, where groundwater movement and storage occur in the original pore spaces among the sediment grains. The water table forms the upper boundary of this unconfined aquifer, which is referred to here as the Bredasdorp Aquifer for the purposes of this specialist investigation¹⁸¹.

The Malmesbury Group is not exposed in the study area (Johnson et al., 2006). However, boreholes drilled during the geological investigation by the Atomic Energy Corporation (1989) along the main coastal tar road encountered blue-grey 'baked' shale, which is interpreted to be Malmesbury Group. It is assumed that the 'baked' or metamorphosed appearance of the shale is due to the proximity of the intrusive granite¹⁸¹.

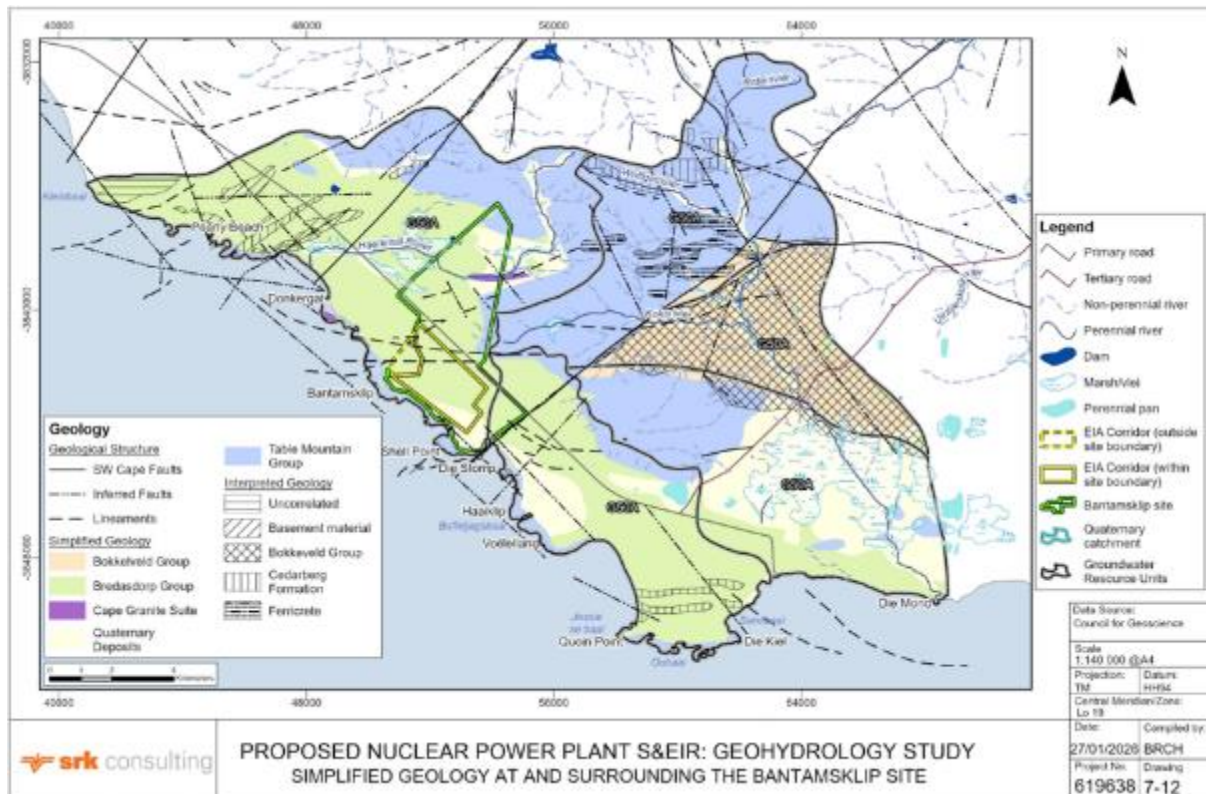


Figure 8-22 – Simplified Geohydrology Map surrounding the Bantamsklip site. SRK, 2026

Aquifers

Three aquifers have been identified at the proposed Bantamsklip site, the Bredasdorp Aquifer, the TMG Aquifer, and the Granite Aquifer. The Bredasdorp Group, consisting of semi-consolidated aeolian sand with calcrete lenses (Waenhuiskrans Formation), lies atop a wave-cut platform composed of TMG rocks. Along the beaches, unconsolidated sand containing shell fragments (Strandveld Formation). The thickness of the Waenhuiskrans Formation ranges from 4–6 meters at the coast to approximately 20 M at the R43 turn-off to Pearly Beach, and about 30 meters in the northeastern corner of the site. Groundwater levels in the Bredasdorp Aquifer ranged from c.3 mbgl close to the coast, to between c.7 and 8 mbgl inland and to between c.0 and 3 mbgl near the Hagelkraal River north of the R43¹⁸⁰.

The TMG consists mainly of quartzitic sandstone of the Peninsula Formation in the study area. These rocks are exposed along the coast and in the more elevated area to the north-east of Pearly Beach. Groundwater in the TMG Aquifer is generally of a deep-seated nature inland but on the coastal plain and wave-cut platform at the site the groundwater levels are within c.5 m of ground surface. Groundwater levels range between 2.6 mbgl (BP2) at the shoreline to 47.9 mbgl (BP16) further inland.

Outcrops of the Hermanus Granite Pluton occur at the Donkergat headland at the eastern edge of Pearly Beach and further inland along the Hagelkraal River on the farm Groot Hagelkraal. The granite body is composed of coarse-grained porphyritic granite interspersed with fine- to medium-grained biotite granite¹⁸¹. Groundwater was encountered in the three boreholes drilled into the Cape Granite Suite. At BP12 the initial groundwater level was at 6.86 mbgl while at BP13 groundwater

level was at 19.45 mbgl. At BP15 the groundwater level is at 4.06 mbgl. Further inland the depth of the groundwater in the granite is deeper, up to c.20 mbc.

Boreholes have been drilled into these aquifers for the sake of this assessment, their locations illustrated in Figure 8-23. The borehole yields were found to be low in this area. These are reported in detail in the SRK Geohydrology report¹⁸¹.

The recharge rate of the boreholes associated with the Bantamsklip site is considered “average” and is consistent with the recharge rates from other boreholes in the surrounding area.

Groundwater flow

The water table typically follows the land’s contours and is affected by major drainage features and dams. In the TMG region, inland groundwater tends to be found at greater depths (around 20 m below ground), but on the coastal plain and wave-cut platform near the site, it lies less than 5 m beneath the surface.

Local aquifers are either unconfined or semi-confined, with groundwater movement generally aligning with the slope of the land. Overall, water flows southwest toward the sea, shifting more directly south as it approaches the Hagelkraal River.

Groundwater Quality

Over most of the study area, groundwater quality in terms of EC is in the range of 70 to 300 mS/m. Better quality groundwater (EC <70 mS/m) is associated with the TMG in the mountains to the north.

Existing Groundwater Contamination

Based on site work carried out during this assessment, there appears to be no existing contamination at the site. As there are no existing contamination threats, the quality of groundwater at the site represents ambient conditions¹⁸¹.

Groundwater use

The only groundwater use at the site identified during the assessment was from the small amount (<10 m³/d) used by the Bantamsklip homestead, which is piped from a nearby spring¹⁸¹.

Groundwater interaction with wetlands

The Hagelkraal River supplies water to the wetlands, which in turn lose water to the Bredasdorp Aquifer’s deeper groundwater table. Chemical and isotopic data show minimal differences between wetland and groundwater, confirming their interaction. Similar water level responses to seasonal changes and rainfall further support this link.

No wetlands were found within the EIA Corridor area. Natural wetlands in the wider study area may be sensitive to disturbance, drainage, infilling, or hydrological changes—whether from surface or groundwater flow alterations—as well as nutrient enrichment (Day, 2005 as cited by SRK, 2026). They are also vulnerable to invasion by alien plants. Maintaining hydrological connectivity and riverine/wetland corridors from source to sea is essential¹⁸¹.

Groundwater potential

Groundwater potential at the site is low and geohydrological considerations should not be an issue in the siting of a NPP. Only small quantities of groundwater should be expected on site should groundwater be abstracted here.

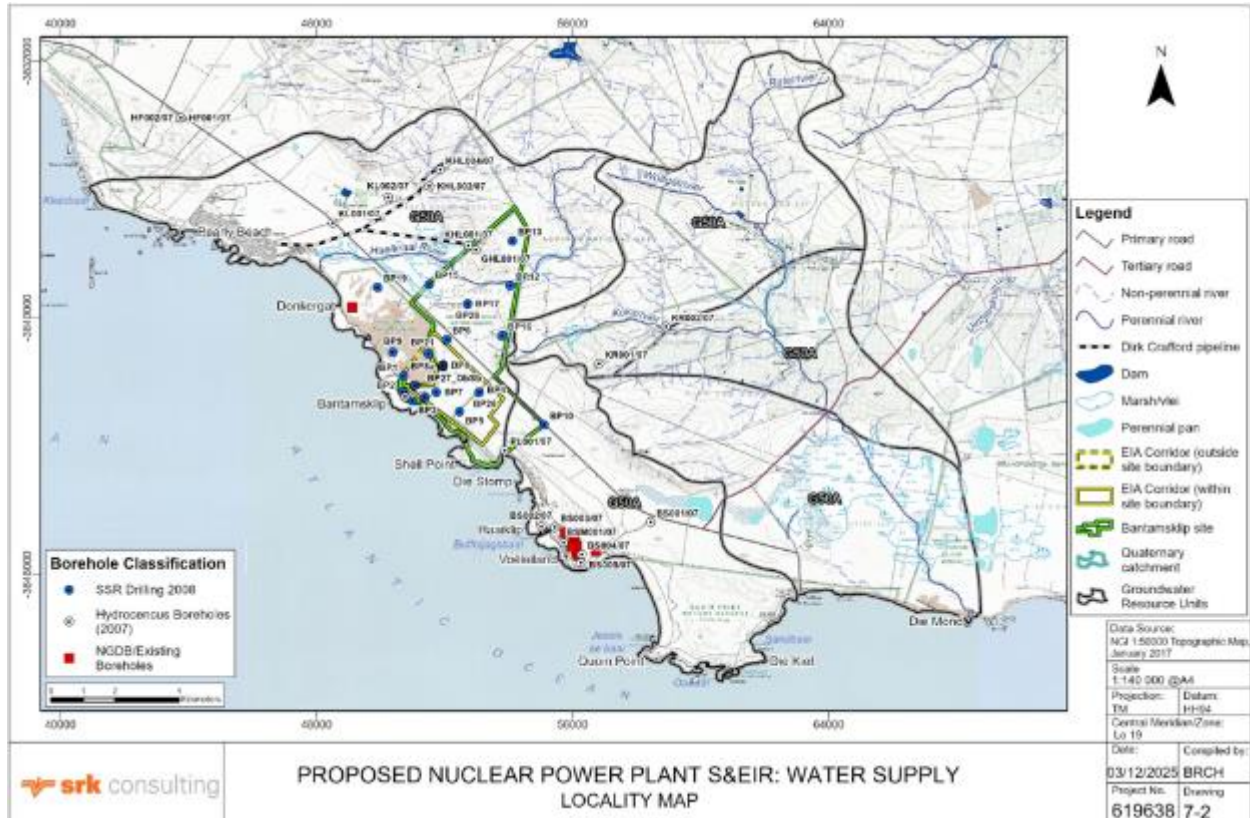


Figure 8-23 - Bantamsklip Borehole Locality Map. SRK, 2026

8.1.7.2 Thyspunt

The site and its catchments are mainly underlain by rocks of the TMG and Bokkeveld Group, with younger sediments from the Algoa Group. Specifically, the area sits on quartzitic sandstone, siltstone, and shale of the Skurweberg and Goudini formations (Nardouw Subgroup, TMG), featuring coastal outcrops of hard grey sandstone with interbedded black siltstone. Erosion has produced a wave-cut platform¹⁸¹.

Aquifers

The Algoa Group, the study area's primary aquifer, is an unconfined intergranular system where groundwater flows through pore spaces between grains. Due to rapid groundwater movement, coastal proximity, and the fractured rock's low permeability, there is little interaction between this and the fractured rock aquifer in Thyspunt.

The secondary aquifer at the site comprises quartzitic sandstones of the TMG Aquifer.

A detailed geohydrological study that informed the 2016 EIA found the Algoa intergranular aquifer to be economically viable, making it suitable as a water source for construction and potentially for domestic use at the proposed nuclear station¹⁷⁴.

Groundwater flow

Thirty-eight (38) groundwater exploration boreholes have been drilled at the site (Figure 8-24). An additional six boreholes were subsequently drilled to explore the Algoa Aquifer around Langefonteinvelei. Of these 44 boreholes, 20 were equipped as long-term monitoring stations.

Boreholes in the Algoa Aquifer showed high yields (5–10 l/s) in well-developed basal cobble layers, while those in fine sand produced lower yields (0.1–0.8 l/s). Aeolian sands and cobble layers had moderate to high yields (2–5 l/s).

The TMG formations also demonstrated moderate to high yields, with the Nardouw Aquifer's water-bearing fractures found 20–110 m deep and yielding 2–<5 l/s¹⁸¹.

For the purposes of the evaluation of the site and the preparation of this report, aquifer recharge refers to the amount of rainwater that infiltrates into the vadose zone (i.e. the unsaturated zone above the water table where interstices contain a combination of air and water) and then actually passes into the underlying aquifer, i.e. effective recharge. The effective recharge in the study area is estimated to average 23.8 Mm³/a¹⁸¹.

Data obtained from the groundwater investigation indicates that the flow direction in the primary and secondary aquifers was in a south-easterly direction and generally follows the topographic gradient¹⁸¹.

Groundwater Quality

The ground water quality measured from the primary Algoa aquifer was considered to be “relatively good quality” where the TGA was considered to be of “moderate” quality¹⁸¹.

No current contamination exists within the EIA Corridor.

The groundwater quality remained consistent with previous geohydrology findings. Based on site work carried out during the SSR update, there appears to be no existing groundwater contamination at the site. The site is located in a pristine area, as there are no existing contamination threats.

Groundwater contamination potential

Potential contaminants may migrate through the Algoa Aquifer (upper intergranular) and TMG Aquifer (lower fractured rock), with contamination likely limited to the EIA Corridor Area and coastal springs or seeps. Radioactivity leaks affecting groundwater users are unlikely, but site air emissions could travel inland on prevailing winds and contaminate groundwater via rainfall recharge¹⁸¹.

Groundwater use

From the results of the hydrocensus surveys it is evident that groundwater is used extensively for both agricultural (irrigation and stock watering) as well as domestic purposes within 5 km of the proposed site. Oyster Bay village relies solely on groundwater (spring and borehole) for domestic purposes. The spring feeding the town reservoir is located to the east of the village and arises in the dune field to the north-east, feeds a wetland and is pumped to the main storage reservoir in the town¹⁸¹.

Several springs presently provide water to the holiday residences near the site Thyspunt site, although most of these properties have now been vacated. The most significant flowing spring is situated at Langfontein, northeast of the Eskom property, discharging approximately 2 liters per second from beneath the northern sand dunes and traversing westward, eventually forming a stream at White Point. This resource is used for domestic purposes and is dammed by residents of three houses located at Buffelsbosch 742. Additionally, the most prominent coastal spring is found just west of Thyspunt (THY SP4), where it has been dammed and equipped with a pump to supply water to the fisherman's cabins on site¹⁸¹.

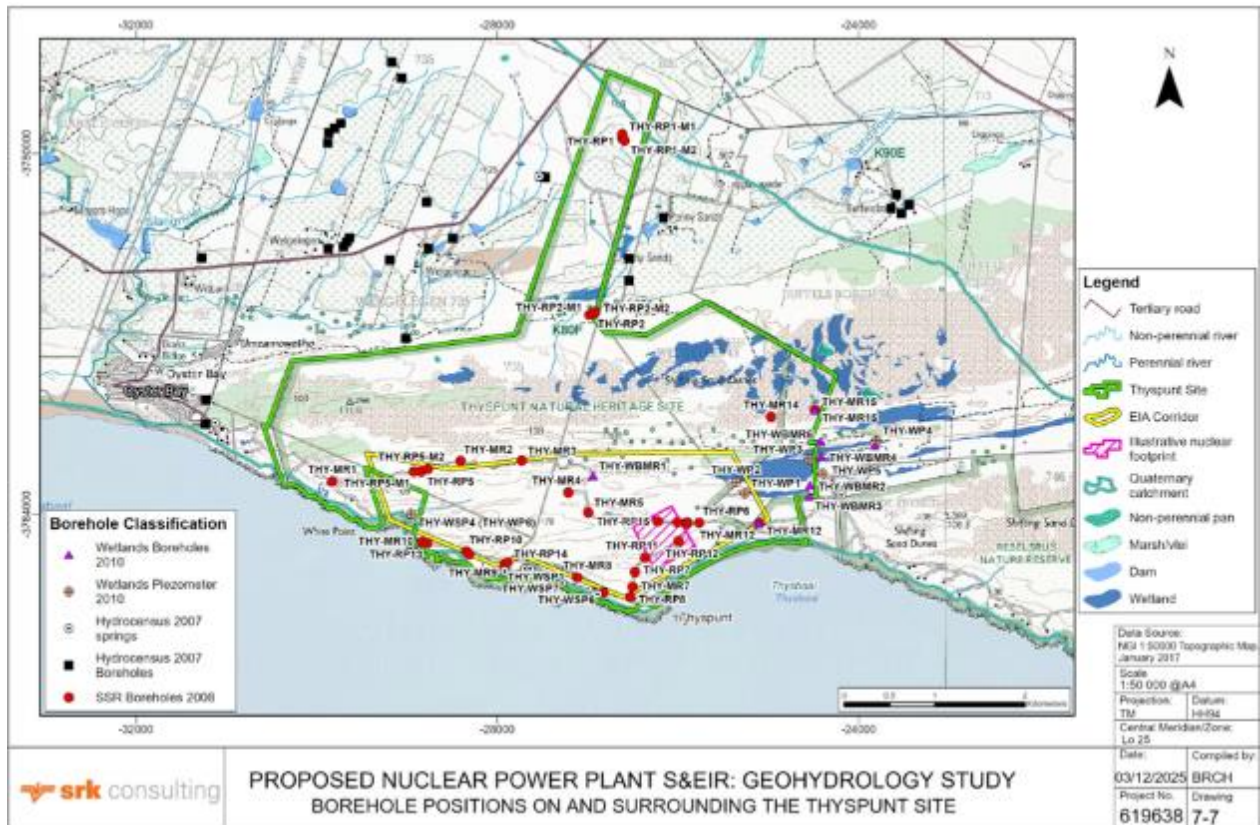


Figure 8-24 – Boreholes associated with the Thyspunt site. SRK, 2026

8.1.8 MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE

The baseline environment at Thyspunt and Bantamsklip sites and is summarised in this section, based mainly on the Site Safety Reports (SSRs) for each site (ESKOM, 2013, ESKOM, 2025), the Oceanography Report (Giljam, 2020) and the Marine Physical, Water Quality, Sediment Transport and Shoreline Change Scoping Report (WSP, 2026).

8.1.8.1 Bantamsklip

Site Setting and Coastal/Shoreline Forms

Bantamsklip is situated on the southern Cape coast approximately 10 km southeast of Pearly Beach. Bantamsklip lies on a mixed rocky-sandy shoreline, with rocky headlands at the northwestern and southeastern ends enclosing a central sandy pocket beach interspersed with smaller rock outcrops. This mixed morphology drives highly variable nearshore slopes and wave transformation patterns across this section of coastline.

At Bantamsklip, a shallow triangular reef is present around -10 m MSL offshore of the site and the seabed is mainly sandstone with partly lithified sediment. Cross-shore gradients vary from ~1:10 to 1:38 in the backshore (+2 to +12 m MSL), about 1:40 to 1:67 in the breaker zone (-5 to +2 m MSL), and roughly 1:28 to 1:124 in the outer nearshore (-30 to -5 m MSL). Reefs and outcrops at Bantamsklip strongly control where waves break, the magnitude of run-up, and local sediment mobility. Figure 8-25 shows the Bantamsklip site and shoreline context.



Figure 8-25 – Bantamsklip coastal context

Bathymetry and Sediment Characteristics

At Bantamsklip, multibeam surveys, repeated profiles and LiDAR similarly define nearshore morphology, including the prominent –10 m reef. Figure 8-26 summarises the bathymetric information at Bantamsklip.

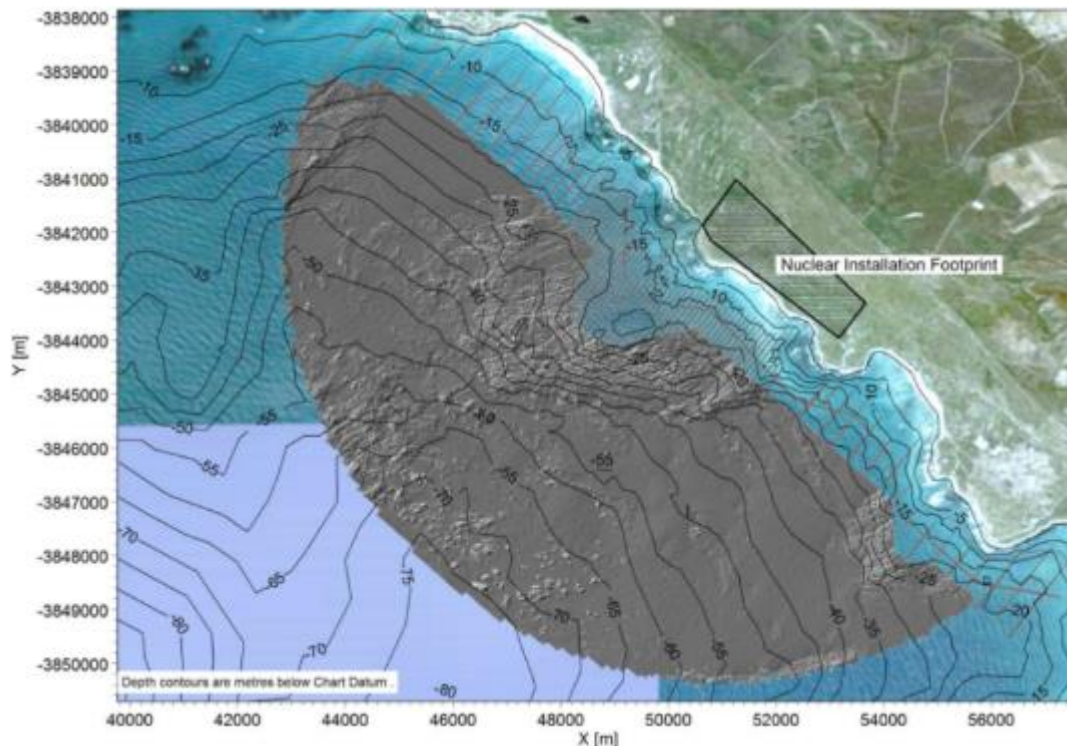


Figure 8-26 – Bantamsklip Bathymetry (Legend: Lighter grey lines normal to the coastline indicate beach profile sections)

Metocean Conditions

Data and Monitoring

Figure 8-27 shows the locations of oceanographic measuring instruments deployed at Bantamsklip. These instruments support the metocean characterisation alongside a broader marine monitoring programme from 2008 to 2012 (detailing bathymetry, shoreline profiles, sediment grain size, waves, water levels, currents, temperature, salinity, turbidity and biofouling).

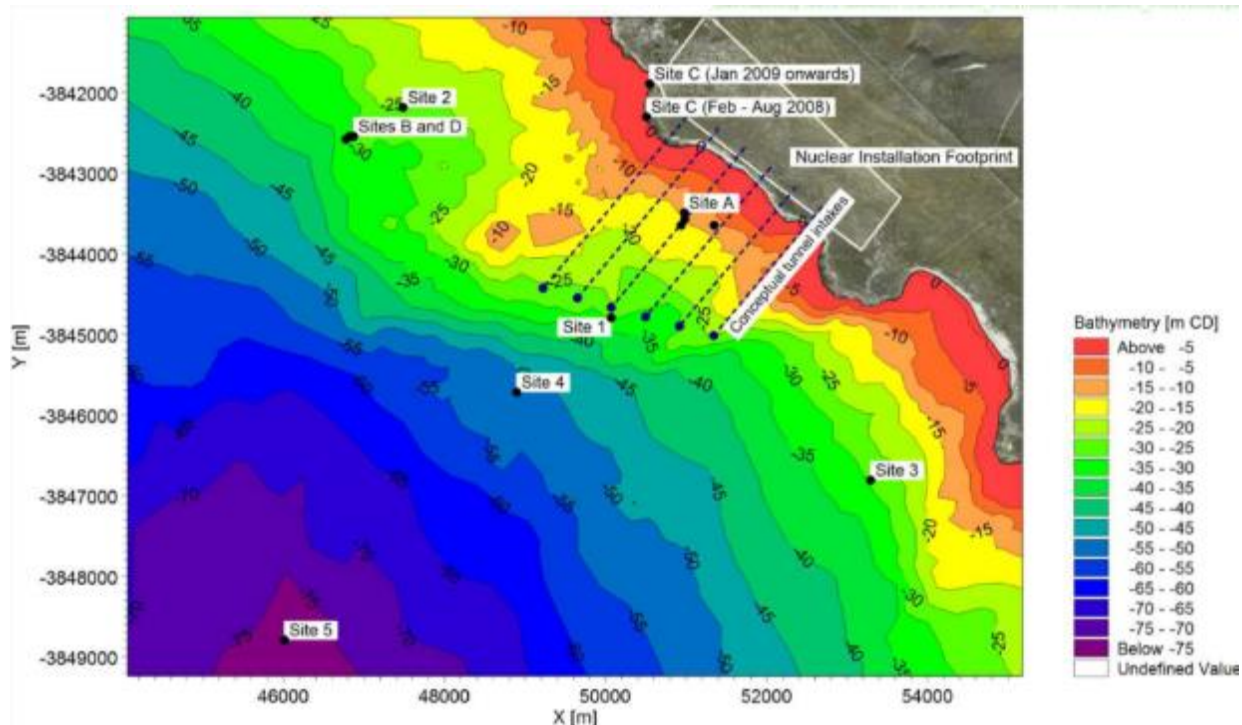


Figure 8-27 – Location of Instruments Deployed at Bantamsklip

Tides

Table 8-1 outlines the tidal levels at Bantamsklip.

Table 8-1 – Tidal Levels (Bantamsklip)

Parameter	Bantamsklip (Hermanus proxy)
Highest Astronomical Tide (HAT)	+1.28 m
Lowest Astronomical Tide (LAT)	-0.79 m
90th percentile high tide	+1.20 m
10th percentile low tide	-0.78 m
Tidal regime	Semidiurnal, microtidal

Storm Surge

Projections for storm surge were assessed using the results of a study by Vousdoukas et al. (2018) who used global hydrodynamic and wave models (based on six global climate models) in a probabilistic assessment of the impacts of climate change on extreme sea water levels.

Extreme storm surge at Bantamsklip was estimated is based on 30.2 years of Mossel Bay residuals, as well as through a deterministic hydrodynamic storm surge model (based on 18 y of wind and

atmospheric pressure data at Hermanus) (Table 8-2). Only small increases in storm surge due to climate change, at Bantamsklip, are expected, in the range of 0.10 m to 0.23 m for 1:100-year storm surge events.

Table 8-2 – Extreme water level increases due to storm surge

Exceedance probability	Bantamsklip (95% confidence interval storm surge) (m)
Year	Excluding Climate Change
1:1 year	0.62
1:10 years	0.82
1:100 years	1.02

Long Waves and Meteo-Tsunamis

Since the positive long wave amplitudes are significantly lower than those for Bantamsklip, Port Nolloth long-wave residuals are conservatively adopted on the basis that initiation mechanisms are not strongly location specific.

The water level increases due to long waves include the long wave component of meteo-tsunamis (generated by atmospheric pressure fluctuations). The long wave component of meteo-tsunamis is not analysed independently, as water level increases from volcanic flank collapse (slump-generated) tsunamis are almost 10 m greater than water level increases due to long waves or meteo-tsunamis, and it is therefore assumed that volcanic flank collapse tsunamis will govern the design. Verification of this is, however, required following a site-specific tsunami hazard analysis (THA). Water level increases due to long waves are expected at Bantamsklip.

Table 8-3 – Extreme water level increases due to long waves

Exceedance probability	Bantamsklip (95% confidence interval) (m)
Year	Excluding Climate Change
1:1 year	0.35
1:10 years	0.64
1:100 years	1.02

Currents

At Bantamsklip, mean current speeds are around 0.12 m/s near the surface at both ADCP sites and about 0.04 to 0.06 m/s near the seabed, with maximum measured speeds up to 0.73 m/s near-surface at Site A, 0.66 m/s near-surface at Site B and about 0.60 m/s near the seabed at Site A. Harmonic analysis indicates tidal currents are small, with the regime dominated by wind and wave forcing. The current data from the two deployed ADCPs is available from March 2008 to January 2012. Due to the short period of data available detailing the currents, an EVA of current speeds has yet to be conducted for Bantamsklip.

Seawater Temperature and Stratification

At Bantamsklip (data availability 2008–2012 at Sites A to D), near-surface waters (1.6 m) have a mean around 15.7°C with a maximum of 23.9°C and a minimum of 10.7°C, while at 30 m depth the mean is about 12.9°C with a maximum of 21.1°C and a minimum of 9.4°C. Seasonal stratification between 1.6 m and 30 m averages roughly 4.8°C in summer and 0.1°C in winter, with instantaneous differences ranging from about –1.8°C to +12.8°C.

The long Hermanus surf-zone dataset as a proxy for evaluating extremes (excluding climate change), the SSR estimates best-estimate and 95% confidence interval temperatures are presented in Table 8-4. Ongoing data from South African Weather Service with the longest available dataset being 25.1 years, at Hermanus, were also analysed to strengthen the EVA.

Table 8-4 – Extreme temperatures at Bantamsklip

Exceedance probability	Bantamsklip (°C)
Best Estimate	
Year	Excluding Climate Change
1:1 year	21.0
1:10 years	23.1
1:100 years	25.2
95% Confidence Interval	
Year	Excluding Climate Change
1:1 year	21.2
1:10 years	23.6
1:100 years	26.0

Salinity

At Bantamsklip, instruments are located at -10 m and -30 m water depths and salinity at approximately -30 m MSL averages 35.0 psu with less than 1 psu variability. Salinity is therefore a minor design parameter relative to temperature, which is an important determinant of the efficiency of the seawater cooling system.

Waves

Bantamsklip hourly wave measurements are available from the two deployed ADCPs. However, at the time of writing of the SSR, only 1.3 years of data are available at Site A within the 2008 to 2010 period, and 2.3 years of data within the 2008 to 2012 period available at Site B. These data indicate a harsh wave climate, with H_{m0} exceeding 1.9 m at Site B for 50 per cent of the year. The waves are smallest in summer and highest in winter and spring. A larger H_{m0} of 8.6 m was measured at Site B during a storm in 2008, however this value is unreliable as the instrument failed during this storm. The dominant wave approach is 220° at Site A and 210° at Site B, shifting slightly westward in winter and southward in summer (Figure 8-28).

15 years of offshore wave hindcast data from a global model named WAM (WAVE Model), which is verified against satellite data, was used to model nearshore wave data at -31 m MSL. This nearshore data was used for an EVA. The EVA results are presented in Table 8-5.

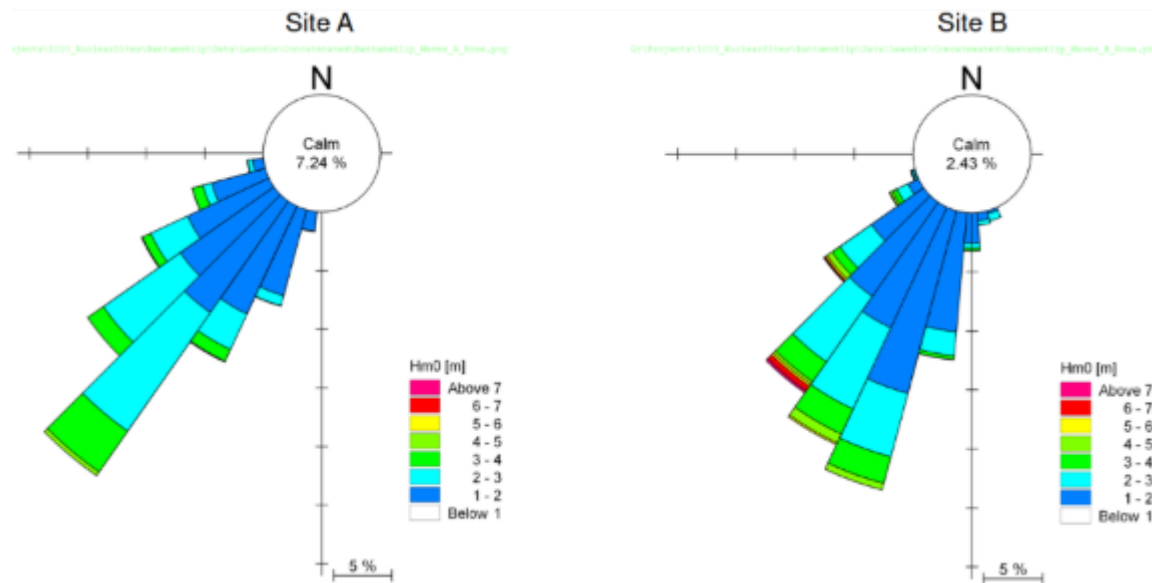


Figure 8-28 – Wave measurements at Bantamsklip Site A and B (PRDW, 2009b)

Table 8-5 – EVA Results Bantamsklip

Exceedance probability	H _{m0}		T _p	
	2012	2100	2012	2100
Best Estimate				
1:1-year	5.8	6.7	15.4	16.6
1:10-year	7.1	8.3	17.0	18.4
1:100-year	8.3	9.7	18.5	20.0
95% exceedance probability				
1:1-year	5.9	7.0	15.6	16.9
1:10-year	7.4	8.7	17.4	18.8
1:100-year	8.9	10.4	19.1	20.6

Sediment Characteristics

Bantamsklip shows more variable sands than Thyspunt. Sediment samples were collected at Bantamsklip on March 2008 from the beach near the high and low water marks and from the nearshore (10–30 m depth). Of the 20 nearshore stations surveyed, 13 were located on rocky reef, resulting in only seven stations yielding sand samples. Beach sand at Pearly Beach is uniform, with an average grain size (D₅₀) of 0.20 mm and an average grading of 1.3. In contrast, the beach fronting the Nuclear Plant Corridor is more variable, with D₅₀ ranging from 0.14 to 0.61 mm and grading from 1.3 to 1.5. The seven nearshore sand samples exhibit D₅₀ values between 0.14 and 0.61 mm and grading from 1.2 to 1.6. Overall, the nearshore survey indicates extensive rocky reef offshore of the site, with sandy substrates limited to localized patches.

Suspended Sediment and Turbidity (Water Quality)

Considering Bantamsklip, at the time of writing of the SSR, 164 water samples had been collected at the site and analysed for Total Suspended Solids (TSS), which also showed presence of both organic (e.g. algae) and inorganic (e.g. silt) particles suspended in the water column. At Site A, the

average TSS measured is 4.3 mg/L and the maximum is 31 mg/L. At the deeper Site B (total water depth = -30 m MSL) the values are lower, with an average TSS of 2.7 mg/L and a maximum of 10 mg/L. modelled concentrations of suspended sand at deeper tunnel intake depths are typically below 30 mg/L at 1 m above the seabed, which is materially lower than for shallow basin concepts and helps to limit sand ingress and maintenance burden.

Shoreline Stability and Erosion

At Bantamsklip storm erosion modelled with SBEACH shows that sandy profiles (e.g., Profiles 3 and 4 at Pearly Beach) experience foredune erosion during 1:100-year storms, causing flooding of low-lying surrounding areas (Figure 8-29 and Figure 8-30).

Figure 8-30 show the locations of measured beach profiles, and associated storm erosion (excluding climate change impacts). To account for the effects of sea-level rise, 1.2 m SLR by 2100 is applied with a Bruun-rule estimate of horizontal shoreline recession for sandy profiles. This results in horizontal shoreline recession of 36 to 58 m at Profiles 4, 3 and 6.

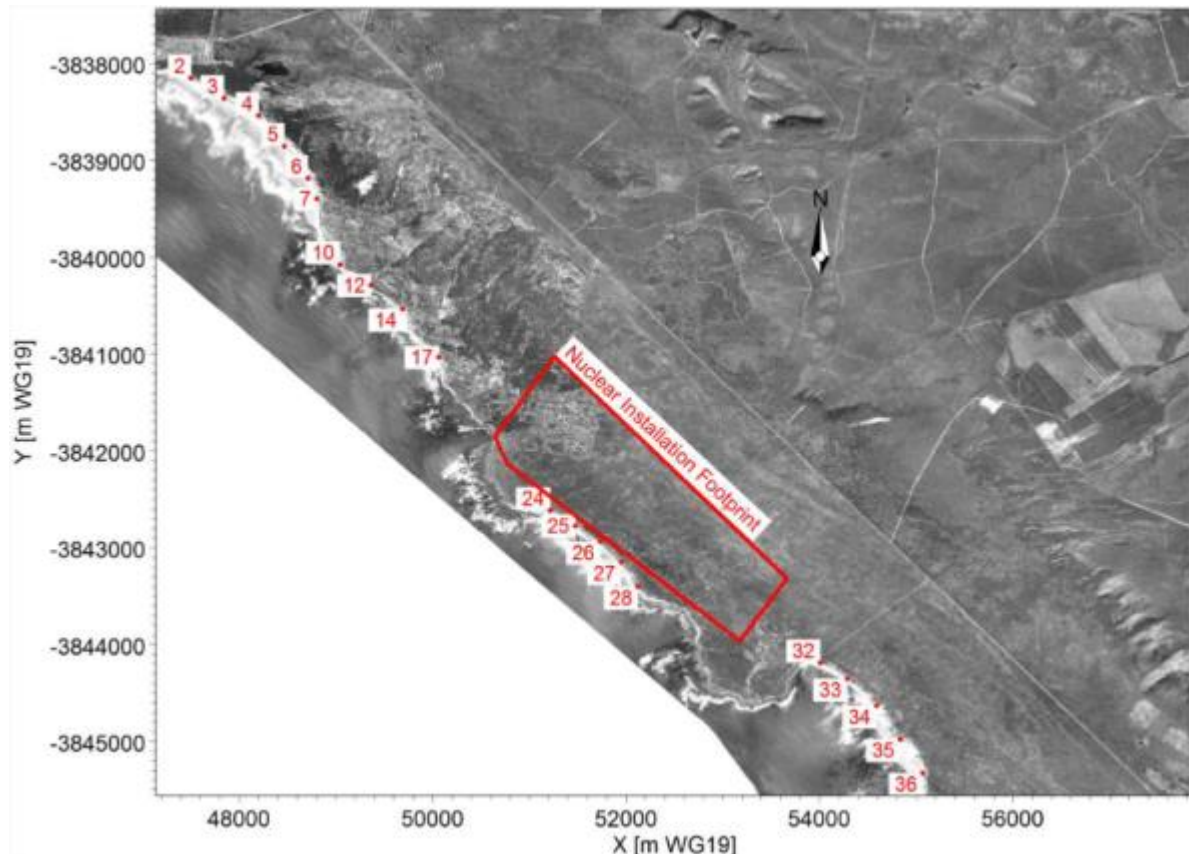


Figure 8-29 – Measured beach profile locations at Bantamsklip

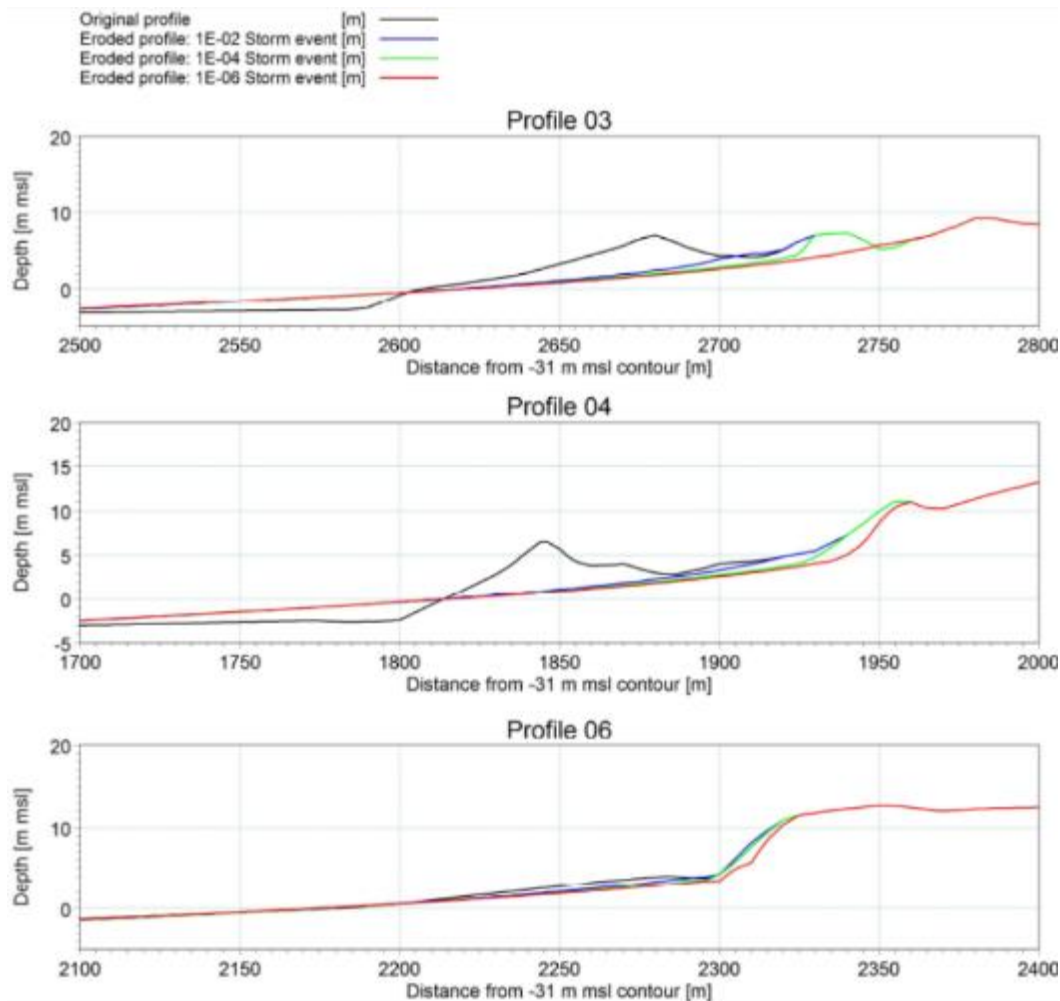


Figure 8-30 – Modelled storm erosion profiles at Bantamsklip

Seasonal shoreline variability is insignificant compared to storm erosion, with a maximum seasonal erosion at the 0 m msl contour of about 17 m and generally limited to below 4 m MSL. Long-term analysis of aerial photographs (1981 to 2007) shows localised erosion and accretion without a strong unidirectional trend, and oscillated within an envelope, but remaining fairly stable over the long term.

8.1.8.2 Thyspunt

Site Setting and Coastal/Shoreline Forms

Thyspunt lies on an exposed stretch of the south coast that faces prevailing south-southwesterly deep-sea swell. The shoreline comprises a predominantly rocky coast to the west and the sandy Thysbaai to the east, separated by a rocky headland.

At Thyspunt, vegetated dunes back the rocky western coastline, typically rising above roughly +4 m MSL. Along Thysbaai there is a shore-parallel vegetated dune and, at the eastern end of the bay, an east–west dune ridge whose crest exceeds approximately +25 m MSL. The inshore seabed west of the headland is predominantly rocky with intermittent sediment, whereas Thysbaai is largely sandy with intermittent reef becoming more prominent offshore. A broad band of rock with intermittent sediment extends south from the headland and trends southeasterly offshore

of Thysbaai as a submerged rocky point. Representative seabed slopes vary; in Thysbaai the average slope is about 1:30 and has been used in coastline stability analyses. Figure 8-31 shows the Thyspunt site and shoreline context.



Figure 8-31 – Thyspunt coastal context

Bantamsklip is situated on the southern Cape coast approximately 10 km southeast of Pearly Beach. Bantamsklip lies on a mixed rocky-sandy shoreline, with rocky headlands at the northwestern and southeastern ends enclosing a central sandy pocket beach interspersed with smaller rock outcrops. This mixed morphology drives highly variable nearshore slopes and wave transformation patterns across this section of coastline.

Bathymetry and Sediment Characteristics

Bathymetric and topographic data for Thyspunt were compiled from multibeam surveys, beach profiles, LiDAR and supporting geoscientific information, allowing sediment thickness and bedrock levels to be resolved for coastal stability modelling. Figure 8-32 summarises the bathymetric information at Thyspunt.

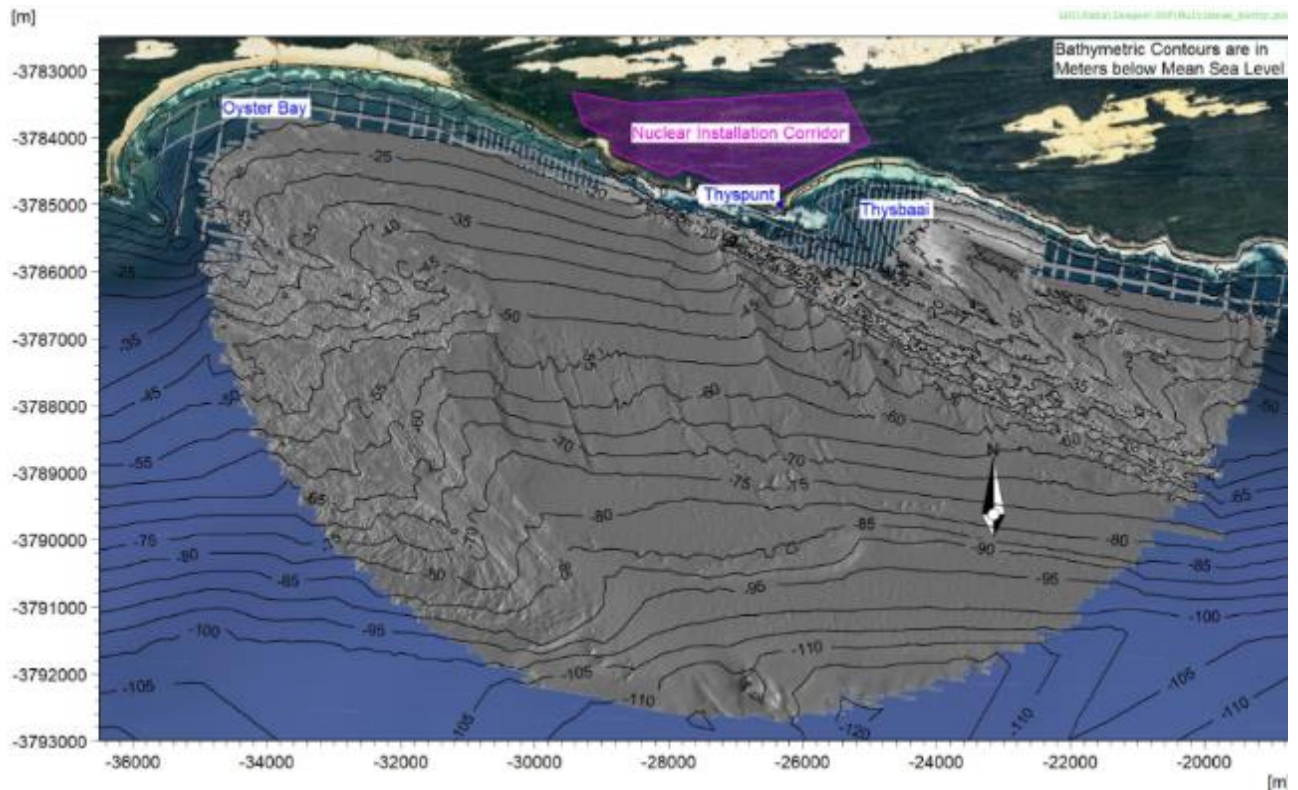


Figure 8-32 – Thyspunt multibeam bathymetry and beach profile sections (Legend: Light grey lines indicate beach profile sections)

Metoccean Conditions

Data and Monitoring

Figure 8-33 shows the locations of oceanographic measuring instruments deployed at Thyspunt. Measurements include waves, currents, water levels, temperature, salinity, biofouling, beach profiles, sediment grain sizes and TSS, derived from instruments such as an ADCP (Acoustic Doppler Current Profiler). Additionally, a weather station measuring wind speed, direction and atmospheric pressure (for water level correction), is deployed at +52.2 m MSL.

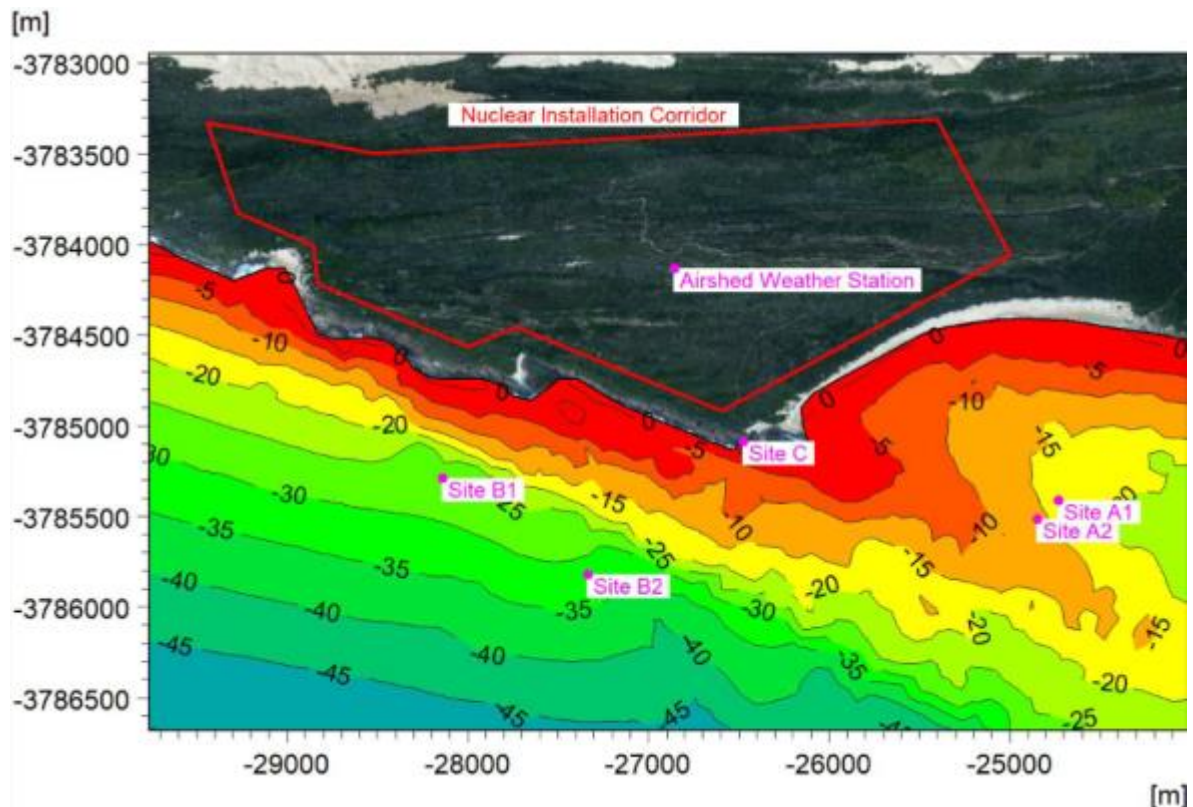


Figure 8-33 – Location of Instruments Deployed at Thyspunt (Eskom, 2025)

Tides

Table 8-6 outlines the tidal levels at Thyspunt.

Table 8-6 – Tidal Levels (Thyspunt)

Parameter	Thyspunt (MSL, mid-2013 baseline)
Highest Astronomical Tide (HAT)	+1.406 m
Lowest Astronomical Tide (LAT)	-0.873 m
90th percentile high tide	+1.08 m
10th percentile low tide	-0.65 m
Tidal regime	Semidiurnal, microtidal

Storm Surge

Projections for storm surge were assessed using the results of a study by Vousdoukas et al. (2018) who used global hydrodynamic and wave models (based on six global climate models) in a probabilistic assessment of the impacts of climate change on extreme sea water levels (Table 8-7).

Table 8-7 – Extreme water level increases due to storm surge

Exceedance probability	Thyspunt (95% confidence interval storm surge) (m)		
Year	2034	2114	2134
1:1 year	0.60	0.62	0.62
1:10 years	0.82	0.84	0.85
1:100 years	1.02	1.04	1.05

Long Waves and Meteo-Tsunamis

Long-period water level oscillations in the 8-to-60-minute band are recognised at Thyspunt (**Table 8-8**). For Thyspunt, a combined high-frequency tide gauge dataset provides an effective record of around 41.2 years for extreme analysis. The current SSR notes these long-wave extremes are expected to be enveloped by tsunami hazards when the updated THA is completed. Since the positive long wave amplitudes are significantly lower than those.

The water level increases due to long waves include the long wave component of meteo-tsunamis (generated by atmospheric pressure fluctuations). The long wave component of meteo-tsunamis is not analysed independently, as water level increases from volcanic flank collapse (slump-generated) tsunamis are almost 10 m greater than water level increases due to long waves or meteo-tsunamis, and it is therefore assumed that volcanic flank collapse tsunamis will govern the design. Verification of this is, however, required following a site-specific THA.

Table 8-8 – Extreme water level increases due to long waves

Exceedance probability	Thyspunt (95% confidence interval) (m)		
Year	2034	2114	2134
1:1 year	0.33	0.34	0.34
1:10 years	0.58	0.59	0.60
1:100 years	0.94	0.96	0.97

Currents

Measured currents at Thyspunt are typically moderate with speeds below 1 m/s, though maxima near 1.01 m/s have been recorded at Site B near both surface and seabed and up to 0.66 m/s near the surface at Site A. Currents are influenced by wind and wave forcing as well as Agulhas Current processes, including Ekman rotation and episodic upwelling under easterly winds. Projected changes in the Agulhas Current offshore of Thyspunt are therefore not conclusive. An extreme value analysis (EVA) was performed on the 10-minute depth-averaged current speeds measured at Site B, which has the longest dataset, of 5.26 years of data available (Table 8-9). Due to the limited length of dataset, the EVA has a high degree of uncertainty associated.

Table 8-9 – EVA of depth-averaged current speeds at Thyspunt

Exceedance probability	Thyspunt (m)		
Year	2034	2114	2134
1:1 year	0.83	0.85	0.85
1:10 years	0.98	1.00	1.01
1:100 years	1.14	1.17	1.18
1:1000 years	1.32	1.35	1.36
Year	2034	2114	2134
1:1 year	0.84	0.86	0.86
1:10 years	1.16	1.18	1.19
1:100 years	1.59	1.63	1.64
1:1000 years	2.08	2.13	2.14

Seawater Temperature and Stratification

At Thyspunt, measured hourly temperatures (Sites A, B and C) show clear seasonality: temperature variability is much greater in summer than in winter with summer variability (resulting in higher temperatures) driven by solar heating and upwelling (resulting in lower temperatures) events. At -30.8 m MSL (Site B), minimum measured temperature is approximately 7.93°C and maximum measured temperature about 22.73°C. Thermal stratification is strongest in summer; the difference between the shallow Site C and Site B reaches a 95th percentile of roughly 11.68°C in summer (Table 8-9).

To assess intake-relevant extremes, the dataset was augmented with a Middelbank thermistor string to strengthen the extreme value analysis at intake depth. The resulting best-estimate and 95% confidence interval maximum intake temperature extremes at -30.8 m MSL are presented in Table 8-10. Minimum extremes remain well above 0°C, so ice formation is not expected. Only 6.79 years of valid data are available at Thyspunt (Site B), which was supplemented with 14 years of thermistor string data from July 1997 to November 2011 at Middelbank, approximately 75 km west of the Thyspunt nuclear site.

Table 8-10 – Extreme temperatures at Thyspunt

Exceedance probability	Thyspunt (°C)		
Best Estimate			
Year	2034	2114	2134
1:1 year	22.47	25.31	26.32
1:10 years	23.21	26.05	27.06
1:100 years	23.68	26.52	27.53
95% Confidence Interval			
Year	2034	2114	2134
1:1 year	22.62	25.45	26.46
1:10 years	23.34	26.18	27.19
1:100 years	23.85	26.68	27.69

Salinity

At Thyspunt instruments are located at -10 m and -30 m water depths and salinity at approximately -30 m MSL averages 35.0 psu with less than 1 psu variability. Salinity is therefore a minor design parameter relative to temperature, which is an important determinant of the efficiency of the seawater cooling system.

Waves

5.5 years of available ADCP wave data at Thyspunt indicate a rough wave climate. To supplement the limited wave data, nearshore wave data were modelled based on 45.5 years of offshore wave hindcast data from a global model. The resultant nearshore conditions are summarised in the wave roses below (Figure 4-7). At Site B (-30.8 MSL) the median significant wave height (H_{m0}) is 1.91 m. The largest waves measured to date are an H_{m0} of 4.9 m at Site A and 7.5 m at Site B. There is clear seasonality, with smaller waves in summer and larger in winter, although the maximum recorded event occurred in summer.

fragments occur. Overall, the site comprises a sandy beach transitioning to finer nearshore sediments, punctuated by localized reef outcrops bearing coarse bioclastic material.

Suspended Sediment and Turbidity (Water Quality)

At Thyspunt, 66 water samples show TSS with a median near 3 mg/L, an average around 5 mg/L and a maximum of about 40 mg/L. The samples showed presence of both organic (e.g., algae) and inorganic (e.g., silt) particles suspended in the water column and in shallower sites relative to further-offshore sites. Profiles indicate relatively uniform concentrations through the water column, suggesting dominance of fine cohesive particles ($D_{50} < 0.063$ mm), as larger sand particles would settle more quickly towards the seabed. Suspended sand near the intakes is treated separately in the sediment transport analysis.

Shoreline Stability and Erosion

At Thyspunt, beach profile sections were measured at 20 locations from 2008 to 2012 coastline stability assessments indicate erosion increases over time due to SLR-driven recession, rotation in the wave climate and increases in storm wave height and surge. Erosion is more severe along the sandy coast of Thysbaai than along the rocky west coast. Based on a 2D sediment transport model, erosion due to storms is significant, but increases in longshore sediment transport or coastline rotation are not significant.

Figure 8-34 to Figure 8-36 show the erosion lines relevant to the 2034, 2114 and 2134 climate change scenarios, where the erosion lines denote erosion due to storm events of various 1:100-year to 1:1*108-year return periods. Note that the erosion lines show the most landward extent where erosion exceeding 0.05 m occurs, and the spatial extents of the nuclear installation corridor are mapped.

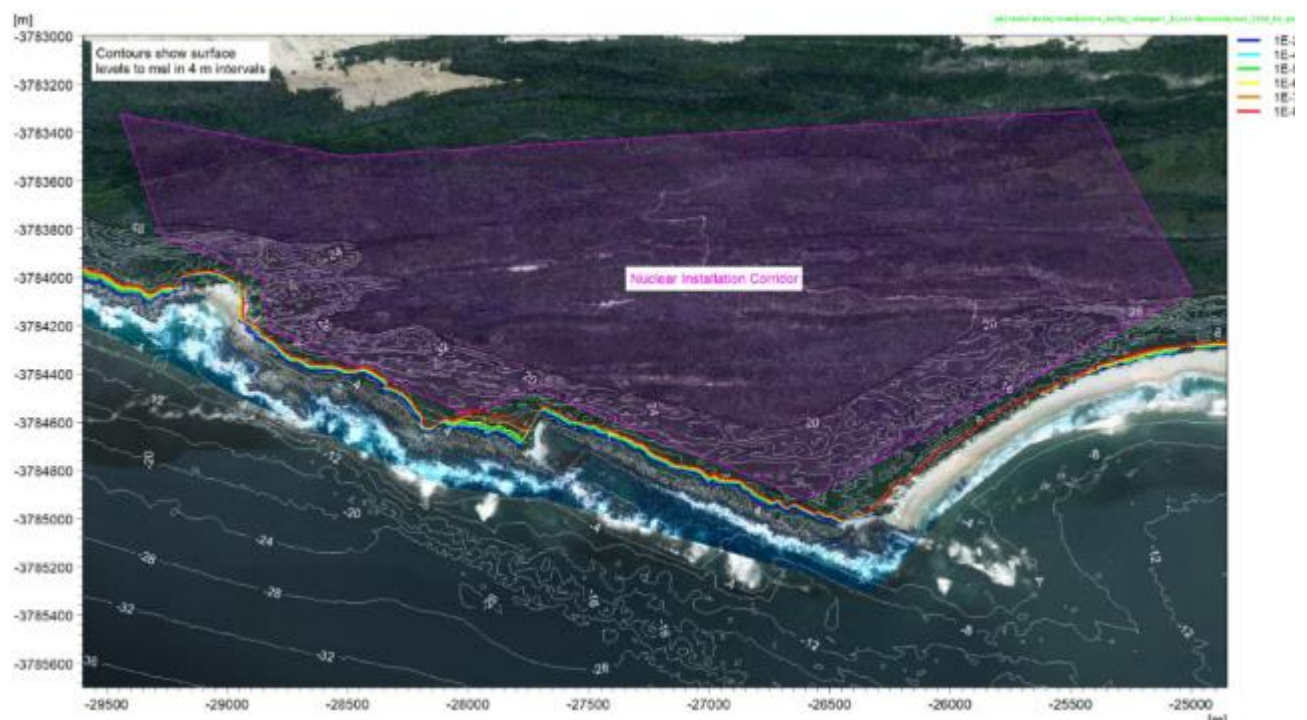


Figure 8-34 – Erosion lines for 2034 climate change scenario



Figure 8-35 – Erosion lines for the 2114 climate change scenario

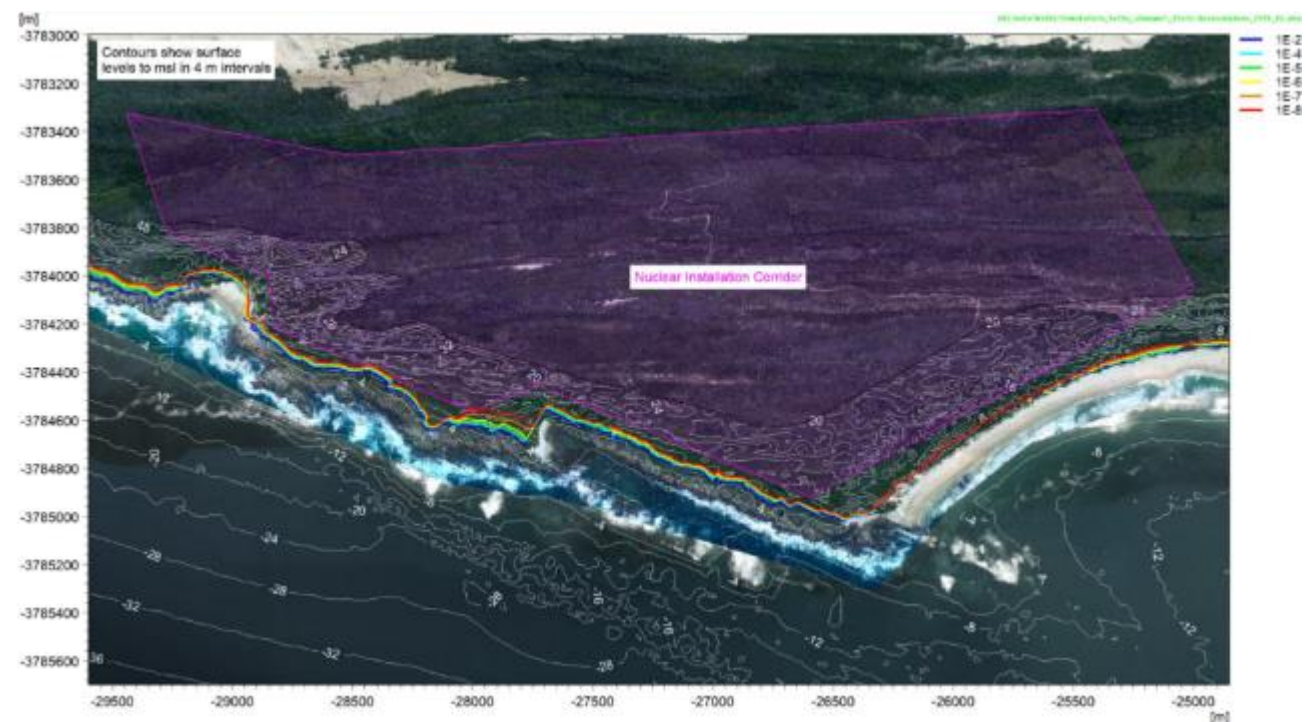


Figure 8-36 – Erosion lines for the 2134 climate change scenario

8.1.9 BACKGROUND RADIATION

This section is relevant to both the Thyspunt and Bantamsklip sites. This section provides a high-level summary of the 2026 Potential Radiological Impact Assessment on the public and environment report (Slabbert, 2026).

8.1.9.1 Nuclear power plant discharges and ionising radiation dose to members of the public

An assessment of operational radioactive discharges from a representative set of GEN III nuclear power plants was carried out by considering specific environmental characteristics of each site. The annual doses were calculated for three different age group recommended by the International Commission on Radiological Protection (ICRP). These age groups are representative of an infant, child and an adult. The highest dose was calculated for the adult age group when taking into account the different habits, for example consumption of food produced in the vicinity of a NPP and exposure times. National regulations specify an annual effective dose limit of 1,0 millisievert per year (mSv/y) for members of the public from all nuclear facilities in the country. To ensure that the limit is not exceeded, a dose constraint equal to 0,250 mSv/y is also specified for individual facilities such as a NPP. The dose limit and dose constraint are applied to the additional dose people may receive in excess to their natural background dose is discussed in Section 3 of the report.

The regulatory dose constraint of 0,250 mSv/y to a member of the public can be met at each of the two sites based on the results of a prospective dose assessment for each site. The results are summarised in Table 8-11.

Table 8-11 – Site annual dose to a member of the public (representative person dose)

Site	Age Group	Airborne Exposure Pathways; mSv/y	Liquid Exposure Pathways; mSv/y	Short-term Discharges following Minor Occurrences; mSv/y	External Radiation; mSv/y	Total Dose mSv/y
Thyspunt	Adult	0,027	0,138	0,006	0,001	0,171
Bantamsklip	Adult	0,010	0,116	0,002	0,001	0,129

8.1.9.2 Radiological risk to non-human biota

Risk assessments were performed using conservative atmospheric and marine radionuclide concentrations resulting from annual NPP discharges. The biota risk values were derived based on atmospheric concentrations in close proximity to a NPP and radionuclide concentrations in the local marine compartment into which the NPP discharge its cooling water. There are no regulatory dose limit and dose constraint values applicable to non-human biota.

An internationally agreed reference dose rate value is 10 µGy/h (approximately 0.25 mGy/d), a value well below any dose rate where measurable effects in the organisms would be detected. None of the reference organisms exceeds the screening value of 10 µGy/h at the two sites.

8.1.9.3 Background radiation at Bantamsklip and Thyspunt

Background radiation surveys were carried out at each of the sites. The results indicate that the radiation dose to people living at the coastal areas near the two sites is lower than global average

dose of 2,4 mSv/y which consist of the following main human exposure pathways to sources of natural origin outlined in Table 8-12 and Figure 8-37.

Table 8-12 – Natural radiation exposure pathways and human dose

Natural Source	Dose (mSv/year)	Contribution (%)	Notes
Radon inhalation	~1.2	~50%	Largest contributor; varies with geology and housing ventilation
Cosmic rays	~0.3	~13%	Higher at altitude and during air travel
Terrestrial radiation	~0.5	~21%	From naturally occurring radionuclides in soil and rocks
Ingestion (food and water)	~0.3	~13%	Mainly potassium-40 and other radionuclides in diet
Total natural radiation dose	2.4	1 to 13	There are regions in the world where sizeable population groups receive 10 to 20 mSv/y.

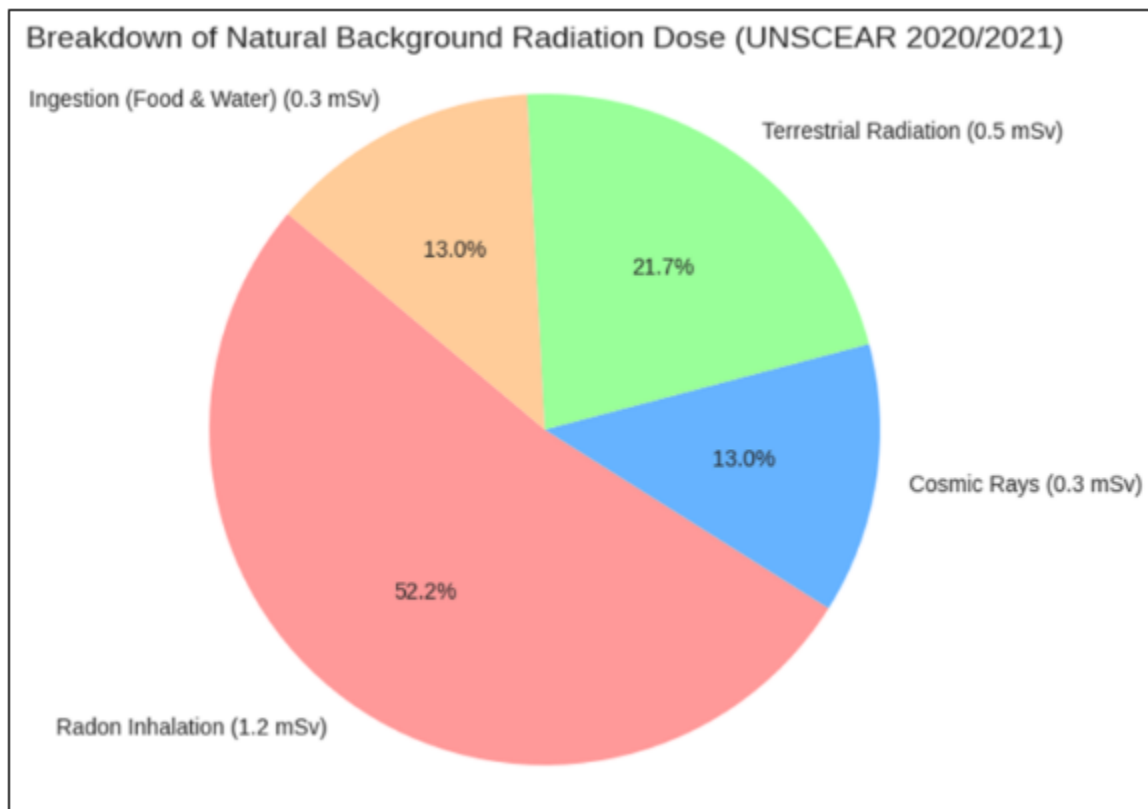


Figure 8-37 – Illustration of components of average human dose from different exposure pathways

People living near the sites receive a background radiation dose that is estimated to be less than 2 mSv/y.

One of the objectives of the background radiation surveys was to identify any radioactivity anomalies of natural origin that may exist in the regions where the sites are located. High terrestrial

radioactivity was detected at a location west of the Thyspunt site. The radioactivity results of marine biota confirmed international findings on the naturally occurring radionuclide polonium-210 and its potential high dose contribution to humans. Artificial radionuclides, for example Cs 137, were detected at both sites. Globally, the presence of Cs 137 is attributed to historic events such as atmospheric atomic weapons tests.

8.1.10 AIR QUALITY

Baseline information gathered from Airshed's 2026 Air Quality Impact Assessment – Scoping Phase has been used to inform this chapter.

Sensitive Receptors

Air quality sensitive receptors (AQSRs) primarily refers to places where people reside; however, they can refer to other sensitive environments that may adversely be affected by air pollutants. For both Bantamsklip and Thyspunt, not a lot has changed between the time the original Nuclear 1 assessment was carried out until now, in terms of sensitive recipients associated with the proposed sites.

8.1.10.1 Bantamsklip

Sensitive Receptors

The following farms illustrated in Figure 8-38 have been identified as sensitive receptors to the Bantamsklip site:

- Farm Hagelkraal 318 Portion 0 and 1
- Farm Buffel Jagt 309 Portion 2 and 3
- Farm Buffel Jagt 311 Portion 0
- Farm Luipaards Poort 310 Portion 0
- Farm 338, Portion 0

Land-Use

Conservation land use extends about 7 km north and northwest of Bantamsklip (Figure 8-38). The Hagelkraal River is 5 km north, and the Kok River is 8 km northeast of the site. The area has low population density—fewer than 500 people per km² (Census 2007 as cited in Airshed, 2026). Major towns nearby include Gansbaai (25 km NW), Hermanus (44 km NW), Struisbaai (47 km ENE), and Bredasdorp (60 km ENE). Pearly Beach (4.5 km NW) and Die Dam (10 km SE) are smaller communities closer to the site.

This region remains largely undeveloped, with agriculture concentrated near Pearly Beach and Gansbaai.



Figure 8-38 – Properties associated with the Bantamsklip site. WSP, 2026

8.1.10.2 Thyspunt

Sensitive Receptors

The following farms have been identified as sensitive receptors to the Thyspunt site (Figure 8-39):

- Farm 745 Portion 238
- Farm Langefontein 736 Portion 1-8 and 172
- Farm Welgelegen 735 Portion 2, 9, 10, 14, 16, 17 and 18
- Farm Welgelegen 743 Portion 0, 4, 6 and 8
- Farm 741 Portion 0
- Farm Buffelsbosch 742 Portion 0, 6, 9, 12, 14, 16, 17 and, 18, 19, 20, 21 and 22
- Farm 824, Portion 0
- Farm 825 Portion 0
- Farm 826, Portion 1
- Farm 809, Portion 0 and 36
- Farm 746, Portion 0, 5, 11, 14, 23, 24, 87 and 92



Figure 8-39 – Properties associated with the Thyspunt site

In the Thyspunt area, land usage within roughly 10 km of the site is mostly vacant. Starting about 2.5 km north, extensive cultivated fields dominate (Figure 8-39). The primary agricultural activities are producing fodder for dairy cows, sheep (mainly beyond 10 km northwest of the site), and cattle raised for meat. Limited game farming takes place northward, with wheat cultivation found to the west and north.

Major nearby residential areas include Humansdorp (about 18 km north-northeast), Jeffreys Bay (around 25 km northeast), St. Francis Links (approximately 10 km east), Sea Vista (roughly 12 km east), and Cape St. Francis (about 13 km east-southeast). Smaller developments closer to the proposed site comprise Oyster Bay (around 3 km west), Amaninzi (10 km northeast), and Klippepunt (10 km west). Most of the region's population density is under 500 people per square kilometre, though higher densities—ranging between 2,000 and 5,000 per km²—are observed in Humansdorp and Jeffreys Bay (according to the 2007 Census, Statistics South Africa as cited by Airshed, 2026).

AQ conditions

A limited three-month sampling campaign was conducted from March to May 2009 as part of the Nuclear 1 Assessment to help establish baseline air quality conditions. The results indicated monthly average concentrations of sulphur dioxide and nitrogen dioxide at 0.40 µg/m³ and 1.51 µg/m³, respectively. These values were deemed low and indicative of typical conditions in areas removed from significant sources of air pollution.

Oyster Bay, which was situated approximately 3 km from the site, represented the nearest potential source of air pollution. Emissions in this area generally consisted of fugitive dust arising from construction activities and unpaved roads, as well as combustion products from domestic fires and vehicle use. Owing to the sparse population, these emissions were not considered substantial.

Increased human activity at Cape St. Francis might have led to elevated air pollution levels; however, its location 13 km east of the site suggested minimal impact. Humansdorp, which was comparatively more industrialised, lay approximately 18 km north of the site. Nevertheless, prevailing easterly and westerly winds limited the likelihood of air pollution being transported to the proposed NPS site¹⁷⁴.

8.1.11 METEOROLOGY

8.1.11.1 Bantamsklip

Bantamsklip has moderate temperatures, mild seasonal variation, limited extreme heat, and winter-dominant rainfall typical of the Overberg coast. These baseline conditions frame the climate change impact assessment and related vulnerabilities discussed later in this report.

Wind

Wind flow recorded at the Bantamsklip WS, shows that mainly east and west, wind is experienced at this site. The sites rarely experience northerly winds. Daytime brings stronger south and south-south-easterly winds due to sea breezes, while nighttime is calmer with increased north and north-westerly offshore winds.

Between 2008 and 2011, east-northeasterly winds were most prevalent at the site, occurring roughly 18% of the time. This direction also saw the highest frequency of strong winds—1.14% of instances exceeded 12 m/s. The next highest frequency of strong winds originated from the east (0.34%), followed by the west (0.14%) and west-southwest (0.11%).

During January 2008 to December 2011, the strongest sector-averaged winds at the site came from the east-northeast (6.2 m/s) and west (6.1 m/s). The highest recorded hourly wind speed was 16.4 m/s from the east. Bantamsklip saw a maximum of 16.4 m/s with a west-northwesterly wind. Winds above 10 m/s, 12 m/s, 14 m/s, 16 m/s, and 18 m/s persisted for 39, 21, 14, 2, and 0 hours. No hourly average wind speeds exceeded 18 m/s during the study.

Seasonal wind roses show that the site experienced far more east-northeasterly and east-southeasterly winds than Hermanus, which received increased westerly winds during summer. The site also saw significantly greater frequencies of east-northeasterly, easterly, west-northwesterly, and westerly winds throughout autumn, comparatively. In winter, east-northeasterly winds were most common at the site, followed by west-northwesterly winds.

The site is located on flat terrain, but wind flow is influenced by the Koude Mountains to the north and Buffeljagsberg to the east. The Koude Mountains limit northerly winds, while Buffeljagsberg alters easterly winds to an east-northeasterly direction. In mountainous areas, weak prevailing winds allow valley flows: slopes heat up during the day causing upslope winds, and cool at night resulting in downslope winds, which can lead to temperature inversions trapping pollutants.

Air contaminant dispersion is complex in the northern and northeastern mountains, particularly during mild winds and nighttime inversions, with plumes following valley flows and remaining

undiluted over long distances. However, winds toward these sectors are infrequent, accounting for about 9%.

Temperature

The main observations from data collected from dry-bulb temperatures at Bantamsklip (2008-2011), and Hermanus (1998-1994) have been summarised as follows:

- The trends in the mean temperatures for Hermanus and the site are quite similar. However, the highest mean daily maximum temperature at Hermanus is in January (23.0°C), whereas the highest mean daily maximum temperature at the site is in March (24.8°C). These discrepancies are most likely only due to the short sampling sizes.
- The mean of the daily maximums for the site and Hermanus were the same, i.e. 20.9°C, respectively. The mean of the daily minimums for the site and Hermanus were slightly different, viz. 13.2°C and 13.9°C, respectively.
- The most extreme hourly average temperatures over the 1998 to 2011 period at Hermanus were recorded on 12 November 2005 (38.2°C) and 31 July 2002 (4.8°C). Slightly different extremes were observed at the site during the 2008 – 2011 period (36.2°C on 5 January 2010 and 2.8°C on 10 September 2009).

Precipitation

The site area is classified as a winter rainfall region, with MAP estimated to fall between 400.0 mm and 600.0 mm (Figure 8-40). Due to the absence of long-term rainfall records specific to the site, the South African Weather Service Weather Station (SAWS WS) at Stanford was chosen to represent long-term rainfall patterns in the area, given its dependable 55% reliability and proximity—approximately 30 km from the site.

Rainfall measurements at the site revealed a MAP of 507.8 mm over the 2008–2011 period, with a maximum annual total of 561.1 mm recorded in 2009 and a minimum of 369.2 mm in 2011. In comparison, the Stanford station recorded a long-term MAP of 546.3 mm, with the highest annual rainfall of 845.8 mm in 1923 and the lowest of 256.8 mm in 1969.

The data indicates that some monthly discrepancies between the two locations, most notably in May, when the site experienced a significantly higher average rainfall (121.0 mm) than Stanford (63.8 mm). However, aside from May, the data demonstrates a reasonable alignment between the two sites.

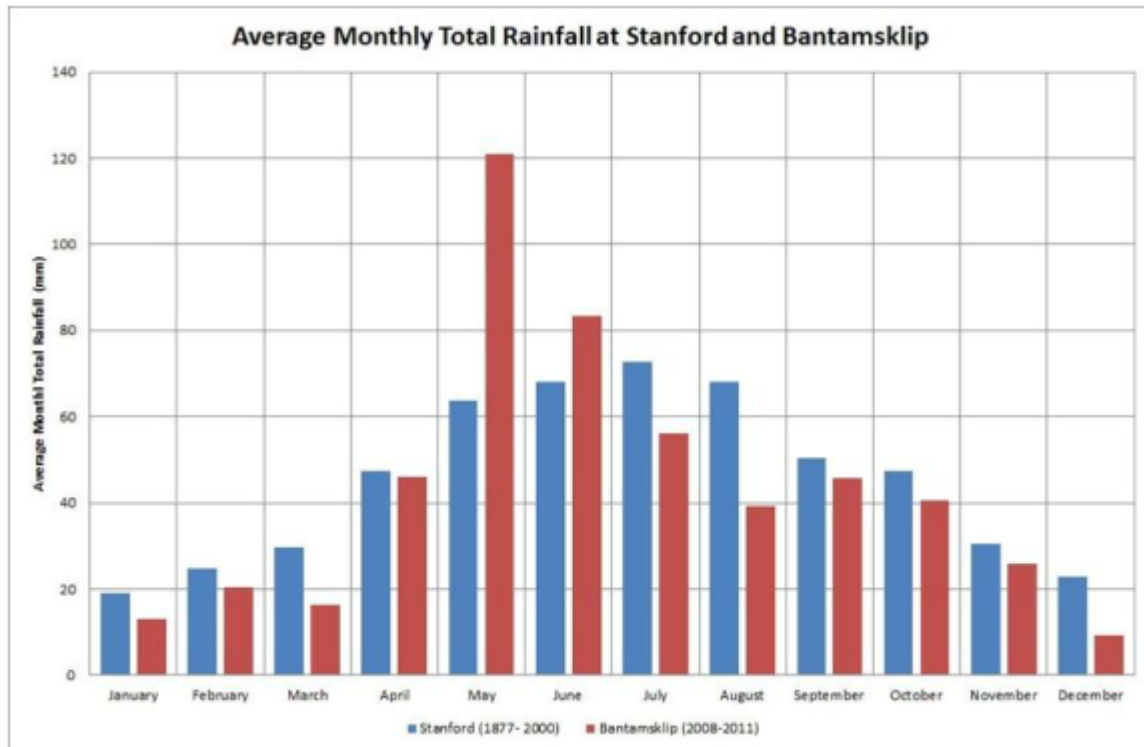


Figure 8-40 – Monthly Rainfall Data at Stanford WS and Bantamsklip WS. Airshed, 2026

Normal monthly rainfall increases during the winter months and decreases during the summer months, as is typical of winter rainfall region, with the site recording:

- The highest monthly averages of 121 mm and 83 mm occurring in May and June, respectively; and
- The lowest monthly averages of 9.3 mm and 13.1 mm occurring in December and January, respectively.

The highest monthly rainfall observed at the site was 214.4 mm and occurred in May 2008. The lowest monthly rainfall on site of 19.1 mm occurred in January 2009.

Humidity

The findings are summarised as follows:

- The highest daily average relative humidity was observed in May at 81.9%, with March recording a slightly lower value of 81.6%. Humidity measurements from the Hermanus station demonstrated similar magnitudes and monthly trends compared to the site observations. The highest daily maximum humidity values at the Hermanus station were recorded in April (84.3%) and February (83.5%).
- The lowest daily average relative humidity at the site was measured in September (76.4%), followed by July (78.1%). The lowest daily maximum and minimum values occurred in July and September, respectively.
- The site's annual average maximum and minimum relative humidity readings were 97.1% and 54.0%, respectively.
- Daily minimum relative humidity measurements at Hermanus were marginally higher than those recorded at the site.

- Daily maximum relative humidity readings were slightly greater at the site than at the Hermanus station. The Hermanus station's annual average maximum and minimum relative humidity readings were 95.4% and 58.8%, respectively.

Solar Radiation

The average monthly solar radiation measurement for December was 27.6 MJ/m².day and 8.3 MJ/m².day for June. The highest solar radiation of 35.7 MJ/m².day was recorded in December. The lowest solar radiation day occurred during June, which recorded 2.1 MJ/m².day.

Water Stress

Agricultural and meteorological drought and wildfire occurrence is projected to increase with high confidence in this area, driven by declining mean annual rainfall and virtually certain increases in temperature. Drought risk is considered likely to increase in the near- and mid-future, with further intensification very likely in the far-future under lower mitigation scenarios. These trends reflect a combination of reduced precipitation inputs and increased evaporative demand associated with warming temperatures.

8.1.11.2 Thyspunt

Wind

Historical data from Eskom (1987) showed that the prevailing wind direction in this region is primarily west-northwest to northwest. More recent wind monitoring data suggests that the prominent wind direction experienced here is from the westerly and easterly wind. The maximum wind speed experienced at Thyspunt between 2019- 2024 was 16.6 m/s. The highest gust recorded at the Thyspunt WS was 32.2 m/s, which was recorded on 24 September 2019 at 07h00.

At the Thyspunt WS (2017–2019), annual average wind speeds ranged from 5.08 m/s to 5.64 m/s, averaging 5.44±0.1 m/s, mostly from the west (21%), west-northwest (14%), and east-northeast (10%). The highest hourly speed was 19.6 m/s from south-southeast. Wind speeds typically peaked in mid-afternoon around 14:00–15:00 due to increased atmospheric instability.

The western wind component remained dominant across all seasons (Figure 8-41), though eastern winds were more common during spring and summer. The frequency of strong westerly winds increases during winter (July to August), alongside greater west-north-west activity¹⁷⁴.

The prevailing night-time wind direction at the Thyspunt WS is from the west-northwest.

An increased frequency of strong westerly winds was observed during spring and winter. Winter also had a significant increased frequency of north-northwest, northwest and north-northwest winds at Thyspunt.

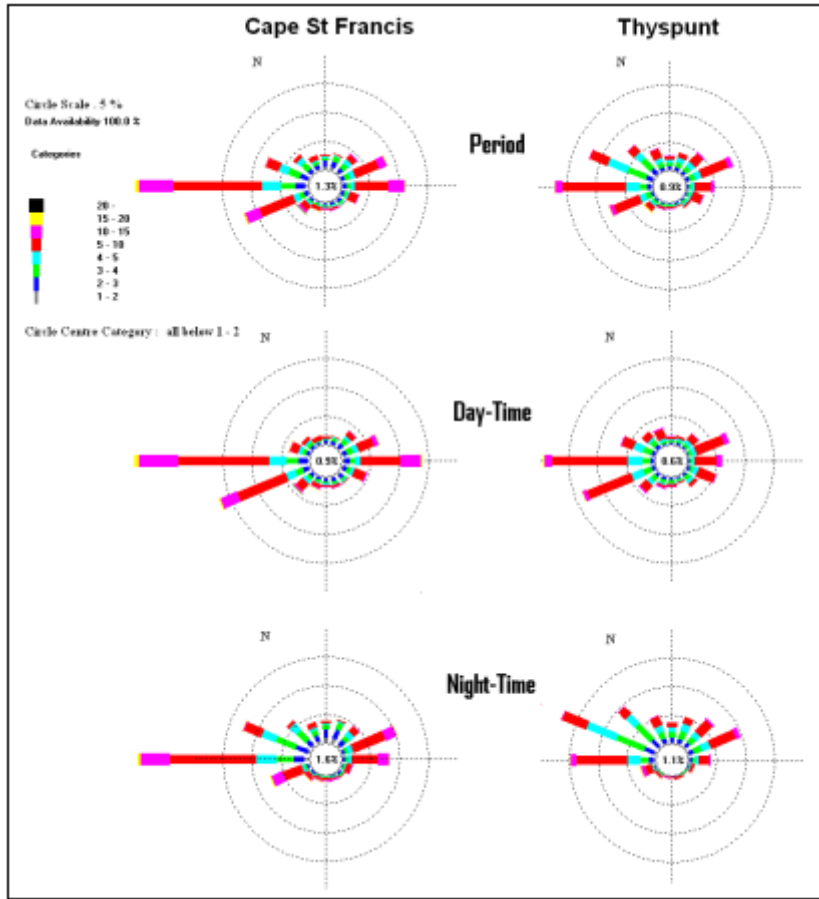


Figure 8-41 – Wind roses for Cape St. Francis and Thyspunt. Gibb, 2016

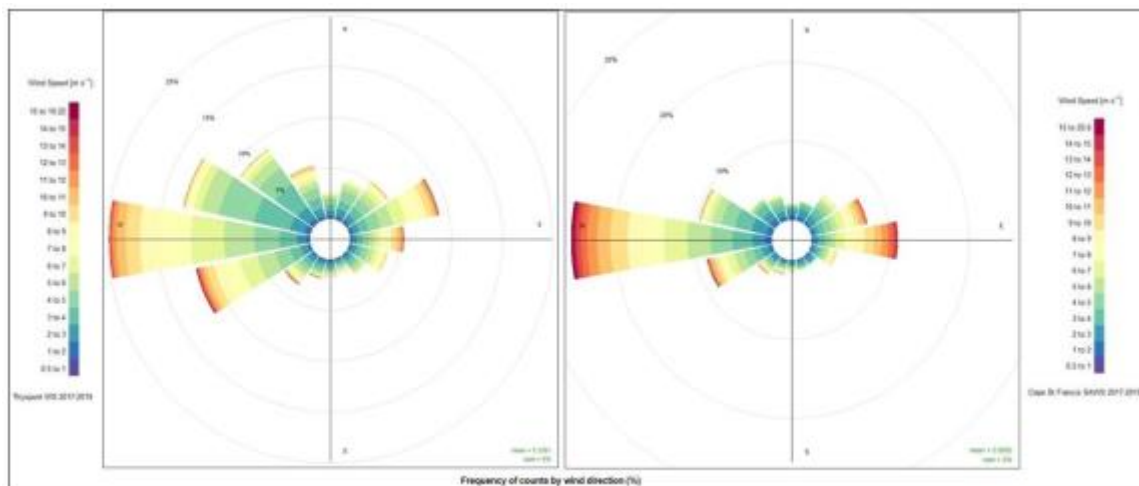


Figure 8-42 – Comparison of SAWS Cape St. Francis WS and Thyspunt WS for 2017-2019 data period. Airshed, 2026

Atmospheric Stability

Annually, neutral stability occurs most often (68.2%), followed by slightly stable conditions at 11.6%. Mean wind speeds for these two stability classes are 5.9 m/s and 5.7 m/s, respectively. Extremely

unstable conditions are rare (3.1%), with mean wind speeds of 2.9 m/s, and extremely stable conditions occur only 1.8% of the time, averaging 2.4 m/s¹⁷⁴.

Ambient Air Temperature

Cape St. Francis air temperature data from 2004-2007 is summarized in Table 8-13. Average daily maximums reach 22.8°C (January and February), while minimums drop to 11.2°C (July). Extreme values recorded were 36.5°C (May) for maximum and 5.0°C (August) for minimum temperatures. Table 8-13 provides further details on means and extremes from 2004 to 2007.

Table 8-13 – Means and extremes of temperature for Cape St. Francis 2004-2007. Gibb, 2016

Month	Average Daily Maximum (°C)	Extreme Maximum (°C)	Average Daily Minimum (°C)	Extreme minimum (°C)
January	22.8	27.4	18.5	12.9
February	22.8	28.3	18.4	14.1
March	21.8	25.5	16.7	12.9
April	19.6	25.3	14.7	9.1
May	19.4	36.5	13.3	7.1
June	18.8	29.0	11.7	6.8
July	18.1	28.0	11.2	6.6
August	17.9	30.5	11.6	5.0
September	18.1	24.4	12.9	7.0
October	19.2	25.5	14.2	8.5
November	20.9	31.1	15.9	11.2
December	22.0	25.0	17.4	12.6
Annual	20.1	36.5	14.7	5.0

More recent data (2004-2023) shows similar trends with:

- Average of the daily maximums: 19.9 °C (average of monthly ADMxT), and average of the daily minimum: 14.2 °C (average of monthly ADMxT).
- The month with the highest average daily maximum temperature of 22.9 °C is January (highest monthly ADMxT), and the month with the lowest average daily maximum temperature of 17.6 °C is July (lowest monthly ADMxT).
- The month with the highest average daily minimum temperature of 17.9 °C is January (highest monthly ADMnT), and the month with the lowest average daily minimum temperature of 10.6 °C is July (lowest monthly ADMnT).
- The annual average temperature (average of hourly average temperatures) is 17.3 °C.

More detailed ambient air dry bulb temperature data is presented in Table 2-3 of the Air Quality Impact assessment Report.

Precipitation

Rainfall at Thyspunt is spread throughout the year, with MAP estimated between 600 mm and 800 mm. Observations from Cape St. Francis weather station reported an annual average of 610.9 mm for June 2004 to 2007, with a mean of 587.9 mm excluding 2004¹⁷⁴.

More recent data (Figure 8-43) shows similar trends with the average monthly rainfall observed at Cape St. Francis WS and the Thyspunt WS both peaked from May to August. The highest monthly totals, with the peak for both Cape St. Francis WS and Thyspunt WS occurred during July, the highest hourly total observed at the Cape St. Francis WS was 37.4 mm (17 December 2022) and at the Thyspunt WS was 51.9 mm (17 March 2011).

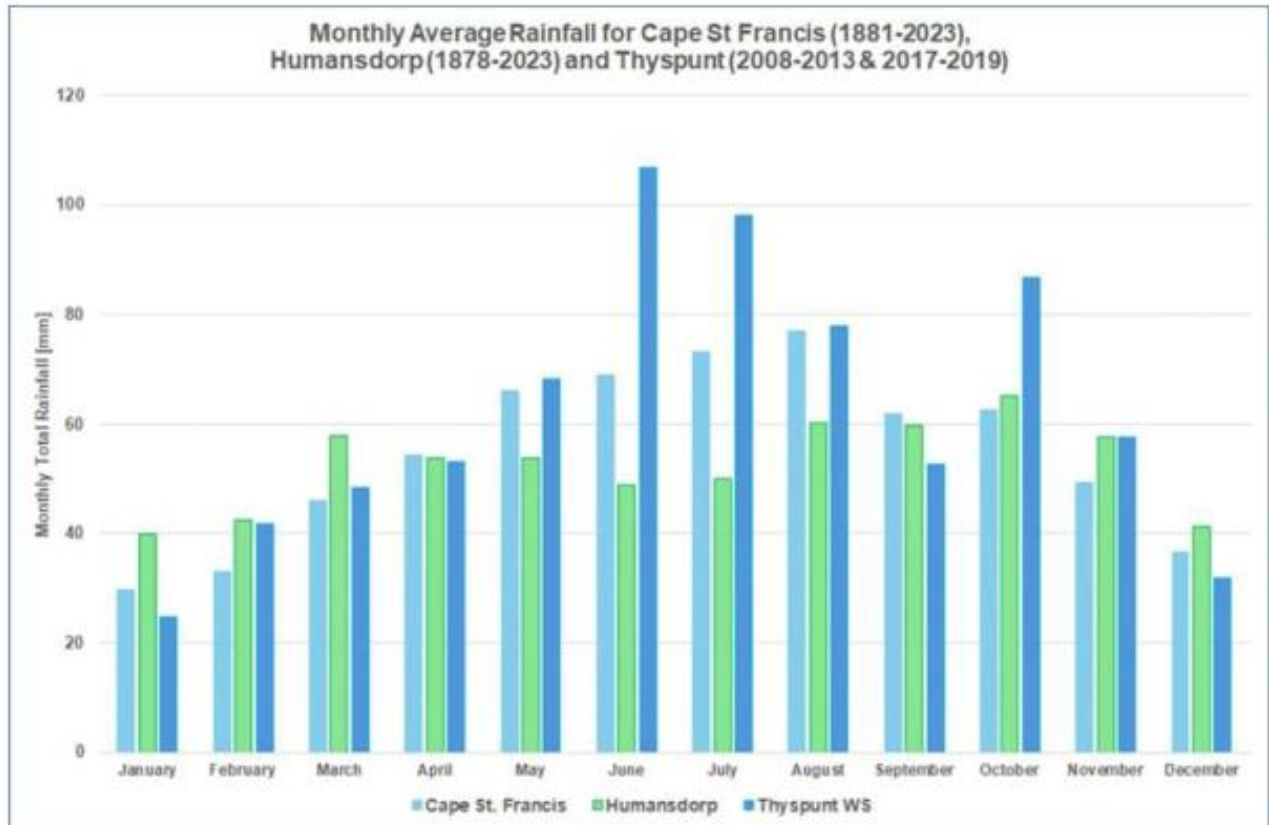


Figure 8-43 – Monthly Rainfall Data at Cape St. Francis WS, Humansdorp WS and Thyspunt WS. Airshed, 2026

Humidity

The findings from data collected between 2008-2013 and 2017-2019 can be summarised as follows:

- The annual average relative humidity recorded was 77% at the Thyspunt WS and 79% at the Cape St. Francis WS.
- The lowest daily average relative humidity recorded at the Thyspunt WS was during July (67%) and during June at the Cape St. Francis WS (73%).
- The highest daily average relative humidity at the Thyspunt WS and Cape St. Francis WS was recorded during February at both sites, i.e. 83.5% and 84%, respectively.
- The relative humidity during summer at a dry bulb temperature of 37 °C was 17.6% at the Thyspunt WS and 14.7% at the Cape St. Francis WS.
- At the coldest hourly temperature during winter 6.6°C (Thyspunt WS) and 4.9°C (Cape St. Francis WS), the relative humidity was 78.8% at the Thyspunt WS and 81.0% at the Cape St Francis WS.

Ambient pressure

Summer coastal lows are clearly observed in this area with monthly average barometric pressures at the Thyspunt WS of 1006.8 hPa (January), 1007.0 hPa (February) and 1007.2 hPa (December). Conversely, winter stagnant high pressures are observed with monthly average barometric pressures at the Thyspunt WS (Table 5.8.31) of 1012.2 hPa (June), 1014.4 hPa (July) and 1012.2 hPa (August).

Solar radiation

The average daily total solar radiation measurement for December was 24 MJ/m².day and for January was 23.9 MJ/m².day and 9.2 MJ/m².day for June.

The highest daily solar radiation was recorded in November with 26.3 MJ/m².day and the lowest daily solar radiation of 8.4 MJ/m².day was during June.

8.1.12 CLIMATE CHANGE

As coastal sites hosting large, long-lived and safety-critical infrastructure, both locations are expected to be influenced by climate-driven coastal processes, including changes in wave, climate, storm surge behaviour, coastal erosion, and inundation risk. In addition, climate change may affect the reliability and performance of interdependent infrastructure systems such as water supply, electricity transmission, transport access, and emergency response networks¹⁸².

The baseline information informing this section has been informed by the Climate Change Impact Assessment drafted by Promethium Carbon (Pty) LTD in February 2026¹⁸².

8.1.12.1 Bantamsklip

Bantamsklip has moderate temperatures, mild seasonal variation, limited extreme heat, and winter-dominant rainfall typical of the Overberg coast. These baseline conditions frame the climate change impact assessment and related vulnerabilities discussed later in this report¹⁸².

Temperature

The mean annual temperatures across the district are expected to rise, with evidence of near-future warming (2021–2040) and further increases anticipated in both the mid- and far-future. District-wide temperature increases of up to approximately 1.5°C by the near future are deemed virtually certain, with sustained warming expected under lower mitigation scenarios moving into later decades. Concurrently, increases in warm temperature extremes and reductions in cold extremes are projected to accompany this trend¹⁸².

At a more localised scale, projections for the Overstrand Local Municipality forecast that average annual temperatures at Bantamsklip will rise by around 1.3°C. These figures align with SANBI's district-level assessments and underscore the moderating effect of the coastal environment, which curtails the extent of warming compared with inland regions¹⁸².

¹⁸² Promethium Carbon (2026). Climate Change Impact Assessment Scoping Report, Proposed Nuclear Power Plant and Associated Infrastructure at Thyspunt and Bantamsklip.

Regarding extreme heat events, very hot days are anticipated to increase inland, while coastal zones are expected to experience notably fewer very hot days.

Rainfall projections for the Overberg District consistently indicate a drying pattern. There is a high confidence projection for a decrease in mean annual rainfall, with reductions probable in the near- and mid-future and more pronounced declines highly likely in the far-future under reduced mitigation scenarios¹⁸².

At the municipal level, projections for Overstrand anticipate a moderate decrease in mean annual rainfall by mid-century, with estimated reductions of approximately 30 mm under a lower-emissions pathway and around 14 mm under a higher-emissions pathway¹⁸².

Rainfall

Further projections indicate a reduction in the frequency of extreme rainfall days across the Overberg District. SANBI reports, with medium to high confidence, a projected decrease in extreme rainfall events, particularly in the mountainous western portions of the district. In line with this, GreenBook projections for Overstrand suggest a decline of roughly one extreme rainfall day annually by mid-century under both emissions scenarios¹⁸².

Water Stress

Agricultural and meteorological drought and wildfire occurrence is projected to increase with high confidence in this area, driven by declining mean annual rainfall and virtually certain increases in temperature. Drought risk is considered likely to increase in the near- and mid-future, with further intensification very likely in the far-future under lower mitigation scenarios. These trends reflect a combination of reduced precipitation inputs and increased evaporative demand associated with warming temperatures¹⁸².

Food Risk

Projections indicate that extreme rainfall events are likely to decrease, particularly over the western and mountainous parts of the district. This suggests a reduced likelihood of flooding driven by extreme precipitation at a district scale¹⁸².

Coastal Dynamics

Coastal dynamics are a key factor for long-lasting, safety-critical infrastructure like the proposed NPP. Alongside gradual sea-level rise, the facility could face rare but severe events during its operational life, such as extreme storm surges and complex coastal flooding caused by sea-level rise, storm surges, and wave interactions. These hazards are recognised at the initial assessment stage as important climate-related risks that need further review¹⁸².

8.1.12.2 Thyspunt

Temperature

Within this broader context, the municipal risk profile reports that Kouga Municipality, including the Thyspunt site, experiences a mean annual temperature of approximately 18°C with minimal seasonal variation. Average summer temperatures (December–February) are around 20°C, whereas winter averages (June–August) hover near 16°C. Regarding extreme heat, these events are primarily confined to the inland Karoo, and the coastal Kouga region has a very low baseline risk

for heat extremes, with fewer than one day per year on average exceeding a maximum daily temperature of 35°C¹⁸².

The historical incidence of extreme heat in this area remains low; noting that the region generally records fewer than one “hot day” (above 35°C) annually.

Temperature and rainfall

Baseline district-level data indicates that the coastal strip and adjacent interior of the Sarah Baartman District fall within South Africa’s all-year rainfall zone, with MAP increasing towards the coastline. Rainfall across the district varies from less than 300 mm in the northwestern interior to nearly 1,000 mm along sections of the coast. The mean annual rainfall at approximately 835 mm, reflecting moderate, year-round precipitation at Thyspunt. This rainfall pattern is well distributed throughout the year, consistent with district-level classifications, and supports generally reliable baseline moisture availability under current climatic conditions¹⁸².

Climate projections for the Sarah Baartman District indicate a clear warming trend over the 21st century with annual temperatures across the district projected to increase, with near-future warming already evident and further increases projected into the mid- and far-future. District-averaged temperature increases of up to approximately 1.5°C in the near future are considered plausible, with further increases projected under lower mitigation scenarios. Warming is expected to be accompanied by an increase in warm temperature extremes and a decrease in cold extremes., The largest increases in extreme heat are concentrated inland, particularly in the Karoo, while the coast remains relatively moderated by oceanic influences¹⁸².

Mean annual temperatures at the proposed site are anticipated to rise by approximately 1.3°C under a low-emissions scenario, and up to 1.7°C under a high-emissions (“business-as-usual”) scenario by mid-century (circa 2050 as cited by Promethium, 2026), compared with the 1986–2015 baseline period. Notwithstanding this projected warming, the coastal zone is expected to exhibit minimal change in the frequency of very hot days (defined as those exceeding 35°C).

Rainfall

Projected rainfall changes demonstrate considerable spatial variability and uncertainty. At the district level, mean annual rainfall is likely to decrease with high confidence, while variations in extreme rainfall events display spatial differentiation, with increases anticipated in interior regions and decreases forecasted for the coastal strip—albeit with low confidence¹⁸².

Projections for the Thyspunt area indicate a slight reduction in mean annual rainfall of about 6 mm under a lower-emissions scenario, and a minor increase of roughly 3 mm under a higher-emissions scenario by mid-century. Regarding rainfall intensity, the number of extreme rainfall days will decline by approximately one day per year across both emissions pathways, consistent with the projection of decreased frequency of extreme rainfall events along the coastal strip¹⁸².

Water stress and drought

Drought risk is projected to increase in the near and mid-future, with further intensification very likely in the far future, including an increased likelihood of multi-year droughts. Oyster Bay, which is in proximity to Thyspunt) has a high projected drought risk, reflecting sensitivity to prolonged dry periods and water supply constraints for the proposed site and surrounding area¹⁸².

Water availability and supply represent a potentially material climate-related risk at Thyspunt. These considerations underscore the importance of water-efficient design, supply diversification, and resilience planning for large, long-lived infrastructure at the site¹⁸².

Wildfire Risk

The coastal strip is expected to remain less exposed to wildfire risk than interior regions due to higher humidity and moderating oceanic influences. Thyspunt has a low projected wildfire risk, with no fire danger days projected under future climate scenarios. This suggests that wildfire is not expected to be a dominant climate hazard for the Thyspunt site¹⁸².

Flood Risk

With a decreasing rainfall trend for the coastal areas, projections indicate a limited likelihood of increased fluvial or pluvial flooding driven by rainfall at the site¹⁸².

Coastal Dynamics

While rainfall-driven flooding risk appears low, coastal processes associated with sea level rise, storm surge, and wave climate change remain relevant considerations and risk for a coastal NPP¹⁸².

8.2 BIOLOGICAL ENVIRONEMENT

8.2.1 FLORA

The baseline information informing this section has been sourced from BioCensus's 2026 Flora Assessment Report¹⁸³.

8.2.1.1 Bantamsklip

The site features several vegetation types: Overberg Sandstone Fynbos, Agulhas Limestone Fynbos, Agulhas Sand Fynbos, Southwestern Strandveld, Southern Coastal Forest, and Cape Seashore Vegetation (Figure 8-44). The project area is primarily within Southwestern Strandveld¹⁸³.

¹⁸³ BioCensus. (2026). Plants Biodiversity Assessment.



Figure 8-44 – Regional Vegetation types occurring on and around the Bantamsklip Site. BioCensus, 2026

The Bantamsklip study area is located within the coastal Fynbos biome of the Agulhas Plain, encompassing a diverse mosaic of dune, strandveld, and lowland fynbos vegetation linked to calcareous sands, sandstone substrates, and exposed coastal conditions. The vegetation exhibits a structurally low to moderate profile and is adapted to nutrient-deficient soils, high wind exposure, salt spray, and frequent fire events. These ecological systems are essential for dune stabilisation, coastal slope preservation, and supporting ecological processes along the Agulhas coastline¹⁸³.

Primary and foredune areas are dominated by salt-tolerant pioneer species, while stabilised dunes and inland habitats support more structurally complex strandveld and fynbos communities, including restioid, ericoid and proteoid elements typical of the Agulhas Plain. Inland communities increase floristic and structural diversity and maintain ecological connectivity between coastal and interior habitats.

Broad-scale vegetation mapping (Mucina & Rutherford, 2006; SANBI VEGMAP) indicates that the proposed infrastructure footprint intersects a coastal mosaic comprising:

- Agulhas Limestone Fynbos
- Agulhas Sand Fynbos
- Cape Seashore Vegetation
- Overberg Dune Strandveld
- Overberg Sandstone Fynbos
- Southern Coastal Forest
- Cape Lowland Freshwater Wetlands

Fine-scale vegetation mapping (Low, 2011 and this study) confirms that infrastructure development would directly affect transverse dunes, coastal sand fynbos, coastal limestone fynbos, neutral–acid

sand fynbos and narrow coastal fringe communities. Among these, Neutral–Acid Sand Fynbos (BK14) is the most species-rich unit recorded on site. Coastal Limestone Fynbos (BK9) and Coastal Sand Fynbos (BK8) are also floristically distinct (Figure 8-45).

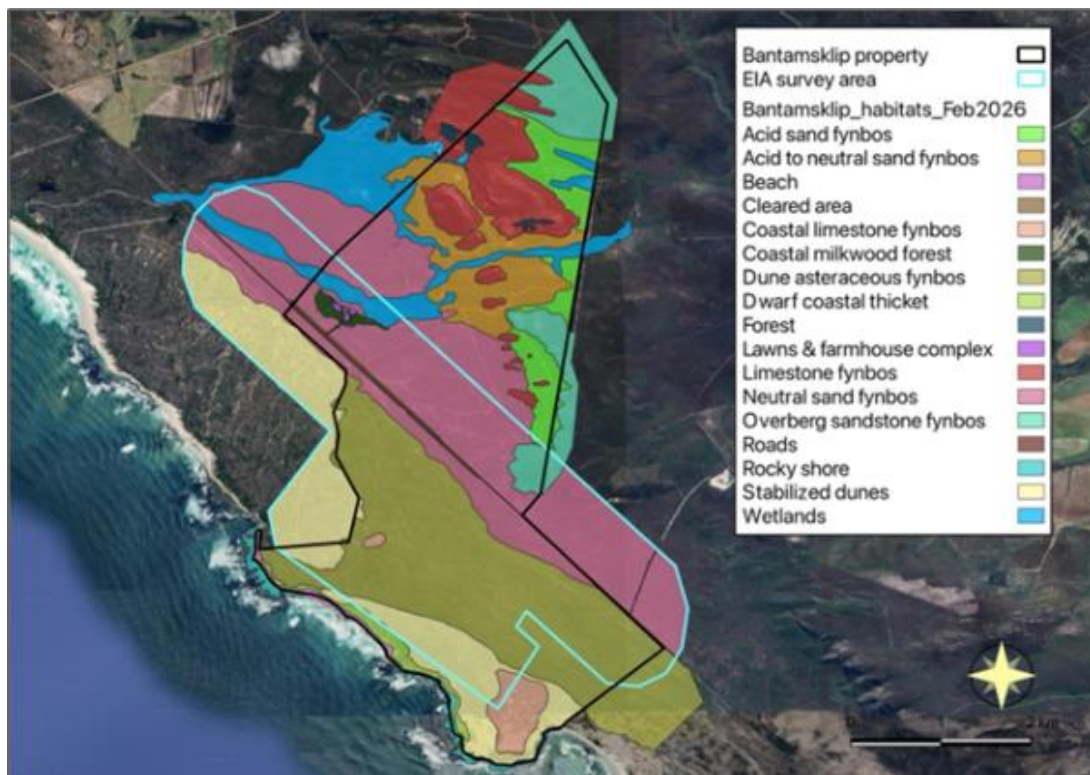


Figure 8-45 – Fine-scale Habitats occurring on and around the Bantamsklip site. BioCensus, 2026

While no plant SCC were confirmed within the exact infrastructure footprint during 2026 scoping surveys, several vegetation communities intersecting or adjacent to the footprint historically supported SCC (according to Low 2011). Surrounding inland limestone, sandstone and wet fynbos communities form an ecologically functional habitat matrix influencing fire regimes, hydrology, invasive species spread and faunal movement. These areas contribute significantly to landscape-level biodiversity sensitivity.

From a conservation status perspective, some dune and strandveld units are classified as Least Threatened. Agulhas Sand Fynbos is listed as Vulnerable (Mucina & Rutherford, 2006) and Critically Endangered under the 2022 National Threatened Ecosystem List. Agulhas Limestone Fynbos is considered Critically Endangered under the 2022 National Threatened Ecosystem List.

Overall, the Bantamsklip site supports moderate to high plant species richness within largely intact coastal fynbos and dune systems of high regional conservation value. Although confirmed SCC overlap with the current infrastructure layout is limited, the presence of suitable habitat and threatened ecosystem types indicates high precautionary sensitivity. Final confirmation of vegetation units to be cleared, together with targeted ground-truthing and SCC verification, is recommended during the EIA phase to ensure accurate impact assessment and mitigation design.

For the current assessment, a total of 301 species were recorded within the proposed development footprint area and surrounding areas with similar habitat. While no plant SCC were confirmed within

the exact infrastructure footprint during 2026 scoping surveys, several vegetation communities intersecting or adjacent to the footprint historically supported SCC (Low 2011).

Overall, the Bantamsklip site supports moderate to high plant species richness within largely intact coastal fynbos and dune systems of high regional conservation value. Although confirmed SCC overlap with the current infrastructure layout is limited, the presence of suitable habitat and threatened ecosystem types indicates high precautionary sensitivity.

The proposed Bantamsklip site is regarded to have “Medium” sensitivity according to the DFFE Screening report and confirmed by BioCensus in their 2026 Assessment¹⁸³.

8.2.1.2 Thyspunt

The site contains three main vegetation types: St Francis Strandveld, Tsitsikamma Sandstone Fynbos (vulnerable), and Cape Seashore Vegetation. Most of the project area is in St Francis Strandveld; the HV yard is in Tsitsikamma Sandstone Fynbos¹⁸³.



Figure 8-46 – Regional Vegetation types occurring on and around the Thyspunt Site. BioCensus, 2026

The Thyspunt study area lies within the Cape Floristic Region and comprises a highly heterogeneous coastal landscape dominated by an extensive parabolic dune system with associated wetland complexes. Vegetation is strongly shaped by dune morphology, wind exposure, salt spray, nutrient-poor sandy substrates and fire, with plant communities playing a critical role in dune stabilisation and coastal ecological functioning. Vegetation succession over time is also an important ecological factor, with older vegetation on the dunes developing to full

forest whereas more recently developed vegetation consisting of early successional plant communities, followed later by fynbos, then thicket.

The vegetation mosaic includes coastal fringe habitats (rocky shore and primary dunes), mobile and semi-mobile transverse dunes, stabilised dune thicket systems, dune fynbos, limestone fynbos, sandstone fynbos, and multiple wetland types occurring within dune slacks and drainage features (notably the Langefontein wetland system). Ecological sensitivity at Thyspunt is driven less by high plant endemism and more by the presence of irreplaceable process-linked systems—particularly mobile dunes and hydrologically dependent wetlands—where disturbance may result in long-term functional degradation.

Broad-scale vegetation mapping (Mucina & Rutherford, 2006; SANBI VEGMAP) indicates that the infrastructure footprint occurs within a coastal mosaic of:

- Tsitsikamma Sandstone Fynbos
- Cape St Francis Dune Thicket
- Cape Seashore Vegetation

Fine-scale mapping (Low, 2011 and this study) (Figure 8-47) identifies the following vegetation communities within or intersecting the proposed infrastructure footprint:

- Coastal fringe communities (T1 Rocky Shore; T2 Primary Dunes)
- Transverse dunes (T3A Stable; T3B Unstable)
- Dune thicket (T4A–T4B Dwarf Thicket; T5A–T5B Tall Thicket)
- Fynbos communities (T7 Dune Fynbos; T8 Limestone Fynbos; T9 Sandstone Fynbos)
- Wetland systems (T10A Coastal Wetlands; T10B Inland Wetlands – Langfontein)

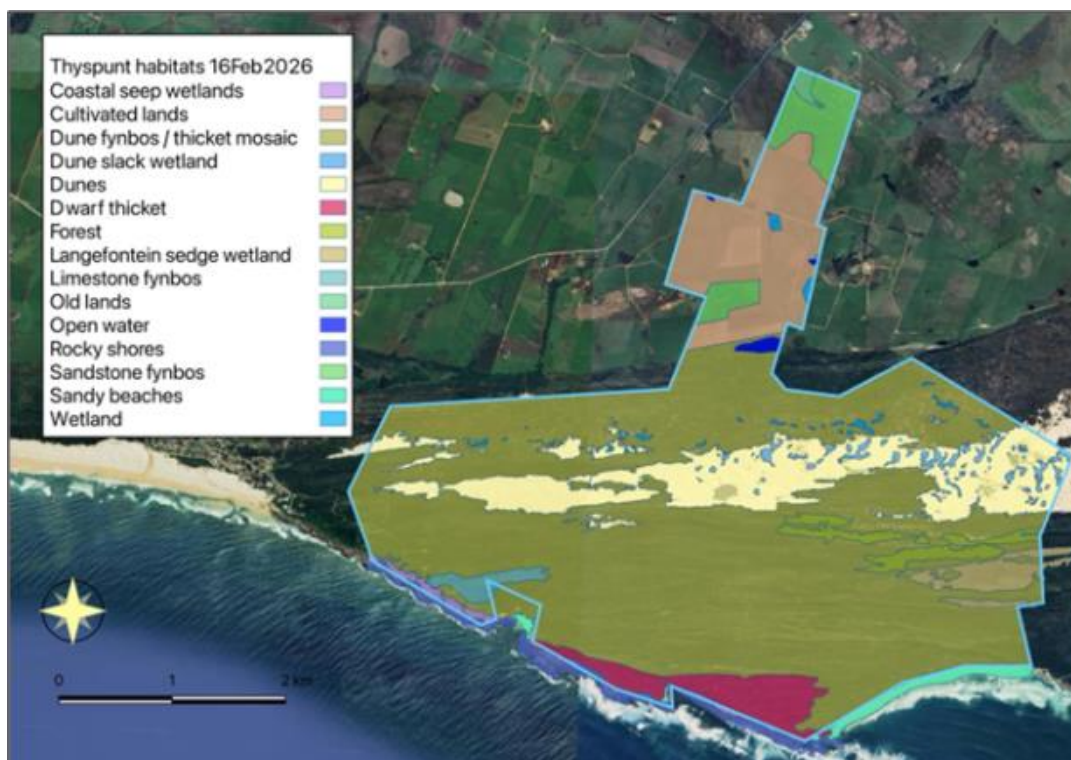


Figure 8-47 – Fine-scale Habitats occurring on and around the Thyspunt site. BioCensus, 2026

Primary dunes and unstable transverse dunes are highly sensitive to disturbance due to erosion risk and dune mobility. Vegetation clearance may trigger renewed sand movement, blowouts and long-term instability. Stabilised dune thicket and tall thicket systems are structurally complex and important for habitat connectivity; fragmentation increases edge effects and invasion risk.

Fynbos units (particularly Dune Fynbos and Limestone Fynbos) represent key biodiversity receptors typical of Cape coastal shrublands. Although most mapped vegetation types are classified as Least Threatened at a national scale, Tsitsikamma Sandstone Fynbos is listed as Vulnerable. Several communities support recorded plant Species of Conservation Concern (SCC), with up to five SCC recorded in Dune Fynbos and four in Limestone Fynbos during the 2011 survey and a total of ten SCC during the current survey.

Wetlands (both coastal and inland dune-slack systems) are of very high ecological sensitivity due to their dependence on intact hydrological processes. Disturbance that alters groundwater–surface water interactions, drainage pathways or dune stability may compromise wetland function and ecological integrity. These systems contribute disproportionately to habitat heterogeneity and biodiversity value.

Overall, Thyspunt supports high plant species richness within a dynamic dune fynbos-thicket-wetland mosaic of high process-based ecological importance. Biodiversity sensitivity is primarily linked to maintenance of dune dynamics, hydrological integrity and landscape connectivity rather than exceptional concentrations of plant endemism. Careful infrastructure siting, avoidance of highly mobile dune systems and wetlands, and maintenance of ecological corridors across dune-wetland gradients will be critical to sustaining long-term vegetation functioning and biodiversity persistence.

A number of communities host documented plant SCC, including up to five SCC found in Dune Fynbos and four in Limestone Fynbos during the 2011 survey. The current survey has recorded a total of ten SCC¹⁸³, their location depicted in Figure 8-48.



Figure 8-48 – SCC Locations within the Thyspunt POAI. BioCensus, 2026

Wetlands, including both coastal and inland dune-slack systems, are characterised by significant ecological sensitivity as they rely on undisturbed hydrological dynamics. Disruptions that affect groundwater–surface water interactions, drainage patterns, or the stability of dunes can undermine wetland functionality and ecological integrity. These environments play a critical role in enhancing habitat heterogeneity and supporting high levels of biodiversity¹⁸³.

Low (2011) identified 383 plant species at the Thyspunt site, with voucher specimens for eight species collected and deposited in the Compton Herbarium, SANBI. However, most species reported were likely sourced from historical collections within the quarter degree grid, potentially limiting their accuracy in representing current site conditions. For this assessment, a total of 225 species were documented within the proposed development footprint and adjacent areas of similar habitat¹⁸³.

Biocensus confirmed that the Thyspunt site does as the desktop information suggests, have a “High” sensitivity rating with respect to plant species.

8.2.2 TERRESTRIAL BIODIVERSITY

8.2.2.1 Bantamsklip

The Bantamsklip study area falls within the coastal Fynbos biome, characterised by a complex mosaic of coastal dune vegetation, strandveld and lowland fynbos communities associated with calcareous sands, sandstone substrates and exposed coastal conditions. These habitats support plant assemblages adapted to nutrient-poor soils, high wind exposure, salt spray and dynamic disturbance regimes driven by coastal processes and fire. Vegetation structure is generally low to moderate in height, with dense ground and shrub layers providing important stabilisation of dune systems and coastal slopes.

The Bantamsklip study site is located within the Agulhas Plain, an area recognised as one of the most botanically significant lowland landscapes within the Cape Floristic Region. Based on the specialist vegetation assessment undertaken by Low (2011), the study area is characterised by a mosaic of endemic, threatened lowland fynbos vegetation types, shaped by underlying geology, soil depth, coastal processes and fire history.

Critical Biodiversity Areas and Ecological Support Areas

The study area was assessed in comparison to relevant provincial spatial biodiversity planning datasets, specifically the Western Cape Biodiversity Sector Plan (WCBSP), to assess the local and regional biodiversity context of the proposed project.

The WCBSP defines five broad biodiversity priority categories as Protected Areas (PAs), Marine Protected Areas (MPAs), Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), and Other Natural Areas (ONAs). The plan further differentiates habitat condition within CBAs and ESAs (e.g., CBA 1; CBA 2; ESA 1; and ESA 2) based on landcover/condition, recognising that some areas may be degraded or may require restoration.

The proposed infrastructure footprint overlaps primarily with areas mapped as CBA: Terrestrial, with additional intersections with ESA: Terrestrial and ESA: Restore from other land uses under the WCBSP (Figure 8-49). The study area is dominated by Other Natural Areas, indicating largely intact natural habitat with limited transformation.

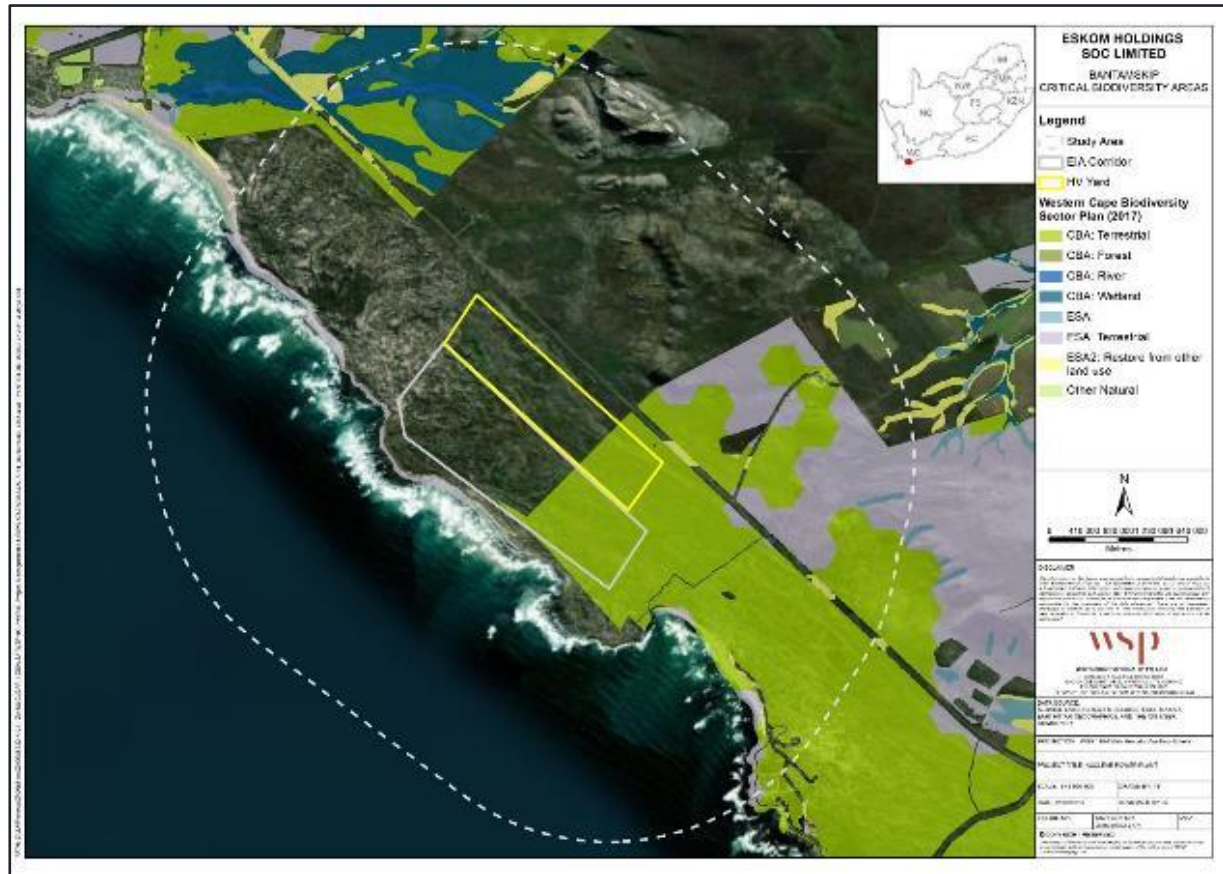


Figure 8-49 – WCBSP of the Bantamsklip site

The National Land Cover dataset (GTI, 2022) indicates that the infrastructure footprint primarily overlaps natural land-cover types, including shrubland, grassland, wetlands and waterbodies, with limited areas of cultivation and historical mining mapped mainly to the north-east of the study area (Figure 8-50).

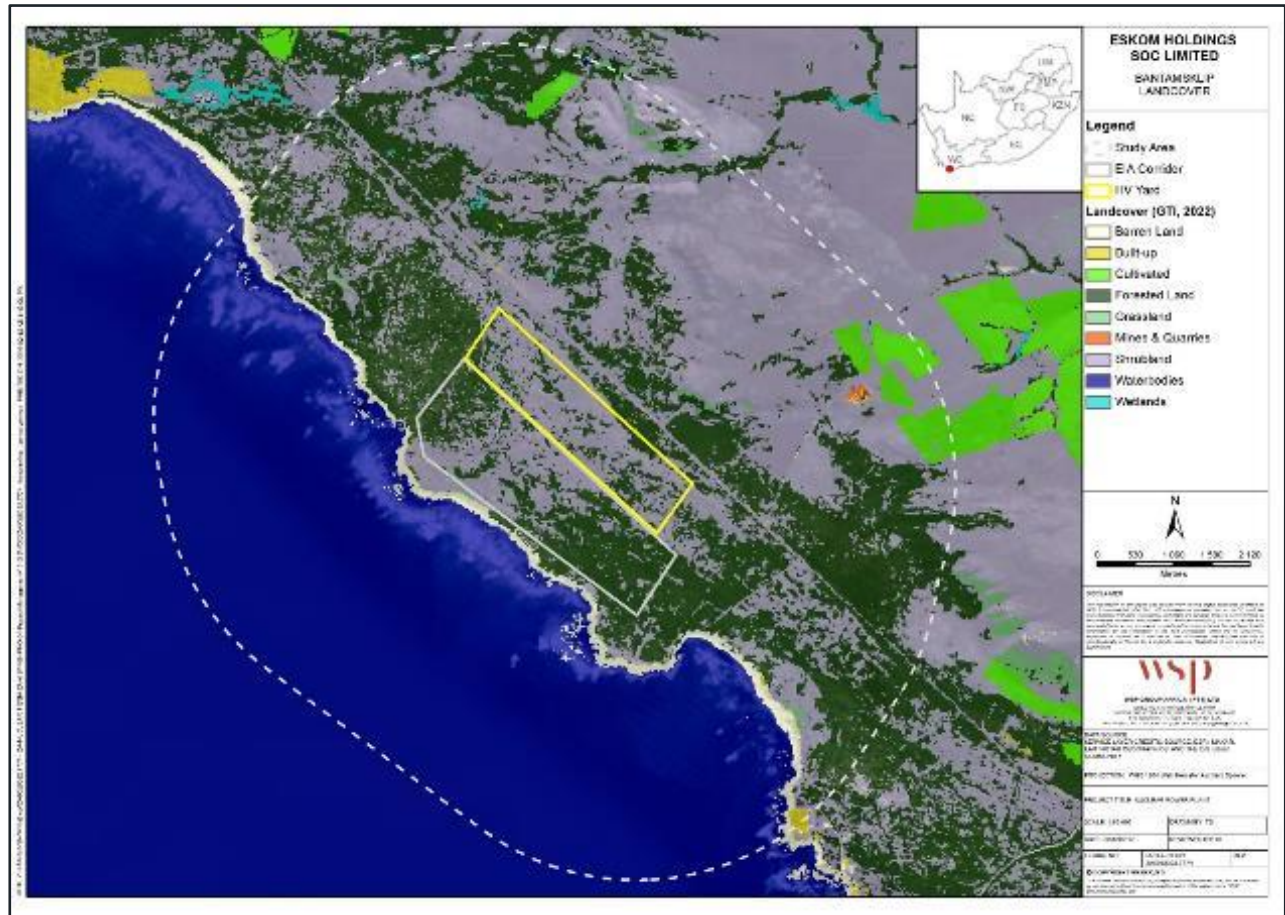


Figure 8-50 – National Landcover Map of Bantamsklip

Protected areas and Priority Areas for expansion

The study area overlaps with priority focus areas identified by the National Protected Area Expansion Strategy (NPAES), which are designated for future conservation initiatives, and two nationally protected areas; the Groot Hagelkraal Private Nature Reserve and the Agulhas National Park, as recorded in the South African Protected Area Database (SAPAD, 2025 Q1) (Figure 8-51).

Vegetation units and Threatened Ecosystems

The entirety of the project footprint overlaps with ecosystems classified as threatened by the South African National Biodiversity Institute (SANBI, 2021) - Southwestern Strandveld and Agulhas Limestone Fynbos are both listed as Endangered. In addition, band of critically endangered ecosystems occurs north of the footprint within the study area (Figure 8-53). This is significant because endangered ecosystems and critically endangered ecosystems are at severe risk of collapse, meaning their ecological functions, species diversity and ability to provide essential services such as water regulation, carbon storage, and habitat connectivity are critically compromised. Any further loss or fragmentation could accelerate biodiversity decline, reduce resilience to climate change and undermine national conservation targets. Consequently, development in these areas triggers stringent legal and policy requirements under the National Environmental Management: Biodiversity Act (NEMBA) and necessitates robust mitigation measures and specialist studies during the EIA phase.

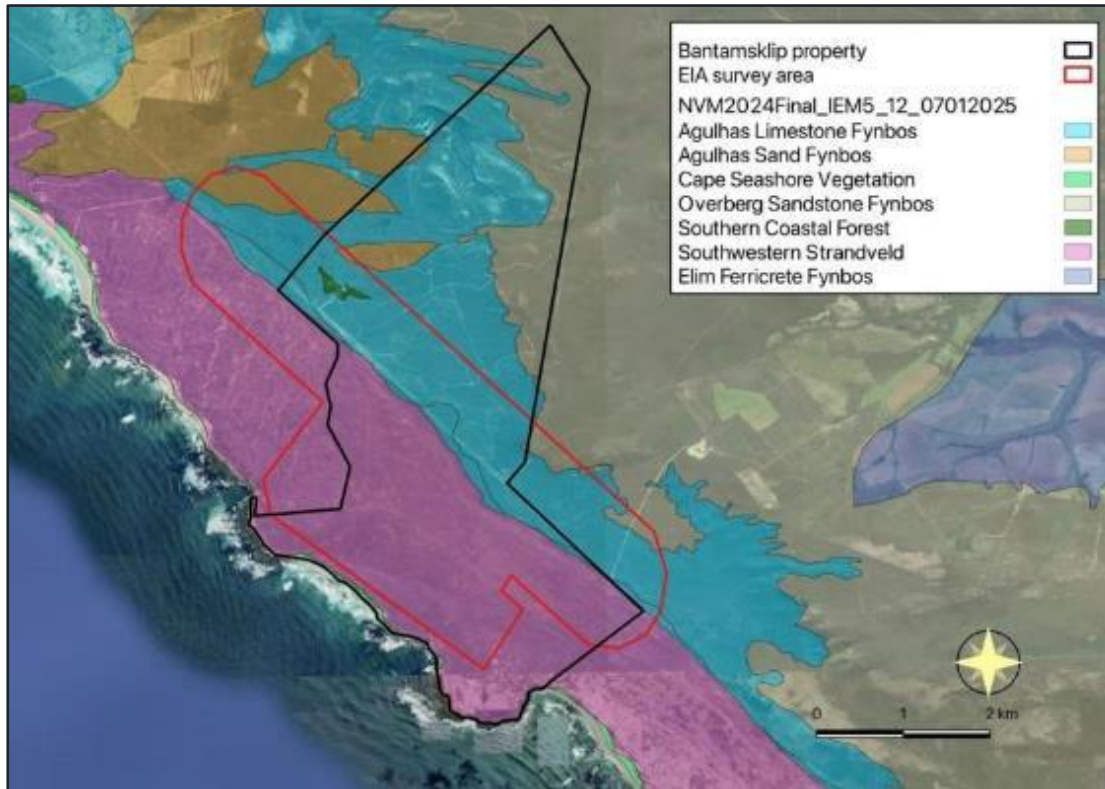


Figure 8-52 – Regional vegetation types occurring on and around the Bantamsklip site

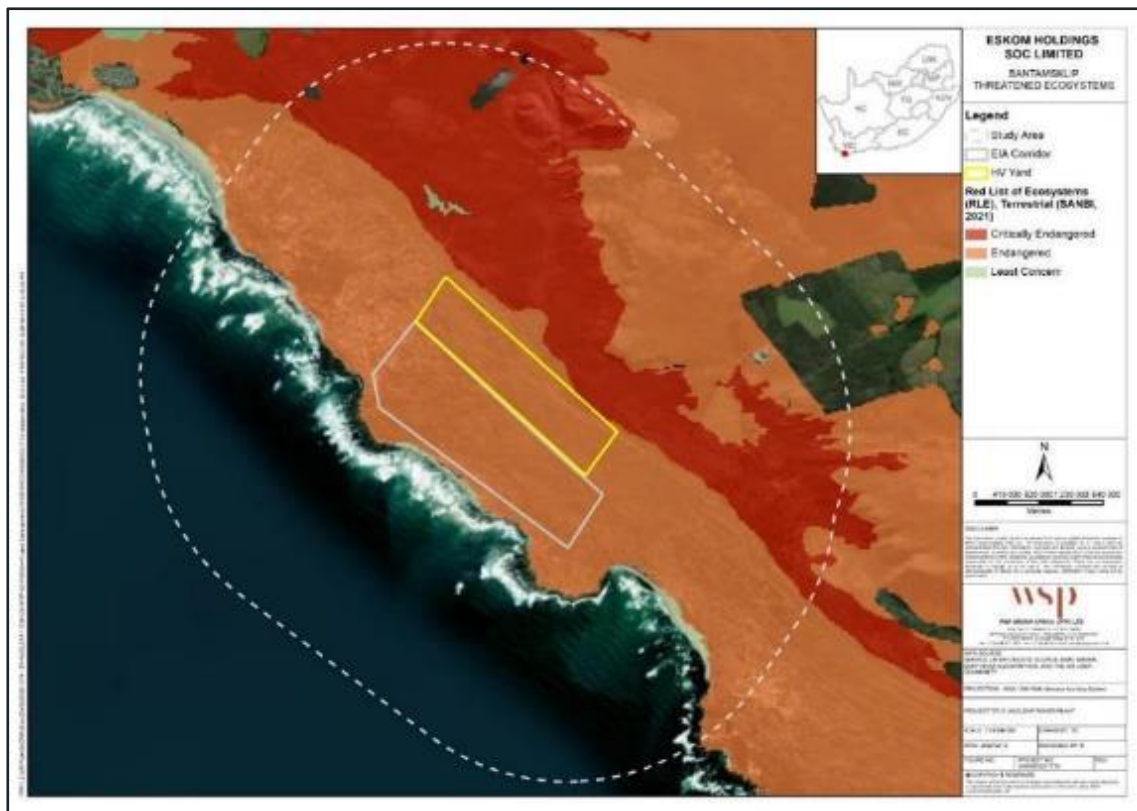


Figure 8-53 – National Threatened Ecosystems of Bantamsklip site

Key Biodiversity Areas

The Bantamsklip site directly overlaps with the Agulhas Coast Key Biodiversity Area (KBA) (**Figure 8-54**). This KBA represents a globally significant biodiversity landscape on the Agulhas Plain that includes substantial portions of the Agulhas National Park conservation estate and surrounding priority habitats. It spans approximately 628 km² and supporting a mosaic of lowland fynbos and coastal dune systems, with documented importance for threatened and geographically restricted biodiversity and threatened ecosystems. This KBA supports >2,000 indigenous plant species, including numerous endemics and Red List taxa, with particularly important lowland fynbos and limestone/dune systems such as endemic Elim fynbos and limestone fynbos communities (e.g., Proteaceae-rich elements including *Leucadendron elimense* and *L. laxum*). Faunal SCC linked to these habitats include the African Black Oystercatcher and large numbers of migratory and resident wetland birds, which are sensitive to habitat fragmentation and disturbance.

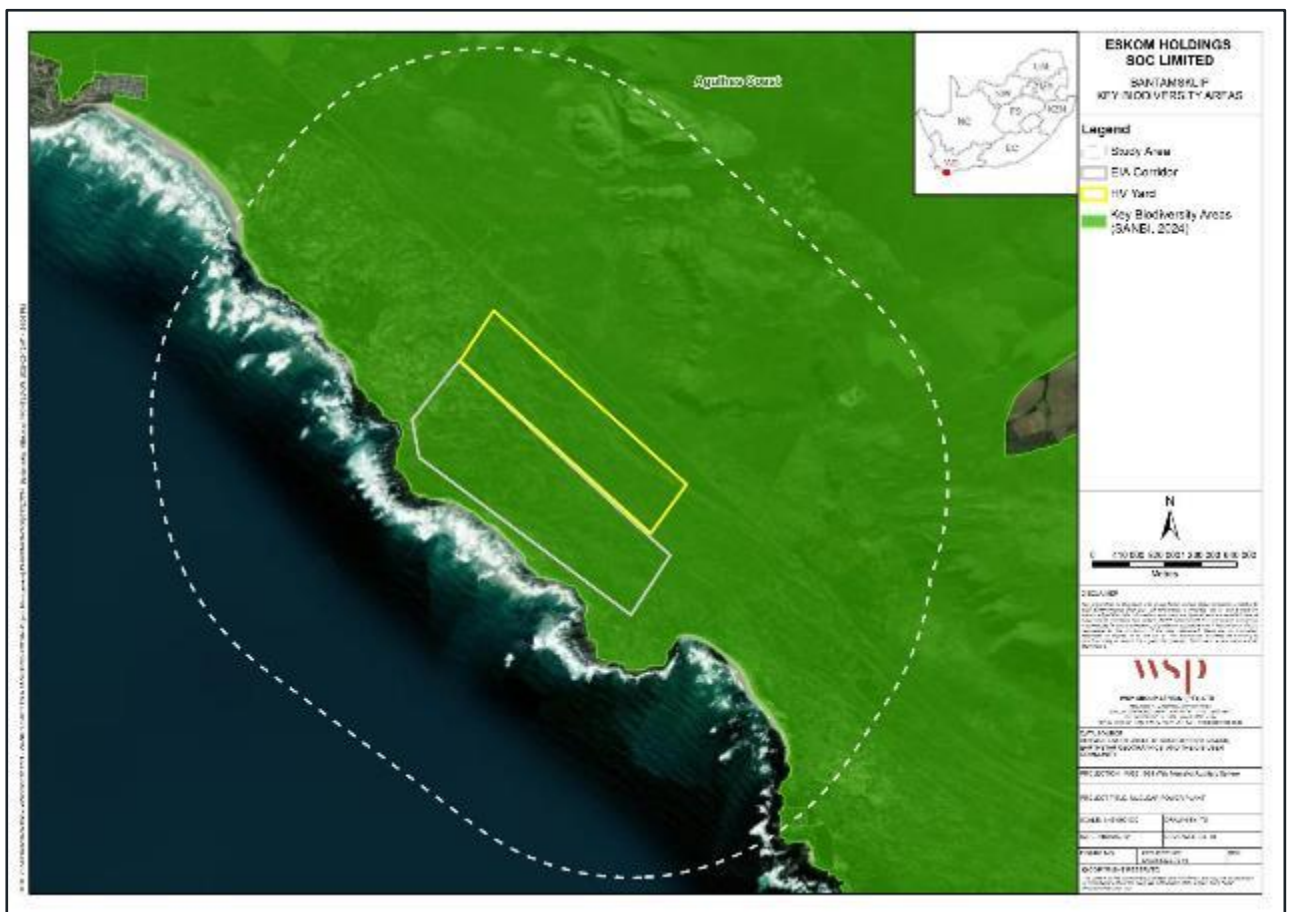


Figure 8-54 – KBAs of Bantamsklip site

The study area contributes to the KBAs overall conservation value by helping maintain ecological connectivity and intact coastal lowland fynbos processes (e.g., habitat continuity across dune–fynbos transitions) that underpin the KBAs qualifying features. This linkage is reinforced by landscape-scale conservation initiatives on the Agulhas Plain (including expansion of formal conservation areas and stewardship agreements), which have progressively increased legally secured habitat and highlight the importance of securing remaining unfragmented natural areas adjacent to the park for long-term persistence of the KBA’s biodiversity.

Ecological Processes and drivers of change

The Bantamsklip study area forms part of the Agulhas Plain coastal lowlands, where biodiversity persistence is strongly governed by interacting ecological processes that operate across the dune-fynbos-wetland mosaic. At a landscape scale, the Agulhas Coast KBA description emphasises a matrix of fynbos shrublands transitioning to dune fields, coastal thicket and inland wetlands, with ongoing pressures from development, tourism and agriculture that can fragment habitat and disrupt ecological functioning. The principal drivers of ecological change at Bantamsklip are:

- **Alterations to the fire regime (frequency, intensity, seasonality and spatial pattern):** Fire is a primary ecological driver in fynbos and is both inevitable and necessary for maintaining vegetation structure, species composition and long-term population viability of many plants. Fynbos species exhibit contrasting post-fire strategies (e.g. reseeding and resprouting), and the persistence of these guilds depends on ecologically appropriate fire regimes. Inappropriate fire frequency (particularly overly frequent burns) can prevent slower-maturing species from replenishing seed banks and completing life cycles, while excessively long intervals can promote senescence and reduce recruitment potential. Fire intensity and spatial pattern are similarly important: many fynbos species require sufficiently intense burns for effective regeneration, and the maintenance of a spatially variable post-fire age mosaic supports biodiversity by providing a range of habitat conditions over time. Activities that alter ignition patterns, suppress fires unnaturally or create hard linear breaks can change fire spread and frequency affecting vegetation composition and dependent fauna.
- **Disturbance to dune processes that underpin habitat stability and turnover:** Coastal dune dynamics are a key process shaping habitat stability and turnover at the dune-fynbos interface. Wind-driven sediment transport, dune stabilisation state, storm exposure, and microtopography influence where dune slack wetlands form, where thicket patches persist, and how fynbos communities are distributed. Disturbance that changes vegetation cover on dunes can shift these dynamics, increasing erosion risk and altering the persistence of dune-dependent habitats.
- **Changes to wetland hydrology and groundwater-linked functioning:** Wetland and groundwater-linked processes are another major driver of ecological function in the Bantamsklip landscape. Seasonal rainfall patterns, groundwater levels, and local catchment hydrology influence wetland hydroperiods, soil moisture regimes, and the distribution of wetland-adjacent vegetation. These systems provide ecological refugia during dry periods, contribute to landscape connectivity, and support key ecosystem functions such as nutrient retention, water regulation, and habitat provision.
- **Alien invasive plant encroachment:** Biological invasions represent a cross-cutting driver of change that can amplify and interact with the processes above. Invasive alien plants can alter fuel structure and continuity (affecting fire behaviour), modify nutrient cycling and soil conditions, and displace indigenous vegetation in both fynbos and wetland margins. Invasion can therefore create feedback loops that increase ecological instability, complicate fire management, and reduce resilience of the native vegetation mosaic.
- **Land-use change and fragmentation pressures:** Even where direct habitat loss is limited, fragmentation can reduce the size and connectivity of remaining fynbos-dune-wetland remnants, increase edge effects and disrupt key ecological linkages such as pollinator movement, seed dispersal pathways, and fauna movement between refugia and foraging areas. Fragmented patches are typically more vulnerable to secondary pressures, including invasive alien plant

establishment, altered fire regimes through increased ignitions and fire breaks, and hydrological disturbance to wetland margins, leading to progressive degradation over time.

These drivers, individually and cumulatively, can reduce ecological connectivity and resilience, increasing risk to biodiversity features of high conservation importance in the broader coastal lowland landscape.

8.2.2.2 Thyspunt

The proposed development site is located at Thyspunt on the Humansdorp coastal plain. Based on the specialist Botany and Dune Ecology assessment (Low, 2011), the Thyspunt study area comprises a heterogeneous coastal mosaic dominated by calcareous dune systems (Algoa Dune Strandveld and Southern Cape Dune Fynbos), with an additional sandstone component (Tsitsikamma Sandstone Fynbos) and a suite of groundwater/dune-slack-associated wetlands and drainage features. Vegetation patterns and sensitivity at Thyspunt are strongly shaped by the interaction between underlying geology and soil chemistry (calcareous dune sands versus acidic sandstone-derived soils), dynamic dune processes (including the large headland bypass dune system), wetland hydroperiods, and fire, which influences the thicket-fynbos mosaic and habitat resilience across the dune landscape.

According to the National Web-based Environmental Screening Tool, the terrestrial biodiversity theme is rated as 'Very High Sensitivity', due to the development footprint overlapping with the following sensitive terrestrial features: Rebelsrus Private Nature Reserve, Ecological Support Area (ESA) 1, Critical Biodiversity Area (CBA) 1 and 2, and the Strategic Water Source Area (SWSA)-Tsitsikamma biodiversity feature.

Critical Biodiversity Areas and Ecological Support Areas

The study area was assessed in terms of the relevant provincial spatial biodiversity planning instruments, with specific reference to the Eastern Cape Biodiversity Sector Plan (ECBSP), to establish the local and regional biodiversity context of the proposed development. The ECBSP identifies and maps biodiversity priority areas across the province and classifies these into four broad categories, namely Protected Areas (PAs), CBAs, ESAs and Other Natural Areas (ONAs). These categories were used as the basis for evaluating the biodiversity sensitivity and conservation importance of the study area.

The study area is situated predominantly within areas classified as CBA 1 and CBA 2 and ESA 1 and ESA 2 in terms of the Eastern Cape Biodiversity Sector Plan (ECBSP) (Figure 8-55). These areas include both terrestrial CBAs and ESAs, as well as ESA: Restore areas associated with previously transformed or degraded land uses that retain an important ecological support function. The spatial distribution of these biodiversity priority categories highlights the high ecological sensitivity of the surrounding landscape and underscores the importance of careful planning and mitigation to avoid or minimise impacts on biodiversity features and ecological processes.

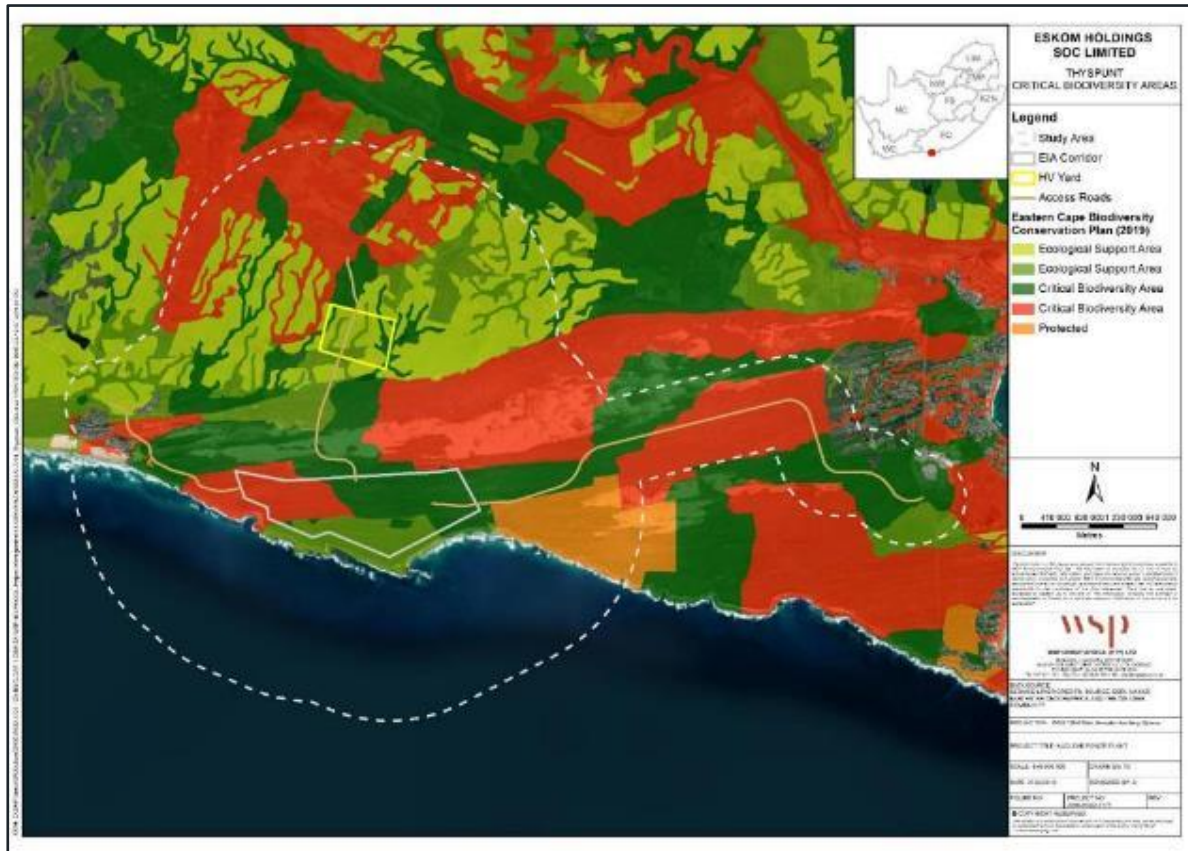


Figure 8-55 – ECBSP of the Thyspunt site

The National Land Cover dataset (GTI, 2022) indicates that the proposed infrastructure footprint is predominantly situated within natural land-cover types, with extensive areas of shrubland and grassland characterising much of the study area (Figure 8-56). Linear wetland features and associated waterbodies are also evident within the broader landscape, particularly along drainage lines and river systems.

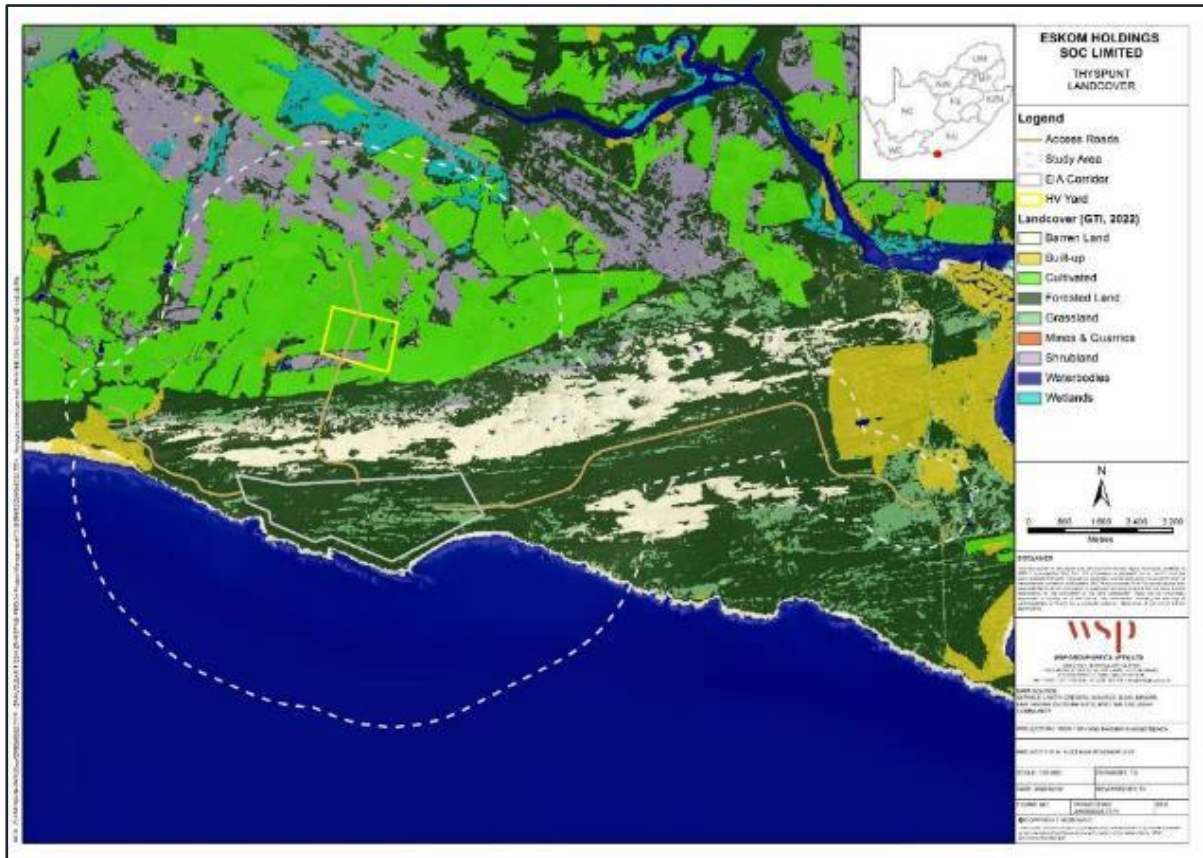


Figure 8-56 – National Land Cover dataset of Thyspunt region

Limited areas of transformed land cover are present, including cultivated land, built-up areas, and historical mining footprints, which are primarily concentrated towards the north-eastern portion of the study area. Overall, the dominance of natural land-cover types reflects a largely intact landscape with relatively low levels of transformation, reinforcing the ecological sensitivity of the area and the need for careful consideration of potential land-use impacts.

Protected areas and Priority Areas for expansion

The study area is located in close proximity to a protected area, with the proposed infrastructure footprint occurring directly adjacent to a nature reserve along its south-eastern boundary. This protected area is identified as Rebelsrus Private Nature Reserve, as recorded in the South African Protected Areas Database (SAPAD) (Figure 8-57).

There is no separate expansion strategy affecting the site, although the CBA, discussed in the section on CBAs and ESAs above, serves this purpose.



Figure 8-57 – Protected areas of Thyspunt site

Threatened Ecosystems

Three major vegetation types occur on the site: St Francis Strandveld (not listed), Tsitsikamma Sandstone Fynbos (not listed), and Cape Seashore Vegetation (not listed) (Figure 8-58). The project footprint is mostly within St Francis Strandveld, but the HV yard is within Tsitsikamma Sandstone Fynbos.



Figure 8-58 – Regional vegetation types occurring on and around the Thyspunt site

Key Biodiversity Areas

The study area is located within the Garden Route KBA, a region recognised for its high terrestrial biodiversity value and ecological connectivity along the southern Cape coastline (Figure 8-59). This KBA supports a mosaic of intact natural habitats, including coastal and inland fynbos, Afrotemperate forest patches, thicket, and associated ecotonal grassland systems, which collectively underpin high levels of species richness and endemism.

These habitats provide important terrestrial habitat for a range of faunal species, including medium to large mammals such as bushbuck (*Tragelaphus sylvaticus*), grysbok (*Raphicerus melanotis*), caracal (*Caracal caracal*), and Cape clawless otter (*Aonyx capensis*) along riverine and coastal interfaces. The area is also significant for smaller mammals, reptiles, and amphibians associated with fynbos and forest ecosystems, as well as a diversity of bird species, including forest-dependent and fynbos-associated taxa.

The largely continuous natural vegetation within the Garden Route KBA plays a critical role in maintaining ecological processes, facilitating faunal movement, and supporting landscape-scale habitat connectivity, thereby contributing to the long-term persistence of terrestrial biodiversity in the region.



Figure 8-59 – Key Biodiversity Areas of the Thyspunt site

Ecological processes and drivers of change

The Thyspunt study area forms part of a highly dynamic coastal dune landscape on the Humansdorp coastal plain, where biodiversity persistence is governed by interacting ecological processes operating across a dune–thicket/fynbos–wetland mosaic. The site is characterised by extensive dune systems (including mobile/semi-mobile transverse dunes) and multiple wetland suites (including coastal seeps and the Langefontein dune-slack wetland), with biodiversity sensitivity driven largely by the coupling between geomorphic dune function and groundwater-linked wetland hydrology. The principal drivers of ecological change at Thyspunt are as follows:

- **Alterations to the fire regime (frequency, intensity, seasonality and spatial pattern):** Fire is a primary ecological driver within the broader fynbos/thicket mosaic at Thyspunt, influencing vegetation structure, successional dynamics, and the balance between dune fynbos and dune thicket elements. Changes to ignition patterns, suppression, or the creation of hard linear breaks (roads/servitudes) can alter fire spread and the spatial pattern of post-fire age classes, with knock-on effects for habitat suitability and recovery potential. Because many habitats occur in a mosaic influenced by exposure and sheltering, fire interacts with dune stability and wetland edges, potentially intensifying secondary impacts where vegetation cover is reduced.
- **Disturbance to dune processes essential for habitat stability and turnover:** Coastal dune dynamics are a defining process at Thyspunt, including a headland bypass dune system described as the largest of its kind on the South African coastline, with extensive dune ridges and slacks and areas of active mobile dunes. Dune mobility, sediment transport, and stabilisation

state determine where vegetation can establish, how dune-slack wetlands form and persist, and how habitats shift over time. Disturbance that removes or fragments stabilising vegetation (e.g., during construction, access management or service tracks) can compromise dune function, increase erosion risk, and trigger long-term habitat instability, with implications for both terrestrial vegetation and wetland persistence.

- **Changes to wetland hydrology and groundwater-linked function:** Wetland and groundwater-linked processes are a major driver of ecological function at Thyspunt. The site supports multiple wetland suites (coastal seeps, dune-slack wetlands, transverse dune wetlands, and wetlands associated with drainage lines and the Slang River system), with many wetlands described as being fed primarily by groundwater and of very high conservation importance. These systems are sensitive to changes in groundwater levels/flows, drainage alteration, compaction, and any disturbance that modifies the dune–wetland linkage that governs hydroperiod and water availability. As highlighted in specialist findings, compromising the functioning of key wetlands (including Langefontein and sensitive coastal wetlands) is treated as a potentially unacceptable outcome because of the difficulty of mitigation and the risk of long-term functional loss.
- **Alien invasive plant encroachment:** Invasive alien plants represent a cross-cutting driver of change at Thyspunt and can interact strongly with fire, dune processes and wetland hydrology. The site has been noted as being heavily infested by woody alien plants (notably invasive acacias in parts), requiring ongoing management. Invasive thickets can alter fuel structure (affecting fire behaviour), displace indigenous dune/thicket/fynbos vegetation, and modify habitat structure in ways that influence dune stabilisation and wetland edge dynamics. Where invasions occur in or near wetlands, they can exacerbate ecological degradation by changing shading, litter dynamics and local water balance.
- **Land-use change and fragmentation pressures:** Land-use change and fragmentation pressures at Thyspunt relate to both direct habitat loss and the creation of linear infrastructure that breaks connectivity across a process-driven landscape. The terrestrial vertebrate fauna assessment identifies fragmentation of natural habitats and animal movement patterns, disturbance of sensitive breeding populations, and mortality risks associated with roads and overhead lines/substations as key impact pathways. At Thyspunt, these pressures are amplified by the need for corridors across extensive dune systems (including mobile dunes), and by the proximity of sensitive wetlands and dune-slack habitats to potential access routes. Even where the direct footprint is constrained, fragmentation can increase edge effects, facilitate invasive alien plant spread, alter fire behaviour, and disrupt the movement of fauna between refugia and foraging areas, driving progressive degradation over time.

These drivers, individually and cumulatively, can reduce ecological connectivity and resilience at Thyspunt, increasing the risk to biodiversity features of high conservation importance, particularly where disturbance affects mobile dune function and groundwater-dependent wetland systems that underpin habitat heterogeneity and persistence across the study area.

8.2.3 WETLANDS

The wetland baseline information has been sourced from Liz Day's 2026 Wetland Scoping report¹⁸⁴. Baseline information has been cited from Day 2011, Low 2009, Day 2013, and SRK's 2013 wetland assessment and verified on site by Liz Day in 2026.

8.2.3.1 Bantamsklip

The Bantamsklip site lies in quaternary catchment G50A, which includes both the Ratel and the Klein and Groot Haelkraal (also called Hagelkraal) River systems, on the Agulhas Plain of the Western Cape, South Africa.

The Agulhas Plain represents one of the most significant remaining reservoirs of lowland fynbos and Renosterveld habitats globally. The region's exceptional diversity of habitat types, wetland ecosystems, threatened plant species, and local endemics is unparalleled within the Cape Floristic Region (Jones et al. 2002) as cited by Liz Day, 2026.

The Bantamsklip site is split into two areas by the R43 road. The eastern boundary follows the surface drainage divide between the Groot Haelkraal and Koks Rivers. The Koks River joins the Ratels River system to the east, while the Groot Haelkraal flows west; much of it lies within the Eskom site. As of January 2026, ground-truthing confirmed previous findings and noted that clearing alien vegetation has expanded wetland conditions in the southern area, with seasonal wetland plants now reaching near the R43 and large stands of *Phragmites australis* reedbeds present.

The section of the Bantamsklip site located south of the R43 is situated beyond the Groot Haelkraal River catchment area. Surveys conducted in both Day (2010) and during the current assessment (January 2026) confirmed the absence of wetland systems within this region¹⁸⁴.

Previous reporting indicates the presence of a coastal seep located at the southwestern edge of the site. However, no wetland vegetation was observed near the potential outflow area. Notably, terrestrial vegetation in this region exhibited signs of elevated freshwater moisture compared to other sections, resulting in dense growths of succulents¹⁸⁴.

The site encompasses extensive wetlands of significant conservation value, which contribute to key downstream ecosystems such as the Pearly Beach Marsh and the Ratels River wetlands. Located on the western side of the Agulhas Plain—from the Klein River mouth to the Breede River—the area is recognized for hosting the largest and most diverse collection of wetlands in the southern Western Cape, with a high potential for supporting rare and endemic plant and animal species (King et al., 1989 as cited by SRK, 2026). These wetlands are distinguished by exceptional diversity in habitat types and biota. Comprehensive conservation of this system has been strongly advocated (Jones et al., 2002).

While multiple seasonal seepage wetlands are believed to exist at Bantamsklip south of the R43 Road (King et al., 1989), the northern portion of the site contains the most ecologically valuable

¹⁸⁴ Liz Day Consulting. (2026). Wetland Scoping report. Aquatic Biodiversity Specialist Study.

systems. This includes the upper reaches of the Koksrivier—a tributary of the Ratels River system—to the east and the Hagelkraal River to the west¹⁸¹.

The Groot Haelkraal River system features several wetland types: hillslope seeps, wetland flats, and braided unchannelled valley-bottom wetlands. Local rainfall aids the recharge of groundwater in the elevated regions of the Groot Haelkraal River's upper catchment. Most of the hillslope seep wetlands are seasonally saturated, with trickle surface flow notes some cases.

Wetland botanical characteristics

The prominent hillslope seeps located near the eastern boundary of the site exhibit a dense plant community dominated by *Berzelia* spp., *Psoralea* spp., *Leucadendron salicifolium*, and *Osmitopsis astericoides*. Within these seeps, intermittent low-lying depressions have developed, ranging from several metres in width to one extensive depression, which supports dense stands of sedges such as *Neesenbeckia punctoria* and *Carpha glomerata*.

The primary channel of the Groot Haelkraal River enters the site from the northeast, traversing a well-defined, unchannelled valley floor that features substantial vegetation across its wetted base, primarily Palmiet reeds (*Prionium serratum*). Downstream, this vegetation transitions into a longitudinal band of at least seasonally saturated wetland, dominated by mixed communities of *Berzelia* spp. and *Psoralea* spp.

As the wetland expands, the dense beds of Palmiet observed upstream are replaced by broad areas of mixed wetland communities. The drier, peripheral zones are characterised by terrestrial and transitional wetland species, including *Elegia tectorum*, *Rhus* spp., and *Metalasia muricata*, while wetter patches support mixed *Psoralea/Berzelia* communities (*Psoralea pinnata*, *Psoralea afilea*, and *Berzelia* spp.).

In January 2026, dense stands of *Typha capensis* were present downstream of the access causeway through the site, whereas *Phragmites australis* was predominant upstream. The braided wetland channels of the Groot Haelkraal River are fringed with dense overgrowth comprising *Zantedeschia aethiopica* (arum lilies), *Juncus capensis*, and *Scirpus nodosus*. These species transition along their margins into *Berzelia–Psoralea* communities, which are typical of most wetlands on the site, as well as stands of *Pteridium aquilinum* (bracken fern). The wetland flats between the R43 and the northern hillslopes are distinguished by stands of *Juncus kraussii*, *Juncus acutus*, occasional *Typha capensis*, and, in certain areas, dense *Phragmites australis*¹⁸⁴.

Wetland Physico chemical Characteristics

SRK (2013) reported that water quality samples from the Groot Haelkraal system indicate the water body is oligotrophic to mesotrophic regarding phosphorus and nitrogen nutrients (nutrient-poor to moderately nutrient-rich but not polluted or over-enriched). Liz Day, 2026 suggest that there is no data that would suggest this status has changed since 2013.

Aquatic invertebrates

The braided channels of the Groot Haelkraal wetland (SRK 2013) supported an invertebrate community similar to riverine types, including two common freshwater amphipod species.

Several red data frog species, such as the critically endangered Micro Frog (*Microbatrachella capensis*), the endangered Cape Platanna (*Xenopus gilli*), and the Western Leopard Toad

(*Amietophrynus pantherinus*), breed in seasonal wetland seeps north of Bantamsklip. The indigenous Cape galaxias (*Galaxias zebratus*) likely inhabit the site's permanent channels¹⁸⁴.

8.2.3.2 Thyspunt

In 2014, the Thyspunt site was distinguished by extensive mobile dune fields closely linked to wetland systems. Wetlands primarily occurred in low-lying interdune “slack” areas. The eastern portion of the Oyster Bay dune field drained into the Sand River, which was an episodic river characterized by shallow subsurface flow except during flood events, when it transported runoff and subsurface water from dunes, adjacent farmland, and developed areas into the Krom River.

Groundwater predominantly flowed across the site from northwest to southeast, discharging along beaches and rocky outcrops into the ocean as well as into the Sand River aquifer situated in the east. Three distinct types of wetlands were present at the site in 2013 and in 2026 (Figure 8-60):

- Wetland depressions within the mobile dune fields, also termed dune slack wetlands. With a Class A (very important EIS), these were depressions found in otherwise sloped terrain, forming against the leeward toe of mobile dunes. Collectively, they constituted an extensive band of seasonally (or non-permanently) inundated pools, varying from less than 30 cm to over 2 m in depth, aligned west-east and becoming more prevalent towards the east.
- Permanently to seasonally saturated hillslope seeps, including the Langefonteinlei wetland complex located on the eastern boundary of the site, with a Class A (very important EIS).
- The hillslope seep wetlands (Class B EIS) include coastal seeps comprising numerous small seeps, which arise just above the high-water mark along the rocky shore. On the original Eskom controlled site, the coastal seep wetlands occur along the rocky shore west of the sandy beach and Thyspunt point itself, as far as the western site boundary and extending on towards Oyster Bay.
- The Northern hillslope seeps (Class C EIS) are within the largely agricultural area to the north of the Oyster Bay dunefield, including in the vicinity of the proposed western access road alternatives.
- The hillslope seeps arising in the area between the two mobile dunefields, the largest of these is the Langefonteinlei.
- Permanently to seasonally saturated unchanneled valley bottom wetlands with a Class A (very important EIS). These are present in the area between the two main mobile dune fields, fed largely by hillslope seeps¹⁸⁴.

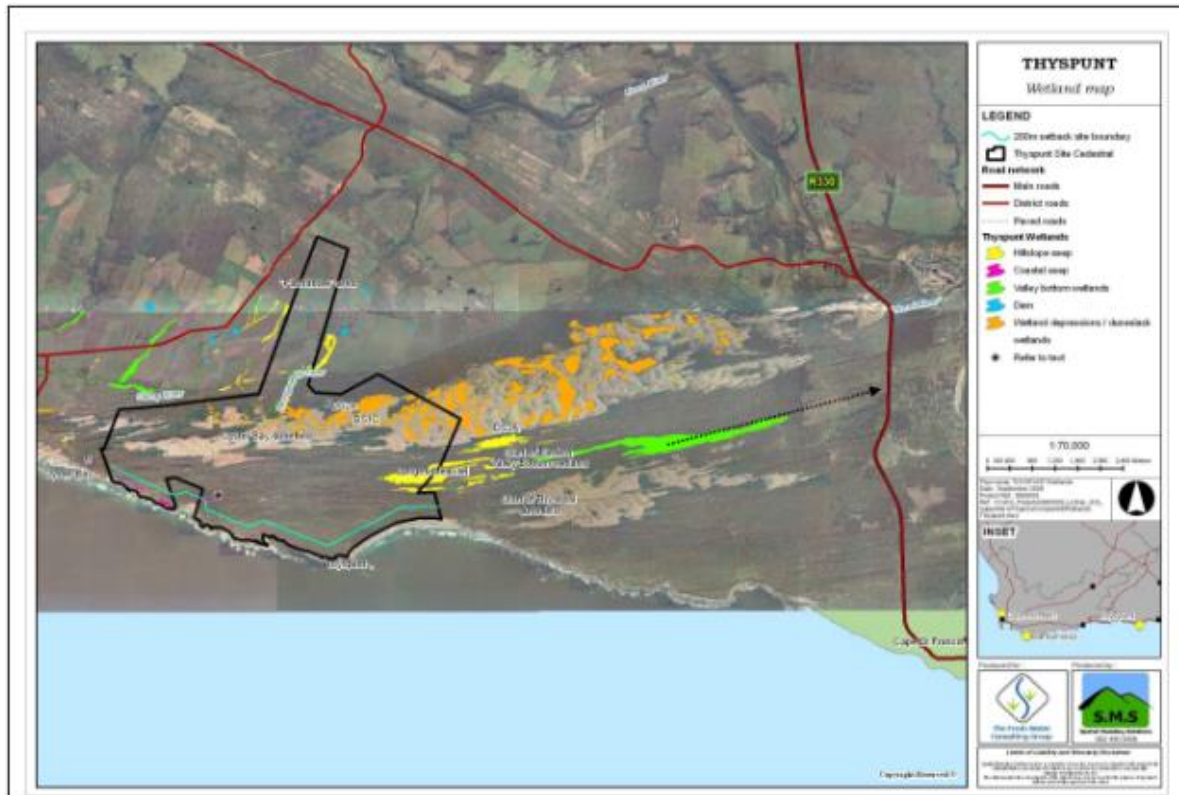


Figure 8-60 – Wetlands that were delineated at Thyspunt in 2013 as cited by Gibb, 2016

The dune systems at the Thyspunt site encompass extensive wetlands that exhibit both spatial and temporal variability. As an integral component of an ecosystem regarded as “one of a kind” and irreplaceable from an environmental perspective (Day 2011 and SRK 2013, as cited by Day 2026), these dunes remain relatively undisturbed habitat types, despite concerns regarding their long-term viability in the absence of sand inputs from the west. Together with the wetland, coastal forest, fynbos, and adjoining coastal areas at the Thyspunt site, they form a complex mosaic of habitats recognized for their significant biodiversity value. Prior biophysical studies within the NPS EIA (Day 2011, Low 2009, Day 2013, and SRK 2013) have identified the continual functioning of these systems and the avoidance of habitat fragmentation or degradation as critically important¹⁸⁴.

At the time of Day (2011 and 2013), local conservation organizations were preparing an application to declare the system a Ramsar wetland site; however, it appears that no progress has been achieved to date. Since then, portions of the dune systems have experienced localized degradation due to sand mining and the installation of a wind turbine array along the northern margin. Additional disturbances include a dump site and quarry situated on the eastern edge of the dunefield. Nonetheless, since 2015, the Kromme Enviro-Trust, a local non-profit organization, has partnered with five wind farm operators through the Greater Kromme Stewardship initiative to promote conservation via biodiversity stewardship, with all costs underwritten by the wind farms. This partnership aims to secure the preservation and protection of ecologically significant habitats in the region, notably including the Sand River Private Nature Reserve located on the eastern section of the Oyster Bay dunefields, encompassing the lower Sand River up to the R330 road crossing¹⁸⁴.

Geohydrology and wetland

Groundwater interactions are integral to the function and distribution for the wetlands within and surrounding the Thyspunt site. SRK (2009) identified two principal aquifers beneath the area:

- The primary, semi-unconfined Algoa aquifer, so named for the superficial sand and cobble deposits of the Algoa Group. Wetlands have formed where the water table is at or near ground level.
- The confined aquifer is situated within fractured TMG bedrock below the Algoa aquifer. Springs frequently occur in the TMG and are controlled by faults or lithological barriers such as the Cedarberg Formation (SRK 2009 as cited by Day, 2026).

Predominantly, groundwater flow traverses the site from the northwest toward the southeast, with discharge occurring along beaches, rocky outcrops into the ocean, and into the Sand River aquifer located in the east (SRK 2011 and 2013). Groundwater movement generally conforms to the site's topographic gradient (SRK 2009 as cited by Day, 2026).

Rivers and wetlands

Wetlands associated with the Thyspunt site are intimately connected with the two mobile dunefields. These serve as major recharge areas for the primary aquifer, which is the driving variable that underlies wetland formation in the broader area between the Oyster Bay dunefield and the sea (SRK 2011 as cited by Day, 2026).

8.2.4 FAUNA – VERTEBRATES

The baseline information in this chapter has been informed by the Animal Theme Scoping Report provided by The Biodiversity Company¹⁸⁵. Desktop information was source from The DFFE National Screening Tool, iNaturalist, Virtual Museum, previous ecology studies¹⁸⁶ on proposed nuclear power plant sites, AfriBugs, Ecocheck,

8.2.4.1 Bantamsklip

The Bantamsklip site is located in a very sensitive area from an ecological sensitivity perspective. The site's Ecosystem Threat status contains areas that are considered Endangered (EN) and Critical (CR) Ecosystems¹⁸⁸. The site is located within an Ecosystem Protection level that is Well Protected (WP), and Poorly Protected (PP). In terms of vegetation types, the site is comprised of both Overberg Dune Strandveld and Agulus Limestone Fynbos. The site and development area fall across various biodiversity priority areas including CBA1 (In natural condition) and Protected Areas (PA) areas.

The site overlaps with two Protected areas, being the Agulhas National Park, the Groot Hagelkraal Private Nature Reserve. The PAOI overlaps with NPAES priority focus areas. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species.

¹⁸⁵ The Biodiversity Company. (2026). Animal Theme Scoping report.

¹⁸⁶ EIA by JAH Environmental Consultancy (Harrison et al., 2011).

The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. The proposed site overlaps with the Agulhus Coast KBA.

Habitat

The habitats found within the POAI and discussed below have been illustrated in Figure 8-61.

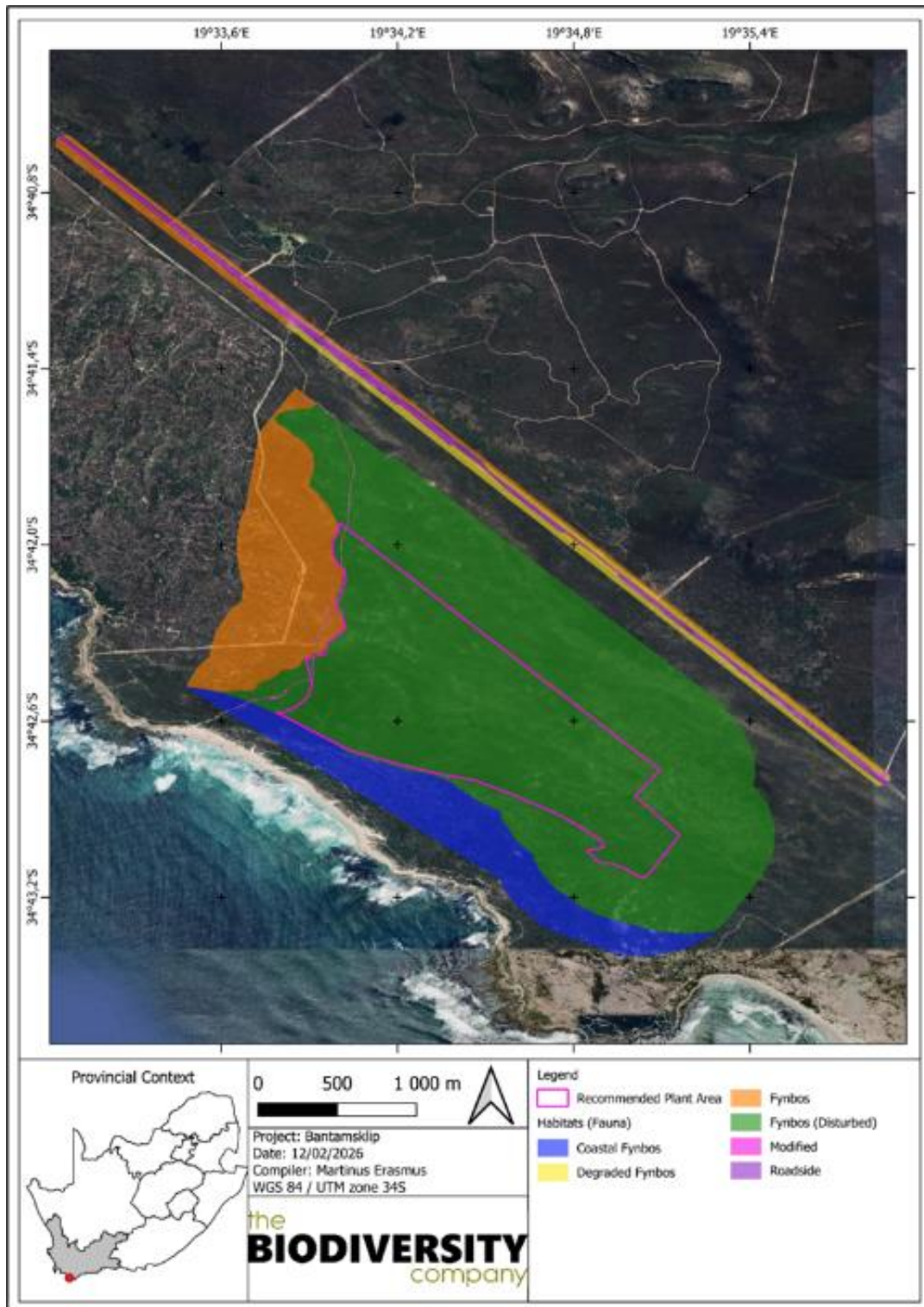


Figure 8-61 – Map of the habitats delineated for the Bantamsklip PAOI. TBC, 2026

- **The Roadside Habitat** - The roadside habitat occurs within the road reserve and is maintained/manicured, resulting in a relatively uniform, low-stature vegetation cover that is not entirely transformed but is regularly disturbed (e.g., mowing/clearing and verge management) (Figure 8-62).



Figure 8-62 – The Roadside habitat observed at the Bantamsklip Site. TBC, 2025

- **Degraded Fynbos** – depicted in Figure 8-63, refers to fynbos vegetation that has suffered gradual damage from road construction and being close to existing roads. This habitat's condition has declined due to long-term disturbances, such as clearing and compressing plants, changing drainage and runoff patterns, as well as ongoing edge effects like increased exposure to light and wind, dust, noise, and frequent human presence. Typically, this results in the habitat being broken into smaller, isolated patches with simpler plant structures and less continuous shrub coverage. The remaining fynbos patches offer some shelter, food, and movement corridors for fauna, but fragmentation, edge effects, and invasive plants reduce habitat quality and increase exposure to predators and disturbance. Roads further threaten wildlife through barriers, vehicle mortality, litter, and human activity. The degraded fynbos here has a low ESI¹⁸⁵.



Figure 8-63 – Degraded fynbos habitat preset on the Bantamsklip site. TBC, 2026

- **Coastal Fynbos** – refers to a habitat situated near the shoreline, represented as a linear coastal corridor characterised by vegetation that is typically in good condition and maintains a robust fynbos and shrub component as presented in Figure 8-64. This area presents a structurally diverse arrangement of shrubs accompanied by an herbaceous layer consisting of grasses and forbs, as well as natural openings. Such features create a dynamic environment that supports

various species, allowing dense cover for refuge and open spaces for foraging activities. Portions of the corridor are distinguished by shallow soils and substantial surface rocks. This coastal fynbos corridor provides key ecosystem services by maintaining coastal ecological connectivity, enabling fauna movement along the shoreline and between adjacent habitat patches, and providing access to coastal resources (including strandline-associated foraging areas where present). The vegetation contributes to sand binding and erosion control, buffering inland areas from wind erosion and helping to stabilise coastal substrates. The coastal fynbos habitat has a High SEI¹⁸⁵.



Figure 8-64 – Coastal fynbos habitat observed at the Bantamsklip POAI. TBC, 2026

- **Disturbed Fynbos** – The Disturbed Fynbos (Overberg Dune Strandveld) habitat features simplified vegetation due to past overburning, alien plant control, and sheep grazing. Shrub cover is sparse and patchy, but the area still stabilises sandy soils, reduces wind erosion, and

maintains ecological functions through its herbaceous layer (Figure 8-65). Flowering forbs support pollinators and food webs, while the grass–forb mix provides seeds and prey for reptiles and small mammals. The disturbed fynbos habitat has a medium SEI¹⁸⁵.



Figure 8-65 – Photos of the disturbed fynbos habitat at Bantamsklip. TBC, 2026

- **Modified habitat** - The modified areas exhibit minimal to no remaining natural vegetation due to extensive land transformation resulting from roads (Figure 8-66). The ecological services provided by this habitat are significantly limited, primarily due to the extensive cover of impermeable surfaces and large expanses of bare land. E modified habitat has a very low SEI.



Figure 8-66 – An example of modified habitat. TBC, 2026

- **Fynbos habitat** - The intact Fynbos habitat (Figure 8-67) is characterised by a well-developed, shrub-dominated vegetation structure across an extensive, undulating dune field. Shrub cover is typically moderate to high and largely continuous, forming a layered mosaic of dune strandveld shrubs interspersed with herbaceous species such as grasses and forbs, alongside natural openings. The varied dune topography results in marked differences between crests, slopes, and swales, creating a high diversity of micro-habitats, including wind-exposed ridges, sheltered lee

slopes, warmer north-facing areas, cooler or moister swales, and dense shrub patches. This structural and topographic complexity offers a wide array of nesting sites, refuges, and foraging opportunities for fauna, thereby supporting a more specialised and sensitive assemblage compared to disturbed, shrub-poor states. Historically, sections of this region were incorporated within the Pearly Beach Nature Reserve, and this legacy of limited transformation and improved protection is reflected in the higher overall habitat quality and integrity was observed. The dune system remains highly sensitive to disturbances such as trampling, vehicle activity, vegetation clearing, and inappropriate fire regimes, which can destabilise surfaces, fragment plant cover, and rapidly diminish habitat quality. In its intact state, the dune strandveld system delivers essential ecosystem services, including effective stabilisation of sandy substrates, mitigation of wind erosion, and maintenance of dune integrity via continuous root networks and robust shrub canopy structures. The diverse layers of shrubs and herbaceous plants sustain complex food webs by supplying nectar, pollen, fruits, seeds, and invertebrate prey, thereby supporting pollination, seed dispersal, and trophic processes for birds, reptiles, and small mammals. The intricate micro-topography of the dune field further enhances ecological resilience by maintaining a spectrum of microclimates and refuges that enable fauna to withstand seasonal extremes and disturbance events. These ecosystem services are closely linked to the continuity of vegetation and stability of the dunes, meaning that disturbances can significantly undermine erosion control, habitat connectivity, and the long-term ecological functioning of the system¹⁸⁵. The fynbos habitat has a High SEI¹⁸⁵.

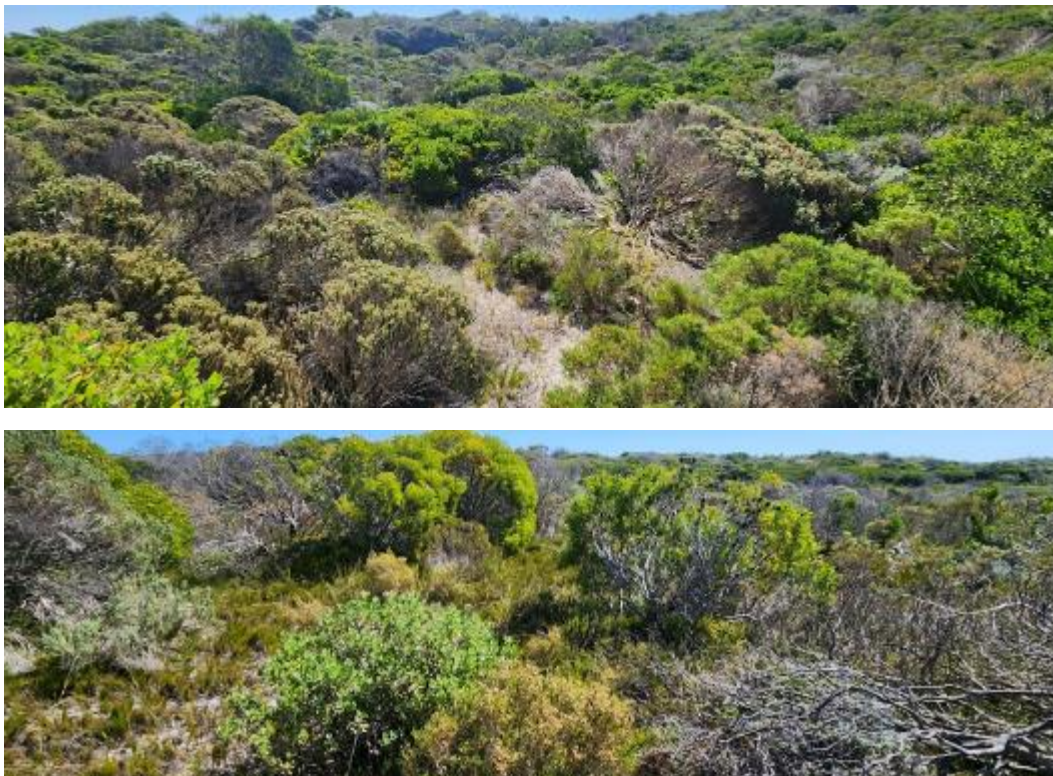


Figure 8-67 – Fynbos habitat at the Bantamsklip site. TBC, 2026

The Bantamsklip habitat site sensitivity and site ecological importance (SEI) has been illustrated in Figure 8-68.

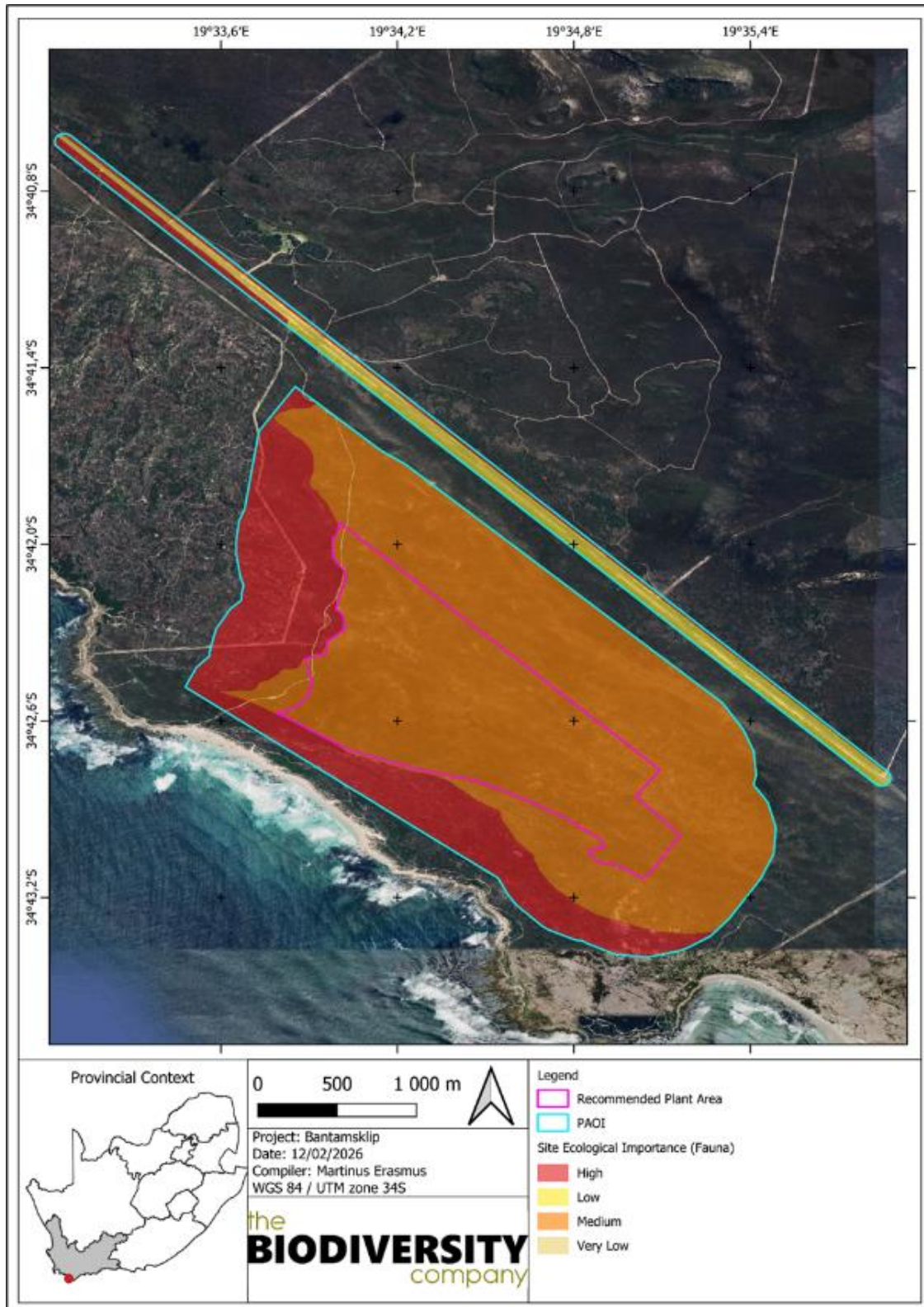


Figure 8-68 – Bantamsklip Habitat SEI. TBC, 2026

Amphibians

From a desktop level, a total of fourteen (14) amphibian species are anticipated within the PAOI, including three (3) amphibian SCCs, the Micro Frog (CR) (Figure 8-69), Gill's Platanna (EN), and the Western Leopard Toad(EN)¹⁸⁵.



Figure 8-69 – The Micro Frog *Microbatrachella Capensis* (Source: <https://natureconnect.earth/>)

The fauna study that informed Gibb's 2012 assessment of the Bantamsklip site¹⁸⁶ found Rose's Rain Frog *Breviceps rosei* (LC) near the proposed site in 2011. Harrison et al., 2011 noted that the highest amphibian sensitivity at Bantamsklip lies on the inland portion (Hagelkraal) due to threatened-breeding wetlands.

No species of SCC were identified in TBC 2026 survey. The Clicking Stream Frog and Raucous Toad (both LC) were identified on site in the 2026 assessment¹⁸⁵.

Reptiles

Thirty-one (31) reptile species are expected for the Bantamsklip PAOI with one (1) reptile SCC are expected to occur here, the Southern adder. *Bitis armata* (VU)¹⁸⁵. The Cape Girdle Lizard, Rhombic Egg-eater snake, and Delalande's Beaked Blind Snake were noted on site in the 2026 biodiversity assessment¹⁸⁵.

Mammals

Twenty-seven (27) mammal species could be expected to occur within the PAOI, two (2) of which are SCCs, the bontebok and Leopard¹⁸⁵. Harrison et al., 2011 noted four probable mammals on or near the proposed Bantamsklip site, including the Fynbos Golden Mole *Amblysomus corriae*, White-tailed Mouse *Mystromys albicaudatus*, Honey Badger *Mellivora capensis*, bats and some common meso-carnivores such as the Cape Grey Mongoose.

TBC noted seven (7) species of mammal within the PAOI during their wet season 2025 Survey, none of which were of SCC. These included Cape Dune Mole-rat, Cape Gysbok, Cape Fox, Chacma Baboon, Cape Grey Mongoose, Cape Porcupine, Striped Polecat, and Cape Genet¹⁸⁵.

8.2.4.2 Thyspunt

Both a literature desktop study and an in-field wet season survey by TBC informed this section on the baseline characteristics of the Thyspunt site.

The Thyspunt site is also considered a sensitive site in terms of ecosystem sensitivity and protection status. The site has an Ecosystem Threat status of Least concern (LC), with a small section that overlaps with an Endangered Ecosystem Threat status in the western part of the site. The majority of the site is located within Poorly Protected (PP) areas with a small area to the north and far western side of the site falling within a Well Protected (WP) area.

According to the Conservation Plan, the PAOI and development area fall across various biodiversity priority areas including CBA1 (in natural condition), CBA2 (Degraded/secondary vegetation), ESA1 (Natural/near natural/moderately degraded conditions), ESA2 (severely degraded/no natural cover remaining), and borders a Protected Area (PA) on the Eastern side of the proposed location. This PA is the Rebelsrus Private Nature Reserve. The site is located within 5 km of 11 other SACAD areas, being Cape St. Francis Provincial Nature Reserve, Eastcot Private Nature Reserve, Franscois and Annelie Marits Private Nature Reserve, Irma Booysen Flora Reserve, Kromme Geelhout Protected Environment, Kromme River Mouth Private Nature Reserve, Mosterthoek Nature Reserve, Rebels Nature Reserve, Sand River Private Nature Reserve, St Francis Sands Nature Reserve, Thula Moya Nature Reserve¹⁸⁸.

The site does not overlap with any NPAES priority focus areas. The site development area and the PAOI overlap with the Graden Route KBA and with CR and EN wetlands associated with the dune fields. These wetlands from a desktop level are considered priority and non-priority NFEPA wetlands

The road overlaps with a “no-go” area for a plant species as identified by the EWT.

Habitat

The site is located within the Cape Floristic Region, which is largely restricted to the Western Cape and Eastern Cape provinces. This is and was an exceptionally biodiverse region with very high levels of species endemism. In 2016, the CFR had been identified as a global Biodiversity Hotspot and was the focus of the Cape Action for People and the Environment. The site was registered with the DEA as a Natural Heritage Site¹. The site was environmentally varied and complex, with several distinctly different habitat types, a complex topography with intricate drainage, and a varied coastline. Despite the proximity of the towns of Cape St. Francis in the east and Oyster Bay in the west, the site remained remarkably wild and unspoilt.

Habitats identified on the Thyspunt site were largely comprised of the Algoa Dune Strandveld (Least Threatened) covering the majority of the area, Southern Cape Dune Fynbos (Least Threatened) on a relatively large area, a narrow coastal strip of Cape Seashore Vegetation (Least Threatened), and a relatively small area of Tsitsikamma Sandstone Fynbos (Vulnerable) on an inland extension of the site. The inland “panhandle” portion of the site had been largely transformed by agriculture. In addition, there were small patches of thicket which had matured into low forest; also thickets of invasive alien vegetation, mainly Rooikrans *Acacia cyclops* and Port Jackson Willow *Acacia saligna*. Between the coastal and inland portions of the site lay an extensive transverse mobile-dune field with interspersed vegetated areas and seasonal wetlands¹.

The delineated habitat types have been provided in Figure 8-70.

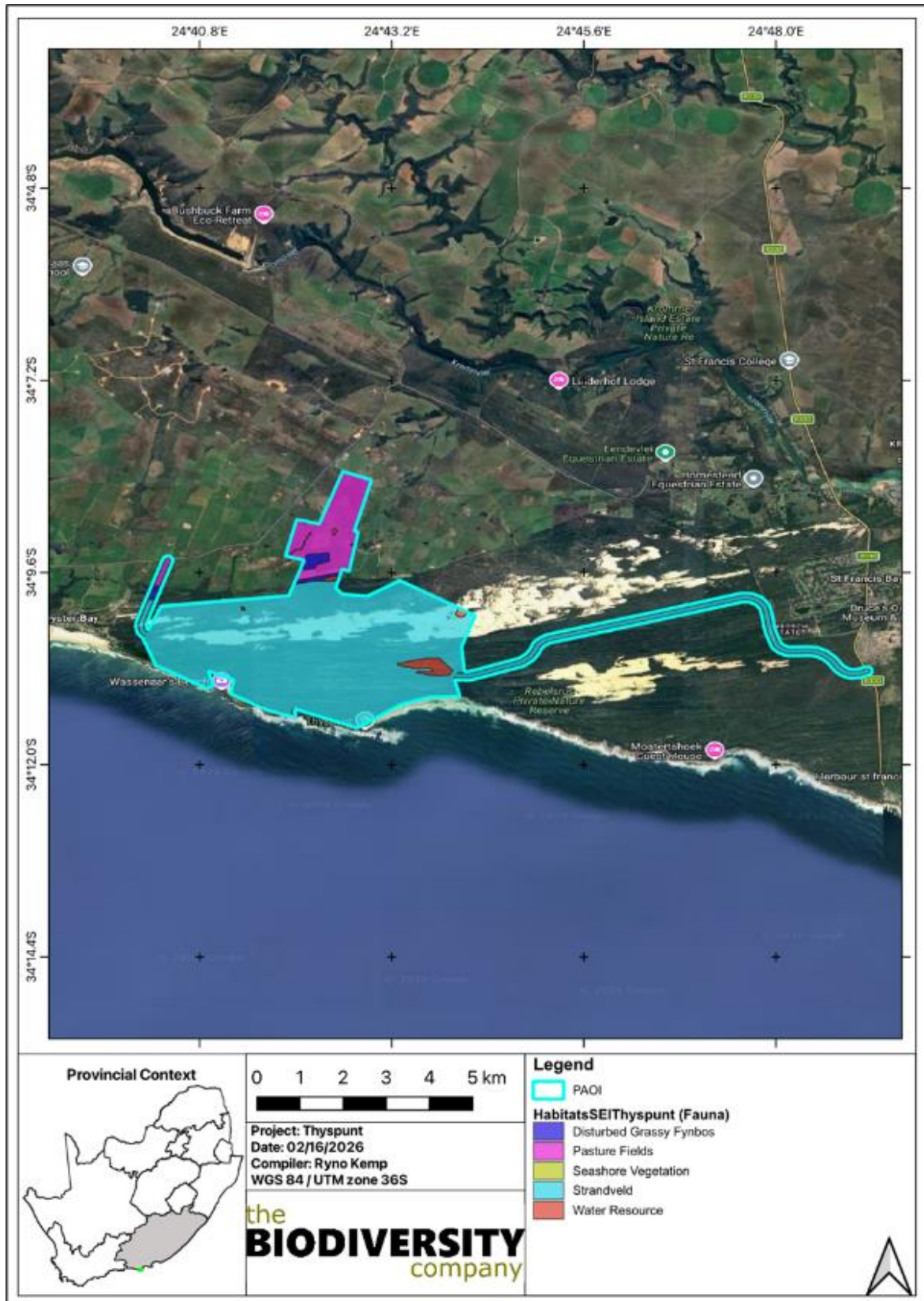


Figure 8-70 – Thyspunt habitat delineation. TBC, 2026

- **Disturbed Grassy Fynbos** - Figure 8-71 refers to an area that has experienced significant alteration from its original condition due to the encroachment of invasive and non-native plant species. The characteristic low-growing shrubs of the Fynbos have largely been replaced by grasses, bracken, and invasive wattle trees. Nonetheless, this habitat continues to serve as a breeding and foraging environment for most of the anticipated SCC species. This habitat has a low SEI¹⁸⁵.



Figure 8-71 – Disturbed Grassy Fynbos within Thyspunts POAI. TBC, 2026

- **Pasture fields** – These areas have been transformed from their natural vegetation and have little to no remaining natural vegetation to facilitate pasture fields for livestock (Figure 8-72). Although being degraded, these areas provide suitable foraging areas for local fauna. This habitat has a low SEI¹⁸⁵.



Figure 8-72 – Pasture field habitat within the Thyspunt POAI. TBC, 2026

- **Seashore Vegetation** -This habitat is part of the Azonal Vegetation biome and represents Cape Seashore vegetation (Figure 8-73). It features beach and coastal dunes with grass, herbs, and dwarf shrubs. Because it occurs on moving dunes, its structure and composition change over time. Residential development and beach visitors currently impact this area. This habitat has a High SEI¹⁸⁵.



Figure 8-73 – Seashore Vegetation habitat at Thyspunt. TBC, 2026

- **Standveld** – This habitat, part of the Azonal Vegetation biome and Southwestern Strandveld type, features dwarf shrubs and herbaceous plants (Figure 8-74). Found on moving dunes, its structure changes over time, with vegetation ranging from tall thickets to forest in areas within the Thyspunt POAI. This habitat has a medium SEI¹⁸⁵.



Figure 8-74 – Standveld Habitat within the Thyspunt POAI. TBC, 2026

- **Water resources Habitat** - The water resources within the project's area of influence include a wetland located in the road buffer zone (**Figure 8-75**). This area primarily consists of reeds and other aquatic vegetation that remain inundated with water. These ecosystems deliver critical regulating services by attenuating flood peaks, temporarily storing water, and decelerating runoff, which collectively mitigate downstream erosion and safeguard adjacent infrastructure. The wetland vegetation is instrumental in improving water quality through sediment capture, nutrient retention, and facilitating biogeochemical processes such as denitrification—thereby reducing pollutant loads. Additionally, these wetlands provide essential supporting services, serving as habitat and breeding grounds for wetland-dependent fauna (including amphibians, birds, and aquatic invertebrates) and sustaining local biodiversity corridors within an otherwise altered landscape. This habitat has a High SEI¹⁸⁵



Figure 8-75 – Water Resource habitat observed in the Thyspunt POAI. TBC, 2026

Amphibians

There were 15 possible amphibian species that were probable or confirmed on site in the 2010 assessment that informed the Gibb, 2011 EIA. As confirmed by TBC, 2026, none of the species are threatened, or SCC. There were some important conservation issues around amphibians on site. The wetlands in the dune fields at Thyspunt were occupied by several amphibian species. A population of Cape Sand Toad *Vandijkophrynus angusticeps* was of special interest because it was at the eastern extremity of its known range, here. The population was probably isolated from all other populations of this species and might, therefore, have been genetically and even taxonomically distinct, and should have been regarded as a rare, important and sensitive population requiring the highest levels of protection¹⁷⁴.

Also of considerable interest were the frogs that occupied the coastal wetlands and seeps above the rocky shoreline. Six species (*Xenopus laevis* – Common Platanna, *Amietia angolensis* – Common River Frog, *Cacosternum nanum* – Bronze Caco, *Strongylopus fasciatus* – Striped Stream Frog, *Strongylopus grayii* – Clicking Stream Frog, *Tomopterna delalandii* – Cape Sand Frog) were observed in these habitats, which was an unusual species richness for localities so close to the sea.

Along with the occurrence of other types of freshwater-associated species this community of amphibians was of special scientific and conservation interest.

Penther's Rain Frog *Breviceps adspersus pentheri*, a fossorial terrestrial frog, was a range-restricted taxon endemic to the Eastern Cape Province and therefore of special conservation significance. It was of probable occurrence on the inland “pan-handle” part of the site¹⁷⁴.

TBC (2026) found two amphibians and two reptiles on site, the Common River Frog, Cape Sand Frog (Figure 8-76), Cape Girdle Lizard, and a Mole Snake (all “LC” species).



Figure 8-76 – Cape Sand Frog. TBC, 2026

Reptiles

There were 62 possible reptile species identified in 2009, as part of the 2011 impact assessment, 50 of which were of probable or confirmed occurrence, with 6 listed as SCC (then). 4 of the 6 SCC have since been downgraded to “LC”. Probably occurring species that were provisionally Red Listed were FitzSimons' Long-tailed Seps *Tetradactylus fitzsimonsi* (Vulnerable) and Tasman's Girdled Lizard *Cordylus tasmani* (Vulnerable). In addition, Péringuey's Coastal Leaf-toed Gecko *Cryptactites peringueyi* (Critically Endangered) was of possible occurrence. This extremely range-restricted Eastern Cape endemic species was known from only two localities, one of which was the Krom River estuary, situated only a few kilometres to the east of the site. If it did occur, it was likely to be associated with vegetation in the splash zone along the coast.

Herald Snake *Crotaphopeltis hotamboeia* and Cape Girdled Lizard *Cordylus cordylus* were found very near to the sea, in association with the coastal wetlands.

None of the anticipated Threatened species was confirmed during the field survey (September 2009). However, one provisionally Red Listed species that was not anticipated was found, namely Elandsberg Dwarf Chameleon *Bradypodion taeniabronchum* (Endangered) (Figure 8-77). This was

a new locality for this species, and it was well removed from other known localities. Its DNA was undergoing analysis because it might have been genetically distinct from other populations of the species. If this was found to be the case, it would further underline the population's conservation importance, and that of the Langefontein wetland Figure 8-77.



Figure 8-77 – Elandsberg dwarf chameleon found at Langefonteinvlei wetland in 2009. Gibb, 2016

TBC (2026) found two reptiles on site, the Cape Girdle Lizard (Figure 8-78), and a Mole Snake (all “LC” species).



Figure 8-78 – The Cape Grindle Lizard. TCB, 2026

Mammals

There were 58 possible mammal species, 44 of which were of probable or confirmed occurrence during the studies in 2009. Three of these species were Red Listed as Threatened or Near Threatened, namely Fynbos Golden Mole *Amblysomus corriae* (Near Threatened), Honey Badger *Mellivora capensis* (Near Threatened and since downgraded to “LC”) and Blue Duiker *Philantomba monticola* (Vulnerable). The Blue Duiker and Honey Badger were almost certain to occur in this area. TBC lists the sable antelope *Hippotragus niger* as another species of SCC expected to occur in this area.

At the coastal part of the site, especially at or near to coastal wetlands, a lot of Cape Clawless Otter *Aonyx capensis* and Marsh Mongoose *Atilax paludinosus*, spoor was noted. The spoor of probably Bushbuck *Tragelaphus scriptus* and Common Duiker *Sylvicapra grimmia* were also noted in the 2009 study (Harrison et al, 2009). These provided further evidence of the ecological importance, as well as the richness and sensitivity of the coastal wetlands¹⁷⁴.

The 2009 study noted that there had been reliable reports of Leopards *Panthera pardus* occurring and possibly breeding on site. While the Leopard was not a Threatened species, its occurrence in coastal environments had become rare. This species was symbolic of the wild, unspoilt nature of the site, and of an ecosystem that was intact and functioning in, or quite close to, its original condition. Leopards could survive, and possibly thrive, in this environment because a number of suitable prey species still occurred in good numbers (confirmed), e.g., Bushpig, Vervet Monkey, Common Duiker, Bushbuck and Red Necked Spurfowl. It was this intactness of the ecosystem which made Thyspunt a site of substantial conservation importance for fauna, especially as it was located at the coast where most ecosystems had been radically altered¹⁷⁴.

TBC recorded ten (10) mammals during their 2025 survey (Figure 8-79). These included the Cape Dune Mole-rat *Bathergus suillus*, the caracal *Caracal caracal*, a Pygmy rodent species, a stripped mouse species, bushbuck *Tragelaphus sylvaticus*, rock hyrax *Procavia capensis*, the cape clawless otter *Aonyx capensis*, the cape grey mongoose *Herpestes pulverulentus*, Nyala *Tragelaphus angasii*, and the cape porcupine *Hystrix africaeaustralis*.

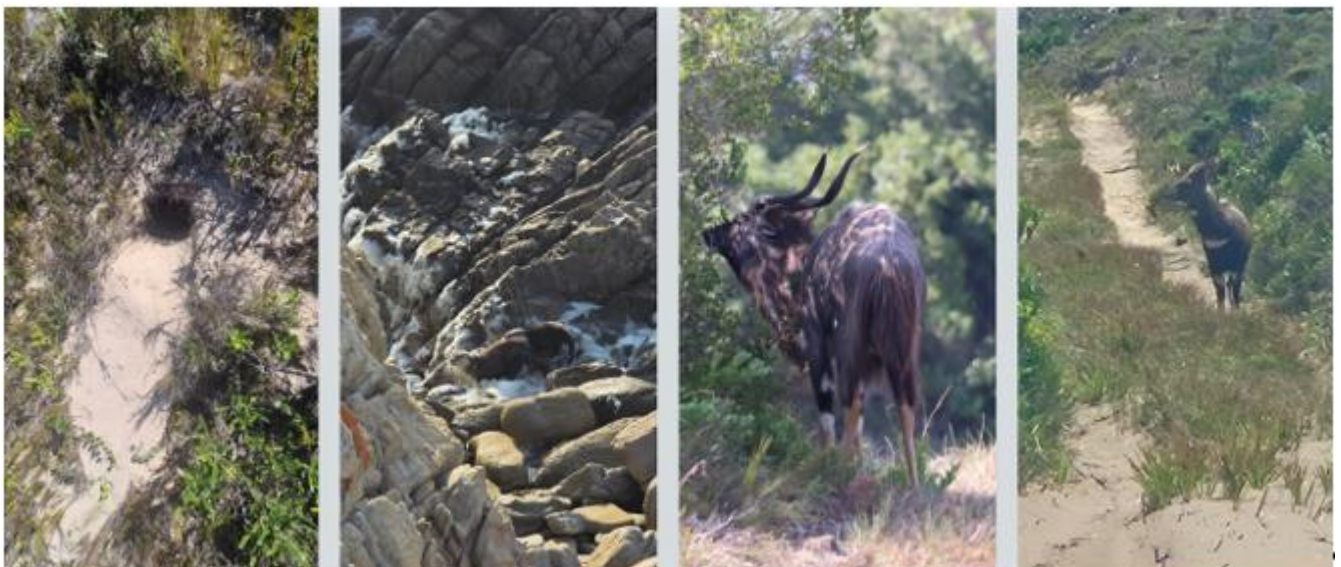


Figure 8-79 – Mammals observed at Thyspunt in 2025. TBC, 2026

8.2.5 INVERTEBRATES

The baseline information in this chapter has been informed by the Animal Theme Scoping Report provided by The Biodiversity Company¹⁸⁷. Invertebrates on the Bantamsklip site were assessed by AfriBugs and Ecocheck in 2010 and 2014 respectively and The Biodiversity Company in 2026.

8.2.5.1 Bantamsklip

Two (2) species of invertebrates of SCC could be expected to occur in the Bantamsklip PAOI, the Mute Winter Katydid (VU) and the Yellow-winged Agile Grasshopper (VU)¹⁸⁵ (Figure 8-80).



Figure 8-80 – SCC potentially present at Bantamsklip (Source: <https://www.inaturalist.org/>)

Twenty ant species were collected during the AfriBugs 2010 surveys, including two potentially undescribed species. Of the fourteen 14 Butterfly species that were recorded, none were local endemics or considered to be SCC.

Mygalomorph spiders, including one baboon spider (a small *Harpactira* species) was found during AfriBugs & Ecochecks 2014 surveys. Numerous specimens of a possibly undescribed trapdoor species of the genus *Spiroctenus* were also found. *Spiroctenus* species tend to have limited distributions and most are known only from single localities (EcoChecks as cited by TBC, 2026).

The Mute Winter Katydid *Brinckiella aptera* was identified in the 2025 study. Of the four species of meadow katydids found on site, two are listed as Least Concern, one as Vulnerable and one—*C. (M.) vaginalis*—as Endangered (Figure 8-81).

¹⁸⁷ Animal Theme Scoping report. TBC, 2026

One specimen of an undescribed species of *Spiroctenus*, previously recorded at Bantamsklip in 2008, 2010, 2012 and 2013 was identified in the 2026 survey together with five specimens of *Mantophasmatodea* (Heelwalkers) (Figure 8-82).



Figure 8-81 – *Vaginalis* species found on site. TBC, 2026



Figure 8-82 – *Mantophasmatodea* found in TBC 2025 study. TBC, 2026

8.2.5.2 Thyspunt

According to the DFFE screening tool, one (1) species of currently recognised invertebrate SCC could be expected to occur in the Thyspunt PAOI, the Yellow-winged Agile Grasshopper *Aneuryphymus montanus*. Two invertebrate ant species of potential conservation significance were observed during the 2025 field survey, the *Diplomorium longipenne* and *Doratogonus* (Giant millipedes) (Figure 8-83).

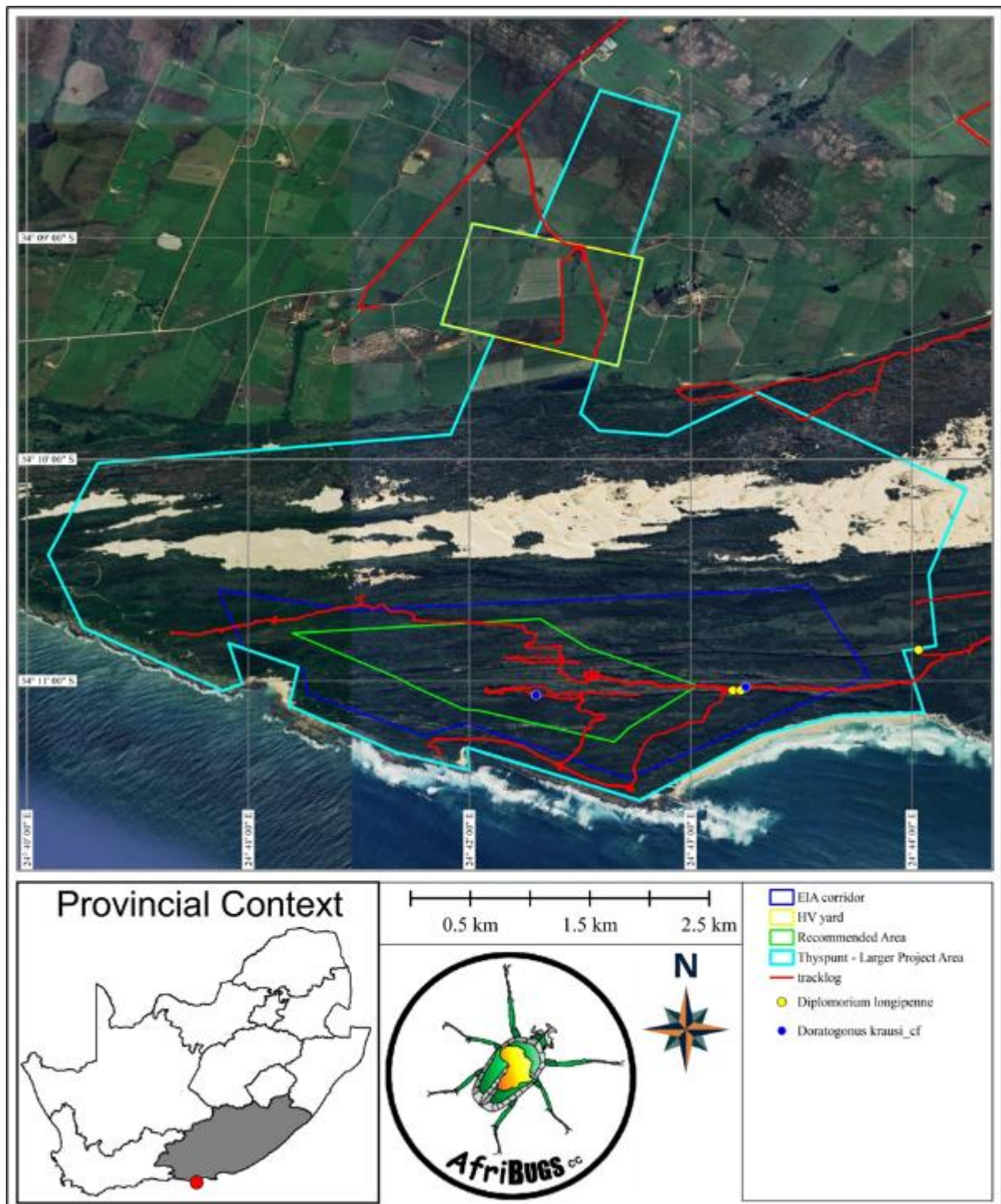


Figure 8-83 – The location of the SCC found at Thyspunt in 2026.TBC, 2026

Ant species

Twenty-one species were collected in the 2009 study (Harrison et al, 2009), with an estimated diversity of approximately 26 species. Two undescribed ant species, one extremely rarely encountered ant species and one probably undescribed species were identified at Thyspunt. These were:

- *Tetramorium* sp. (an undescribed species related to *T. emeryi* and *T. erectum*), found on Unvegetated Dunes
- *Monomorium* sp. (an undescribed species related to *M. disertum*);
- *Diplomorium longipenne* (a monotypic genus that appears to be endemic to the Western / Eastern Cape border region of South Africa. It has to date only been recorded from George, Willowmore and Gqeberha.
- *Camponotus* sp. (A probably undescribed arboreal species). Specimens of this species, which was first found in natural Tall Thicket / Forest within the potential NPS footprint area and in similar habitat well to the west of the footprint area, were taken to the South African Museum in Cape Town in January 2010. No matching specimens could be found in this collection, although the species appears closely related to two un-named species from Tanzania. It is very likely that the Thyspunt specimens represent an undescribed species, but this remains to be confirmed.

The *D. longipenne*, is confirmed for only three localities, including Thyspunt, where it was first recorded in 2008 (AfriBugs 2010). Although not red-listed at present, the species is currently undergoing an IUCN Red List assessment and has a high probability of being assigned a threat status of vulnerable or higher.

Two samples of this species were collected during the 2008 survey of the Thyspunt site, and searches to confirm its continued presence were a secondary focus of the 2025 survey.

Diplomorium longipenne was confirmed to be present both near the previously recorded locality and at a second point within the Thyspunt study area, with several samples being collected at each location¹⁰.



Figure 8-84 – *Diplomorium longipenne* specimen collected at Thyspunt in 2008. The Biodiversity Company, 2026

Millipedes

Three specimens (two males and one female) of a species of *Doratogonus* (Giant millipedes) were collected along the access road route and within the previously recommended nuclear plant area. Thyspunt is 580 km from nearest recorded locality for this species, and at approximately 1000 m lower altitude than the lowest known record, so the identity of the specimens needs further investigation. If the specimens are confirmed to be *D. krausi*, then the Thyspunt records, while of biogeographic interest, will not represent conservation-significant data, but if the specimens prove to be distinct from *D. krausi*, they will then almost certainly represent an undescribed species and be should be considered as High Sensitivity in the context of the present EIA ¹⁰.

Butterflies

The summed probable total butterfly species count for Thyspunt in the 2009 study (Harrison et al, 2009 as cited by TBC, 2009) was high at 42 but the Red List species probability of 0.01 was very low. A total of 22 species were surveyed, of which none were locally endemic, three are regionally endemic and 3 are endemic to South Africa. Thyspunt had a high overall butterfly diversity and a large number of rare and/or endemic species¹⁷⁴.

Other invertebrates

A summary of the other invertebrates that have been observed on this site, besides ants and butterflies, is listed below:

- Velvet worms (*Onchyophora*): one specimen of velvet worm was found at the edge of a field on the inland (agriculturally transformed) portion of the Thyspunt site.
- Spiders ((Arachnida: Araneae: *Mygalomorphae*): none found.
- Scorpions (Arachnida: *Scorpiones*): none found.
- Soldier flies (*Mydidae*): none found.
- Heelwalkers (*Mantophasmatodea*): none found.
- Monkey beetles (*Hopliini*): none found.
- Millipedes (*Myriapoda*): 3 species found.
- Jewel beetles (*Buprestidae*): none found.
- Spoonwing lacewings (*Nemopteridae*): none found.
- Horseflies (*Tabanidae*): none found.

It is unlikely that the Thyspunt study site will host any listed Red Data invertebrate of the Eastern Cape Province (Figure 8-85).

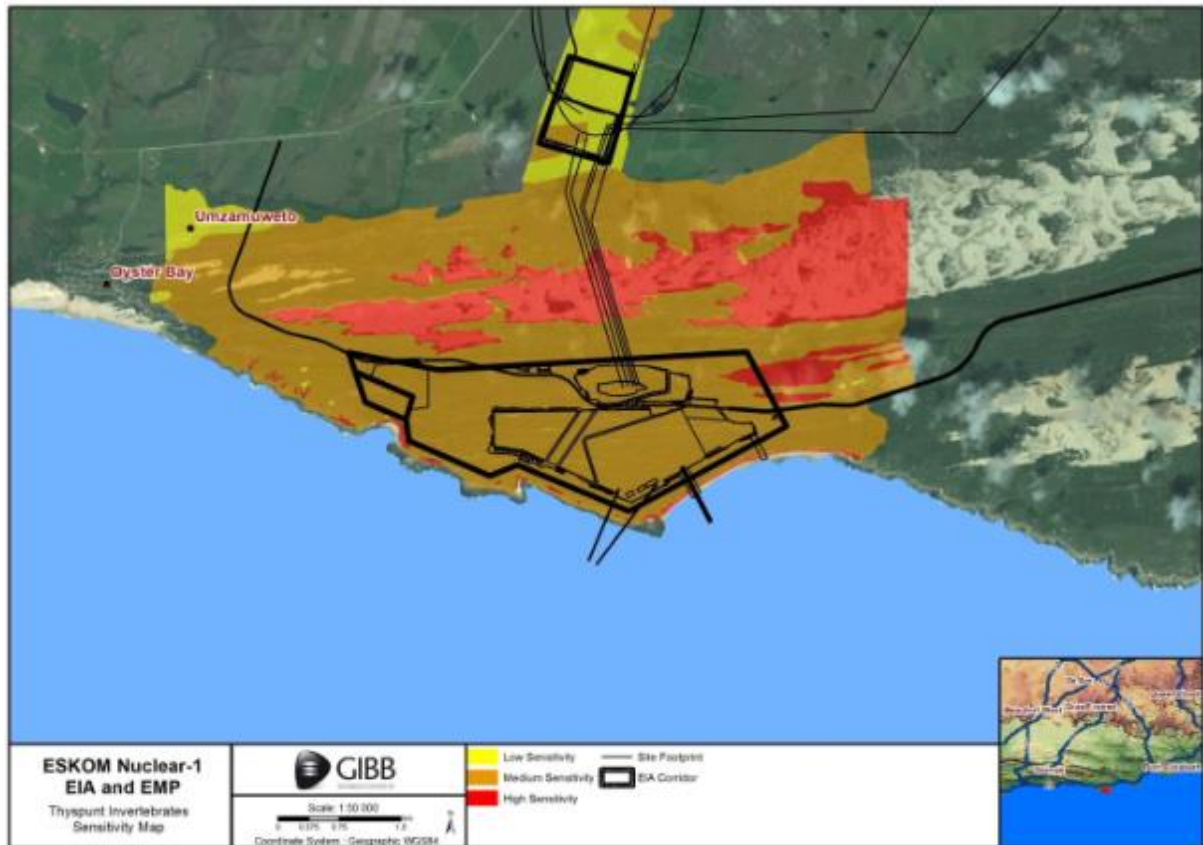


Figure 8-85 – Thyspunt invertebrate Sensitivity Map. Gibb, 2016

8.2.6 AVIFAUNA – BIRDS

The information in this chapter has been provided through the Avifauna Scoping Assessment conducted by The Biodiversity Company (TBC) in 2026 in partnership with Anchor Environmental.¹⁸⁸

8.2.6.1 Bantamsklip

The Bantamsklip site is located in a very sensitive area from an ecological sensitivity perspective. The site's Ecosystem Threat status contains areas that are considered Least concern (LC), Endangered (EN) and Critical (CR) Ecosystems¹⁸⁸. The site is located within an Ecosystem Protection level that is "Well Protected (WP), Moderately Protected (MP), and Poorly Protected (PP)". The site and development area fall across various biodiversity priority areas including CBA1 (In natural condition) and Protected Areas (PA) areas.

The site overlaps with two Protected areas, being the Agulhas National Park, the Groot Hagelkraal Private Nature Reserve. The PAOI overlaps with NPAES priority focus areas. TBC explains that a new set of KBA specific to South Africa has been identified using the Global Standard for the

¹⁸⁸ Avifauna Scoping Assessments for the Proposed Nuclear Power Plant Project

Identification of KBAs version 1.2 (IUCN 2016), applied to South African species and ecosystems. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species. The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. The proposed site overlaps with the Agulhus Coast KBA.

The north western part of the site overlaps with a Critical CR SAIIE wetland, associated with the Haelkraal River system. This same wetland system is rated as a priority NFEPA wetland.

No Coordinated Waterbird Counts (CWAC) have been identified on the site itself, however 38 species have been observed at a CWAC (including 12 SCC), 3.5km east of the proposed site. Similarly, the site does not have any species previously identified from Coordinated Avifaunal Roadcount (CAR) routes¹⁸⁸.

Expected Species

TBC notes that the SABAP2 and CWAC data indicate that 228 avifauna species are expected to be found in this area and surrounds. Of these, 45 are considered SCC. Of these, 15 SCCs have a high likelihood of occurrence, with 11 of these species being observed during the field surveys, including the African Marsh Harrier (*Circus ranivorus*), Black Harrier (*Circus maurus*), Black-winged Kite (*Elanus caeruleus*), Blue Crane (*Anthropoides paradiseus*), Cape Cormorant (*Phalacrocorax capensis*), Crowned Cormorant (*Microcarbo coronatus*), Denham's Bustard (*Neotis denhami*), Fynbos Buttonquail (*Turnix hottentottus*), Hartlaub's Gull (*Chroicocephalus hartlaubi*), Kittlitz's Plover (*Charadrius pecuarius*), and Ruddy Turnstone (*Arenaria interpres*)¹⁸⁸.

Avifaunal Habitat

Three habitat types were delineated within the Project Area, namely Fynbos, Transformed, and Water Resources. The fynbos Site Ecological Importance (SEI) is considered to have "Medium EI, the transformed habitat a "Low" SEI and the Water Resources habitat, a "High" SEI.

DFFE Screening Tool Sensitivity

The DFFE Screening Tool highlighted this site as having "High" Sensitivity. The Avifaunal Specialist has validated the "High" sensitivity rating for the habitat areas that are Water Resource. The habitat under fynbos and transformed land is considered to be of "Medium" and "Very low" sensitivity (Figure 8-86).

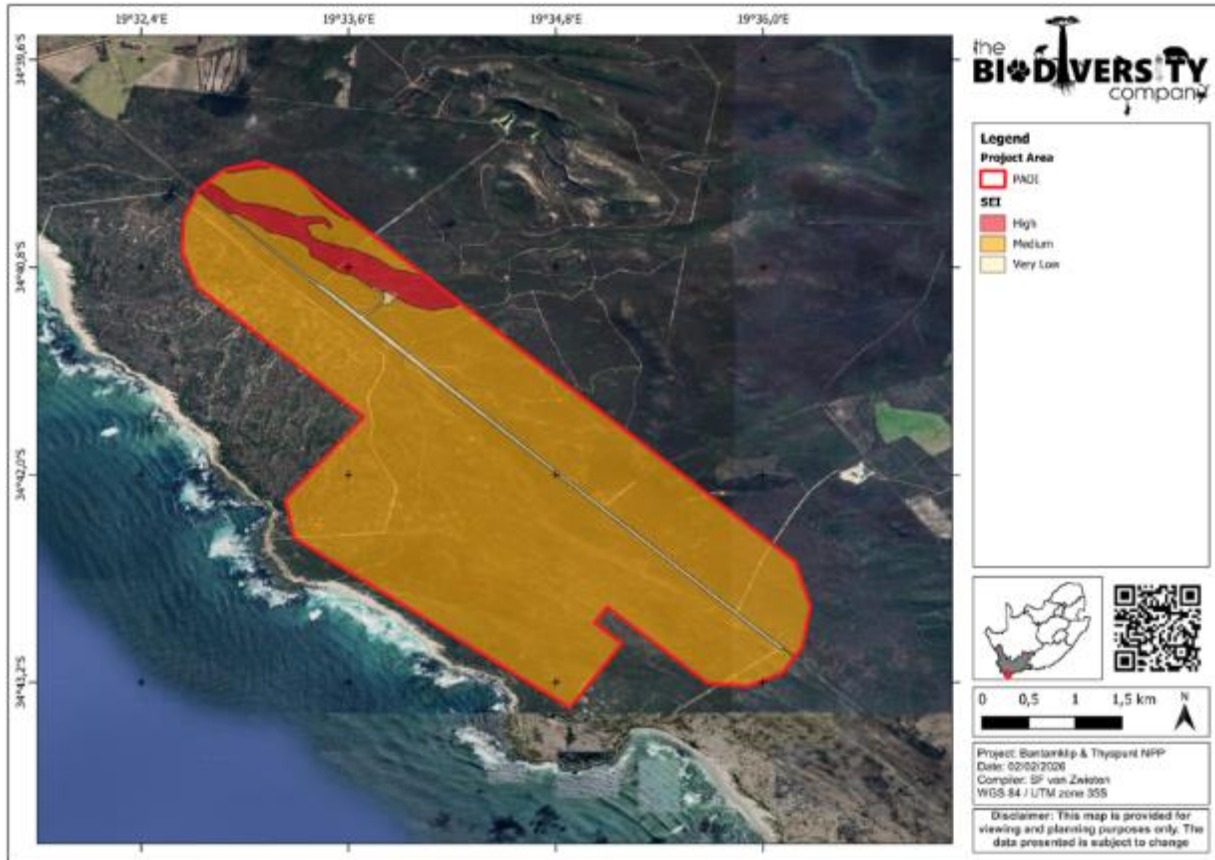


Figure 8-86 – Site Ecological Importance for the PAOI. TBC, 2026

8.2.6.2 Thyspunt

The Thyspunt site is also considered a sensitive site in terms of avifaunal presence and protection. The site has an Ecosystem Threat status of Least concern (LC), with a small section that overlaps with an Endangered Ecosystem Threat status in the western part of the site. The majority of the site is located within Poorly Protected (PP) areas with a small area to the north and far western side of the site falling within a Well Protected (WP) area.

According to the Conservation Plan, the PAOI and development area fall across various biodiversity priority areas including CBA1 (in natural condition), CBA2 (Degraded/secondary vegetation), ESA1 (Natural/near natural/moderately degraded conditions), ESA2 (severely degraded/no natural cover remaining), and borders a Protected Area (PA) on the Eastern side of the proposed location. This PA is the Rebelsrus Private Nature Reserve. The site is located within 5 km of 11 other SACAD areas, being Cape St. Francis Provincial Nature Reserve, Eastcot Private Nature Reserve, Franscois and Annelle Marits Private Nature Reserve, Irma Booysen Flora Reserve, Kromme Geelhout Protected Environment, Kromme River Mouth Private Nature Reserve, Mosterthoek Nature Reserve, Rebels Nature Reserve, Sand River Private Nature Reserve, St Francis Sands Nature Reserve, Thula Moya Nature Reserve¹⁸⁸.

The site does not overlap with any NPAES priority focus areas. The site development area and the PAOI overlap with the Graden Route KBA and with CR and EN wetlands associated with the dune fields. These wetlands from a desktop level are considered priority and non-priority NFEPA wetlands.

The closest CWAC to the site, the Krom River Mouth, is ~4,3 km northeast of the PAOI. In total 88 species were observed at this CWAC, including 27 SCCs. There is a CAR route within proximity (not overlapping) to this site. In total 21 species have been observed on these CAR counts, including 9 SCCs. SABAP2, CAR, and CWAC data indicates that 364 avifauna species are expected for the PAOI and surrounds. Of these, 71 are considered SCC. Of these, 31 SCCs have a high likelihood of occurrence, with 11 of these species being observed during the field surveys, the African Darter (*Anhinga rufa*), African Marsh Harrier (*Circus ranivorus*), Black Harrier (*Circus maurus*), Black-crowned Night Heron (*Nycticorax nycticorax*), Black-winged Kite (*Elanus caeruleus*), Cape Cormorant (*Phalacrocorax capensis*), Cape Gannet (*Morus capensis*), Denham's Bustard (*Neotis denhami*), Knysna Woodpecker (*Campethera notata*), Ruddy Turnstone (*Arenaria interpres*), and Yellow-billed Duck (*Anas undulata*). Additionally, the Fynbos Buttonquail (*Turnix hottentottus*), was observed during the field surveys that was not indicated in the SABAP2 data¹⁸⁸.

Similarly the 2009 assessment noted that there were 206 species of possible occurrence, 61 of which were confirmed during the 2009 site assessment. There was a coastal locality which appeared to be important as a roost site for terns of a variety of species. This was at the head of the sheltered bay just to the west of Thyspunt itself (Figure 8-87). It was also along the shoreline of this bay that the greatest concentration of coastal seeps occurred. The proximity of marine and freshwater ecosystems in this area was believed to be the result, in part, of the sheltered nature of the bay which protected the coastal seeps from saltwater invasion by wave action. The sheltered nature of the bay also created a suitable roost site for seabirds. The specialist (reference) suggested that this bay should have been viewed as a sensitive locality requiring the highest level of protection¹⁷⁴.

The species that that may be at risk of collision, electrocution or habitat loss as a result of the proposed activity have been listed in Table 8-14.

Table 8-14 – Priority Species at risk of collision. TBC, 2026

COMMON NAME	SCIENTIFIC NAME	COLLISION	ELECTROCUTION	DISTURBANCE/HABITAT LOSS
African Marsh Harrier	<i>Circus ranivorus</i>	X	X	X
African Oystercatcher	<i>Haematopus moquini</i>	X		X
African Sacred Ibis	<i>Threskiornis aethiopicus</i>		X	
Black Harrier	<i>Circus maurus</i>	X	X	X
Black Sparrowhawk	<i>Accipiter melanoleucus</i>	X	X	
Black-headed Heron	<i>Ardea melanocephala</i>	X	X	
Black-winged Kite	<i>Elanus caeruleus</i>	X	X	
Blue Crane	<i>Anthropoides paradiseus</i>	X		X
Cape Cormorant	<i>Phalacrocorax capensis</i>	X	X	X
Common Buzzard	<i>Buteo buteo</i>	X	X	
Crowned Cormorant	<i>Microcarbo coronatus</i>	X	X	X

COMMON NAME	SCIENTIFIC NAME	COLLISION	ELECTROCUTION	DISTURBANCE/HABITAT LOSS
Denham's Bustard	<i>Neotis denhami</i>	X		X
Eurasian Whimbrel	<i>Numenius phaeopus</i>	X		
Fynbos Buttonquail	<i>Turnix hottentottus</i>	X		X
Greater Crested Tern	<i>Thalasseus bergii</i>	X		
Jackal Buzzard	<i>Buteo rufofuscus</i>	X	X	
Kittlitz's Plover	<i>Charadrius pecuarius</i>	X		
Reed Cormorant	<i>Microcarbo africanus</i>	X	X	
Ruddy Turnstone	<i>Arenaria interpres</i>	X		
Sandwich Tern	<i>Thalasseus sandvicensis</i>	X		
Spur-winged Goose	<i>Plectropterus gambensis</i>	X	X	
White-breasted Cormorant	<i>Phalacrocorax lucidus</i>	X	X	

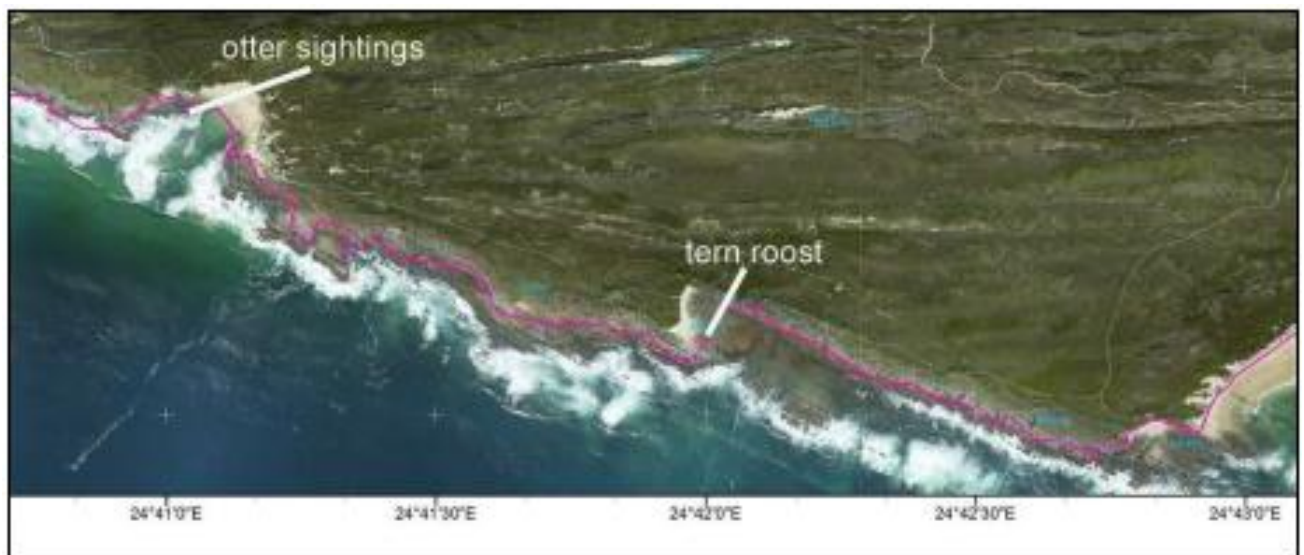


Figure 8-87 – Key Avifauna locations. Gibb, 2016

Avifaunal Habitat

Five (5) habitats were delineated at the Thyspunt site and given EI ratings. These included the Disturbed Grassy Fynbos (medium SEI), pasture fields (low SEI), seashore vegetation (medium SEI), strandveld (medium SEI), water resource (high SEI), and cormorant breeding habitat.

DFFE Screening Tool Sensitivity

The DFFE screening tool afforded the project area as having “High” Sensitivity. The avifauna specialist validated this sensitivity rating only for the water resources habitat on site. This has been depicted in TBC’s SEI importance map in Figure 8-88.

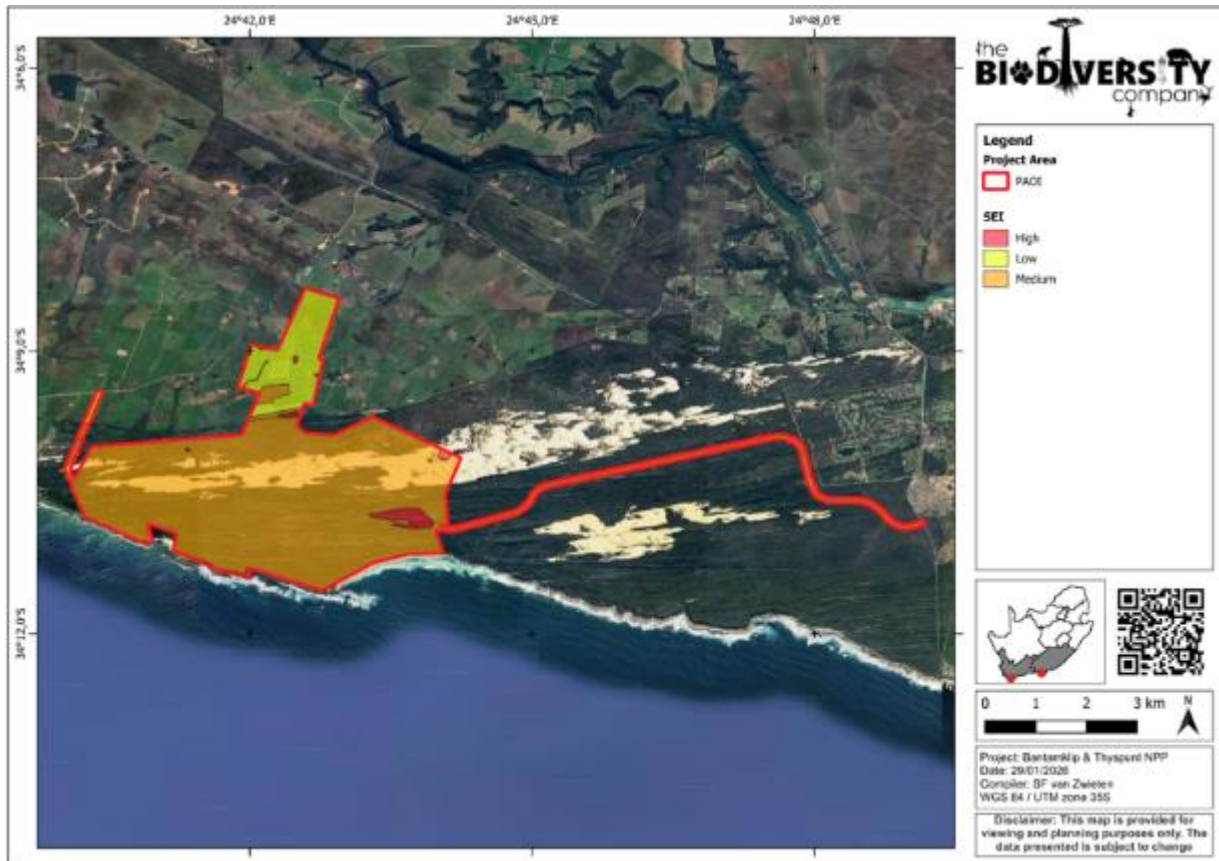


Figure 8-88 – Site Ecological Importance – Thyspunt. TBC, 2026

Sensitive areas

The avifaunal sensitivity was mapped as part of Gibb's 2016 Assessment. The mapping Figure 8-87 was based primarily on (a) scarce habitats important to the maintenance of faunal diversity, (b) areas important for ecological corridors, and (c) areas occupied by particularly sensitive species. In the case of Thyspunt, the areas identified as having high faunal sensitivity were:

- All wetlands, with a 100 m buffer. Wetlands had a central role in maintaining faunal diversity and faunal populations. Buffers were essential to provide semi-aquatic species with terrestrial habitat and corridors of access for terrestrial species. The Langefontein wetland was home to the Elandsberg Dwarf Chameleon (Endangered). The coastal seeps represented a rare and unusual ecosystem.
- The coastal corridor (200 m above the then current high-water line; Prestedge et al. 2009). A coastal corridor provided access to coastal resources and allowed movement along the coast.
- Most of the central mobile-dune field. The ecology of the dune field was highly dynamic and easily disrupted by alteration of patterns of sand movement, therefore obstructions needed to be avoided. Areas containing wetlands had been indicated as having high sensitivity, otherwise medium.
- All areas containing forest (defined mostly as "thicket" by Low 2008). Many species were obligate residents of thicket and forest, and many more regularly used the resources found in these habitats, therefore they were essential in the maintenance of faunal diversity on site. The resolution of types of thicket (viz., strandveld thicket, dune forest, alien thickets) was not possible

(Barrie Low pers. comm.), so parts of the thicket areas would, in fact, have been of medium sensitivity.

- The inland area covered by Tsitsikamma Sandstone Fynbos. This was classified as a Vulnerable vegetation type (Mucina and Rutherford 2006) and, together with its rocky substrate, was found to be a rich habitat for reptiles and a probable breeding habitat for Denham's Bustard (Vulnerable) and Blue Crane (Vulnerable) and foraging habitat for Secretarybird (Near Threatened).
- All other natural areas were of medium sensitivity.
- Areas transformed by agriculture (on the inland portion) were of low sensitivity.

8.2.7 MARINE BIOLOGY

The baseline information for this section has been informed by Anchor Environmental's Marine Ecology Impact Assessment¹⁸⁹.

8.2.7.1 Bantamsklip

Bantamsklip is less affected by the Agulhas Current (than Thyspunt), which flows further offshore along the edge of the Agulhas Bank, while coastal upwelling processes influence local waters and currents, shaping temperature, nutrient distribution, and oxygen availability. The Bantamsklip site is characterized by high exposure, with rocky shores and small embayed sandy beaches. Offshore, the seabed is predominantly sandstone, interspersed with local gullies and reefs.

Coastal habitats include exposed rocky shores, mixed sandy regions, and kelp forests primarily composed of *Ecklonia maxima* and *Laminaria pallida*. These kelp forests provide complex three-dimensional structures that support reef fish, invertebrates, and commercially significant species such as abalone (*Haliotis midae*) and rock lobster (*Jasus lalandii*). Rocky intertidal zones, typical of the western and southern Cape, feature high-shore algae (*P. capensis*), gastropods (*A. africana*), mid-shore endemic algae (*Brassicophycus sisymbrioides*), and low-shore coralline algae, Ulva, limpets, and topshells. The harvesting of giant periwinkles, abalone, and rock lobster occurs within this region.

The sandy pocket beaches are generally small and isolated, exhibiting limited sediment exchange. Dominant fauna includes scavenger *B. digitalis* (plough shells), amphipods (such as *Urothoe* and *Corophiidae*), polychaete worms, and surf mysids. The accumulation of kelp wrack provides organic matter, supporting detritivores and higher predators, including shorebirds and surf-zone fish. Additionally, these surf zones act as nurseries and feeding areas for coastal fish, paralleling those observed at Thyspunt¹⁸⁹.

Fisheries

Bantamsklip supports commercial linefishing (targeting species like red roman, Cape bream, yellowtail, geelbek, and silver kob), small pelagic fishing (mainly sardine and anchovy via purse seine vessels from Gansbaai and St Helena Bay), and kelp harvesting under regulated concessions.

¹⁸⁹ Marine Ecology Impact Assessment for Bantamsklip and Thyspunt. Anchor Environmental, 2026

The site is a key access point, actively used by both commercial and small-scale fishers (including those harvesting rock lobster, abalone, and invertebrates). Kelp beds support abalone aquaculture and industrial uses, while also providing habitat for marine life. Recreational fishing for linefish and rock lobster overlaps with these activities along the coast¹⁸⁹.

Site Sensitivity

Bantamsklip provides clear evidence of persistent anthropogenic pressures along the coastal zone. Widespread vehicular tracks across beaches and foredunes indicate frequent access by recreational fishers, poachers, and kelp harvesters, resulting in localized erosion and degradation of dune vegetation. Illegal harvesting of invertebrates was evident through observation of numerous discarded abalone shells, crayfish tails, and turbo shells. This confirmed ongoing exploitation within the area¹⁸⁹.

Kelp harvesting, particularly of *Ecklonia maxima*, was observed along the northern beach, where piles of drift kelp left to dry on the fynbos fringe smother underlying vegetation which could disrupt local invertebrate communities reliant on this vegetation. Offshore habitats encompass Vulnerable kelp forests, while to the south, Agulhas Reflective Sandy Shore habitats are classified as Endangered; although direct assessments were not conducted during the visit, these habitats are known to be sensitive to disturbance. Despite these pressures, the site does not meet the criteria for Critical Habitat, and natural processes remain largely functional, though altered. Implementation of mitigation measures and stringent management controls will be crucial to prevent further habitat degradation here, and to guide development towards less sensitive areas, avoiding heavily impacted dunes, nearshore kelp zones, and vulnerable offshore habitats¹⁸⁹.

8.2.7.2 Thyspunt

The oceanography of Thyspunt is shaped by the warm Agulhas Current, which mixes with cooler inshore currents, affecting water temperature, nutrients, and oxygen and enabling species migrations like sardines. The coastline features rocky shores, platforms, headlands, sandy bays, and vegetated dunes, with intertidal and subtidal habitats supporting sand movement. Offshore seabeds are mostly consolidated sediments, and Thyspunt acts as an isolated sediment cell with little sand transport except during storms.

Coastal habitats here, include exposed rocky and sandy shores, stromatolite areas, and shelf sediments, supporting diverse communities. Rocky intertidal zones display southern Cape zonation, with characteristic algae, gastropods, barnacles, mussels, starfish, and reef worms. Giant periwinkles (*Turbo sarmaticus*) are harvested locally. Wide, coarse sandy beaches host low diversity but are dominated by scavenger snails, sand mussels, surf mysids, meiofauna, fish, and shorebirds, serving as nutrient filters and nursery areas for predatory fish, including IUCN-listed species.

Subtidal reefs support varied fish and invertebrates, while kelp and rocky habitats link nearshore and offshore ecosystems. Fish communities feature dusky kob, steenbras, galjoen, garrick, elf, yellowtail, and seasonal pelagics. These productive habitats are in need of sustainable management due to overexploitation risks¹⁸⁹.

Fisheries

Several commercial fisheries operate near Thyspunt, focusing mainly on squid, linefish, and inshore demersal trawl sectors. The chokka squid (*Loligo reynaudii*) jig fishery spans from Plettenberg Bay to Gqeberha, with intense fishing activity right next to the Thyspunt site. Of all fisheries, this one

raises the most concern regarding potential impacts on local fishing practices (compared to the Bantamsklip site)¹⁸⁹. Adult squid are caught in spawning groups at depths of 20–120 meters, with annual catches typically between 6,000 and 7,000 tonnes. Since spawning squid are sensitive to increased turbidity and sediment, coastal development could significantly affect them and in turn the squid fishing industry in this area.

The inshore demersal trawl fishery primarily targets shallow-water hake (*Merluccius capensis*) between Cape Agulhas and the Great Kei River, operating mostly beyond the 110-meter depth mark. Trawling is uncommon near the Thyspunt shoreline but increases further offshore along the continental shelf. This fishery is important to South Africa's economy and provides employment, though its direct overlap with Thyspunt's nearshore waters is limited. It also produces bycatch such as monkfish, kingklip, snoek, and panga.

Commercial linefishing is moderate to frequent near Thyspunt, with vessels aiming for reef- and demersal-associated species like geelbek, dusky kob, and yellowtail. Access points around Cape St Francis facilitate regular fishing activity, making the area a key ground for line fishing. Small-scale fishers work in both estuarine and marine environments, mainly harvesting intertidal invertebrates and fish. There is some overlap with larger commercial squid and line fish zones. Resource sharing is managed sustainably through small-scale allocations within the Total Allowable Catch (TAC) framework for squid and line fish¹⁸⁹.

Small pelagic purse-seine activity in the Thyspunt area is minimal, mostly concentrated around St Francis Bay. South Coast Rock Lobster fishing operations occur farther offshore, about 30–40 km to the south, resulting in little direct interaction with Thyspunt's nearshore zone. Recreational fishing is prevalent throughout the inshore region, targeting many of the same species as commercial and small-scale fishers and could be affected by local development¹⁸⁹.

Site Sensitivity

Thyspunt lies within the Agulhas ecoregion, where coastal habitats range from least threatened to vulnerable and are moderately protected (Sink et al. 2012). Though surveys (in 2012) found no locally endemic rocky or sandy shore species. There were no sites of special biological significance in the area, though historical fish traps exist nearby¹⁷⁴.

Restricted access has limited the local marine utilization at Thyspunt. A commercial chokka squid fishery (*Loligo vulgaris*) operates offshore, and since the mid-1980s, a jigging fishery for *Loligo Reynaudii* targets spawning aggregations between Plettenberg Bay and Port Alfred. Recreational angling is widespread along the Eastern Cape coast, including Cape St. Francis, while demersal and pelagic fisheries operate offshore from Thyspunt but outside the planned power station's impact zone¹⁷⁴.

The Thyspunt site is distinguished by its largely unspoiled coastal environment, particularly within the eastern embayment where natural habitat conditions prevail, verified during a site inspection by the marine ecologist. Field observations revealed no apparent evidence of human activity along the shoreline. The nearshore area primarily comprises dynamic sandy beaches classified as Agulhas Intermediate Sandy Shore, a habitat type nationally considered to be of Least Concern, with limited areas of Agulhas Stromatolite Mixed Shore, which is classified as Vulnerable and covers only 8.45 km² nationally. Although these habitats are not designated as Critical Habitat according to IFC criteria, the eastern CBA Natural zone constitutes a sensitive area where activities such as seawater abstraction or disposal are restricted and require thorough, site-specific evaluation¹⁸⁹.

Overall, the site maintains intact natural processes and habitats, suggesting that development should avoid direct disturbance to these sensitive zones, with construction prioritised in less vulnerable sandy shore areas. Comparative monitoring data from developments like Koeberg NPP demonstrate that these habitats can/ may remain resilient to carefully managed human activities, provided robust mitigation measures are implemented¹⁸⁹.

8.3 SOCIAL AND ECONOMIC ENVIRONMENT

8.3.1 SOCIO-ECONOMIC ENVIRONMENT

The Project could be located in either the Eastern Cape (Thyspunt, Kouga LM, Sarah Baartman District Municipality) or the Western Cape (Bantamsklip, Overstrand Local Municipality, Overberg District Municipality). The baseline information has been sourced from both Gibb's 2013 EIA¹⁷⁴ and WSP's SIA¹⁹⁰.

8.3.1.1 Bantamsklip

Located in the southernmost part of the country (Figure 8-89), the Western Cape is bordered by the Northern Cape and Eastern Cape provinces and covers an area of 129,462 km². The capital city of the province is Cape Town. The Western Cape is a vital producer of grapes and wheat, contributing to the country's GDP through agriculture and wineries.

The province has a population of 6,279,730 and is the fourth-largest province in the country.

The proposed Bantamsklip NPP site is located within the Overstrand Local Municipality, which stretches along the south-western coast of the Overberg District in the Western Cape, between Cape Town and the Cape Agulhas area. The municipality encompasses coastal settlements such as Hermanus, Gansbaai and Kleinmond, and is characterised by a mix of urban, peri-urban, and rural communities within a predominantly coastal landscape.

Economy

The Western Cape has the third-highest contribution to the GDP by a province, falling behind only Gauteng and KwaZulu-Natal (Statistics South Africa, 2022). The province plays a very important role, contributing more than 10%, significantly higher than the rest of the provinces to the national GDP.

Economic Growth

Growth in the Eastern Cape is driven by its diverse sectors, including real estate, fisheries, finance, tourism, retail, and agriculture (Statistics South Africa, 2022). Economic activities such as tourism, viticulture, fruit production, biodiversity conservation and fishing are at an advantage in the province. The province is home to the Cape Fold Belt mountains, Little and Great Karoo, coastal plains and diverse terrains (Western Cape Province, 2025)¹⁹⁰.

¹⁹⁰ Socio-Economic Impact Assessment, Bantamsklip and Thyspunt. WSP, 2026



Figure 8-89 – The Western Cape Province. WSP, 2026

Overberg District Municipality

A category C. district in the Western Cape province and is home to the Theewaterskloof, Swellendam, Overstrand and Cape Agulhas local municipalities. According to the 2023 Socio-Economic Profile prepared by the Western Cape Provincial Treasury, Overstrand has an estimated population of approximately 132,495 residents living in around 59,980 households, with a relatively balanced gender distribution (51.4% female; 48.6% male). The age structure reflects a significant working-age population (~66%) with a notable proportion of older adults (~15%), consistent with the municipality's profile as both a residential and retirement destination.

The local economy is service-oriented, with the largest contributions to GDP from finance, insurance, real estate, and business services, followed by wholesale and retail trade (including tourism) and manufacturing. Despite this economic activity, socio-economic vulnerability persists, with the latest profile indicating an unemployment rate of around 21.5% and continued challenges related to poverty and inequality in parts of the municipality¹⁸².

The Overberg District Municipality is dominated by formal housing structures, making up to 75.7% of the district's dwelling types.

Migration

Knowing the percentage distribution of immigrants in the Overberg District Municipality by country of origin is important as it provides an idea of how diverse the people in the district are. The district is highly diverse, with people from over 20 countries residing there. Zimbabwe is the country with the

highest number of immigrants residing in the Overberg District Municipality, and accounts for 43.54% of the total. Followed by Malawi, with a population share of 15.77% and the United Kingdom with 9.57% (Statistics South Africa, 2022 as cited by WSP, 2026).

Employment

In the 2024/2024 financial year, the number of employed people in the district increased by 2.9%, an increase from previous years. The unemployment rate dropped from 16.2% in 2021 to 14.9% in 2022, with the tertiary and primary sectors contributing the highest and lowest, respectively (Overberg DM, 2025) as cited by WSP, 2026.

Crime

Contact crimes and sexual offences have shown an increase in this district over the last few years, where there has been decreases in subcategories of aggravated robbery crimes such as carjacking, robbery at non-residential premises, robbery of cash-in-transit, bank robbery and truck hijacking (South African Police Service, 2025 as cited by WSP, 2026).

The Overstrand Local Municipality

A category B local Municipality found within the Overberg District. It only covers 14% of the district's total land, making it the smallest local municipality. Stretching approximately 1,708 km² from Quinn Point in the east to Rooiels in the west, the municipality is located in the western part of the Overberg district and shares a border with the City of Cape Town municipality. It covers areas such as Greater Hermanus, Hangklip-Kleinmond, Stanford, and Greater Gansbaai, and has 14 wards. The municipality has five Blue Flag beaches, popular with international and domestic holiday tourists

Bantamsklip is situated within the Overstrand municipality, in the coastal region adjacent to the Indian Ocean and located less than 10 kilometers from the shoreline. The area is in proximity to several agricultural holdings, including Hagelkraal 318, Buffel Jagt 309 and 311, and Luipaards Poort¹⁹⁰.

Population

Overstrand is the second most populous in the district and it has continued to grow in recent years. The population of Overstrand LM has been increasing since 2001. In 2011, the growth rate from the previous census was 48.3%, followed by 16.2% in the 2016 community survey and 41.9% in 2021.

Language

The three most spoken languages in the municipality are Afrikaans (47.5%), IsiXhosa (31.7%), and English (15.4%) (Statistics South Africa, 2022 as cited by WSP, 2026).

Poverty

Poverty is a lack of the necessary resources, such as money and adequate shelter, to provide a basic standard of living. In Overstrand LM, poverty leads to malnutrition, low life expectancy, crime vulnerability, food insecurity, and poor livelihoods. In 2016, 60% of workers could not afford enough monthly food; by 2019, this rose to 60.2%. For every 1,000 laborers, 602 lack sufficient food¹⁹⁰.

Municipal service infrastructure

Water use and demand has increase in recent years in this municipality, to both household and businesses. The proportion of people with access to water in their dwellings was 1.8 percentage points lower in 2011 than in 2016. In 2022, it further increased by 10% from the 2016 proportion

record. Implying that more people have taps inside their homes since 2011 (Statistics South Africa, 2011; Statistics South Africa, 2016; Statistics South Africa, 2022 as cited by WSP, 2026).

Municipal water supply has improved over recent years, with 6.4 % in 2011 to 1% in 2022 of the population lacking flushing toilets (Municipalities of South Africa, 2022, as cited by WSP, 2026).

Electrical use

In the 2011 census, electricity was the main energy source used for cooking in the municipality. By 2022, however, gas had become the preferred option. This shift is largely due to increased electricity costs and frequent load shedding in recent years.

Political climate

The Democratic Alliance dominated the polls in the 2024 local elections of Overstrand LM. The party had a 63.7% share of the votes. The ANC had almost four times fewer votes than the DA, a share of only 16.9% (Independent Electoral Commission, 2024 as cited by WSP, 2026¹⁹⁰

Economy

Economic contribution is the amount an area contributes to a country's revenue. The Overstrand Municipality competes with the Overberg District on GDP per capita. (Overberg District Municipality, 2024 as cited by WSP, 2026). In 2016 and 2019, the Overstrand municipality had almost the same GDP per capita as the Overberg district.

GDP per capita showed an upward trend at all local, district, and provincial levels from 2016 to 2022. The Gross Domestic Product (GDP) is increasing over the years, hence the increase in per capita income as well (Overberg District Municipality, 2024) as cited by WSP, 2026.

Crime

Crime statistics seem to be decreasing in the Municipality. Overall, contact crime in Overstrand LM have reduced by 33.89% from 2017/18 to 2019/20, sexual crimes increased by 120.39%, cases of aggravated robbery have reduced by 26.95%, contact-related crimes increased by 113.67%, property-related crimes decreased by 7.63%, other serious crimes increased by 271.55%, and crimes detected as a result of police action saw a 59.14% reduction in cases (Crime Hub, 2025, as cited by WSP, 2026).

Spatial Planning and Sensitivity

Bantamsklip is about 6 km southeast of Pearly Beach and 12.2 km south of Baardskeerdersbos, with the latter seeing little real growth as it is considered a rural node, while Pearly Beach is classified as a local node in the Overstrand SDF. Pearly Beach itself sits within a well-defined urban boundary, with no plans for expansion. There are also two very small rural settlements nearby: Wolvengat, roughly 11.8 km northeast of Bantamsklip, and Buffelskags, located about 5.2 km to the south-southeast.

In terms of the economic functioning of this part of the Overberg, it is broadly classified as a “agri-enterprise and small-scale farming resource region (Overberg District Spatial Development Framework, May 2023 as cited by Headland Town Planners, 2026).

The spatial proposal plan for Pearly Beach confirms that the urban development edge does not expand further south along the coast beyond the existing caravan park. This is amplified in the Local Spatial Development and Growth Management Principles which state that (a) Pearly Beach retains

its character as a retirement and tourism village, and (b) contains the urban footprint of Pearly Beach within the existing urban edge. The same principle of not expanding the settlement footprint for the very small settlements of Baardskeerdersbos, Wolvengat or Buffelsjags is noted in the SDF¹⁹¹.

8.3.1.2 Thyspunt

The Eastern Cape is a South African province on the east coast of South Africa along the Indian Ocean, bordered by the Free State, Lesotho, KwaZulu-Natal, the Northern Cape, and the Western Cape (Figure 8-90). Its capital is Bhisho, and the largest city is Gqeberha (formerly Port Elizabeth)¹⁹⁰. The proposed Thyspunt Nuclear Power Plant site is situated within the Kouga Local Municipality, part of the Sarah Baartman District Municipality in Eastern Cape Province. This municipal region encompasses coastal towns such as Jeffreys Bay, St Francis Bay, and Oyster Bay, along with various inland settlements, agricultural areas, and rural communities.

The province has six district municipalities and more than 30 local municipalities. The Project is in the Province's largest district, the SB District Municipality. (Statistics South Africa, 2022 as cited by WSP, 2026).

The Eastern Cape is South Africa's second-largest province at 168,966 km². IsiXhosa is spoken by 82.7% of residents, followed by Afrikaans (10.3%) and English (3.9%). Its population is 7,176,230 (11.4% of the national total), with a density of 42.47 people per 100 km². (Statistics South Africa, 2022; Republic of South Africa, 2025 as cited by WSP, 2026).

The four largest industries in the Eastern Cape Province include personal services (e.g., education), finance, and manufacturing.



Figure 8-90 – Thyspunt in relation to Eastern Cape Province. WSP, 2026

Economy

Agriculture, tourism, and manufacturing drive the Eastern Cape's economy. In 2022, it recorded South Africa's third-highest GDP growth at 2.1%, surpassing the national average by 0.2% (Statistics South Africa, 2022). Its coastal location supports strong potential for Special Economic Zones, such as Coega and East London (Department of Trade, 2025; Republic of South Africa, 2025)¹⁹⁰.

The dependency ratio is concerning as the statistics suggest there are 56.5 non-working-age individuals for every 100 working-age people in the population. (Statistics South Africa, 2022). (Eastern Cape Socio Economic Consultative Council, 2025). The province's overall unemployment rate is approximately 40%, with over half of the youth unemployed. Males had a slightly higher employment rate than females (Eastern Cape Socio Economic Consultative Council, 2025). As cited by WSP, 2025¹⁹⁰.

Sarah Baartman District Municipality

The SB District Municipality covers 34% of the Eastern Cape and is the province's largest district. The SB District is named after an international icon, Sarah Baartman, of Khoikhoi descent, who was born and raised there. It comprises seven local municipalities (Kou-Kamma, Dr Beyers Naude, Kouga, Blue Crane Route, Sundays River Valley, Ndlambe and Makana). It is located in the western

part of the Eastern Cape Province and provides electricity, water, refuse removal, and sanitation services to the local municipalities under its jurisdiction¹⁹⁰.

The district has a network of distinct settlements within a rural area. It has several notable tourist attractions, including the Baviaanskloof Mega Reserve, a World Heritage Site. It also has the Valley of Desolation in Graaff-Reinet, the world's highest commercial bungee jump in Tsitsikamma, and the largest dune field in the Southern Hemisphere in Alexandria. The district is also home to various wildlife, including the Big 5 in Addo Elephant Park. (Municipality, 2020) as cited by WSP, 2026¹⁹⁰.

Poverty

Poverty is a lack of the necessary resources, such as money and adequate shelter, to provide a basic standard of living. Below the Upper-Bound poverty line (UBPL) are individuals who must choose between the two and sometimes cannot afford enough of either. People living in poverty in the district are the highest in the Blue Crane Route LM than in any other municipality. With 55.6% of people living in poverty, over half the population in the municipality are poor.

Of the seven local municipalities in the district, only Kou-Namma and Kouga have poverty rates below 50% (Eastern Cape Socio-Economic Consultative Council, 2017, as cited by WSP, 2026).¹⁹⁰.

Human Development Index

The Human Development Index (HDI) shows that the municipality has made steady progress from 2006 to 2019. This improvement is driven by growth in sectors like retail, insurance, finance, manufacturing, and tourism, all contributing to better living standards. In 2019, Kouga's HDI was higher than that of the SB District Municipality (National Treasury, 2021, as cited by WSP, 2026)¹⁹⁰.

Immigration

Approximately 9.05% of the district's population is international immigrants. The most dominant immigrant group in the district comes from Zimbabwe, contributing 39.3% of the immigrant population. There are also immigrants from Bangladesh, Australia, Belgium, Austria, Canada and Burundi, to mention a few¹⁹⁰.

Crime

Although crime decreased in the Sarah Baartman District Municipality since 2014, it began to increase again in the period of 2018/2019 (Sarah Baartman District Municipality, 2020) as cited by WSP, 2026.

Crime included stock theft, theft out of or from a motor vehicle, burglary at residential premises, and burglary at non-residential premises. The data shows that theft is one of the challenging problems in the SB District Municipality (South African Police Service, 2025) as cited by WSP, 2026.

Kouga Local Municipality

Kouga LM (Figure 8-91) is a Category B Municipality within the SB District Municipality, comprising of the coastal region where the Thyspunt site is located. It has the highest population in the district. The municipality has a total of nine towns: Jeffreys Bay, Humansdorp, St Francis Bay, Cape St Francis, Oyster Bay, Hankey, Patensie, Loerie, and Thornhill.

Based on the latest municipal socio-economic statistics, Kouga is estimated to have approximately 107,014 residents distributed across roughly 31,682 households. The population structure is primarily composed of working-age individuals (approximately 64% aged 15-64), alongside

significant proportions of youth and older adults, resulting in a dependency ratio of about 55 dependents for every 100 working-age persons.

The municipality's socio-economic profile indicates a multifaceted local economy comprising tourism, agriculture—particularly horticulture in the Gamtoos Valley—as well as retail and service industries, all bolstered by coastal attractions including surfing and holiday destinations. These sectors significantly influence Kouga's economic development and employment trends; however, unemployment and persistent socio-economic vulnerabilities remain critical factors in local development planning¹⁸².

There are 46 schools within the Kouga LM, most of which are public. Specifically, there are only nine private schools in the municipality. Of the total schools, 1 is a pre-primary school, eight are secondary schools, 5 are combined, and 32 are primary schools. There are 24 public clinics and three public hospitals. (ArcGIS map viewer, 2016 as cited by WSP, 2026¹⁹⁰). Of the six police stations in the Kouga LM, the closest is the Saint Francis Bay police station, which is 10.7km from Thyspunt. The travelling distance between Thyspunt and the police station is 14.2km via R330.

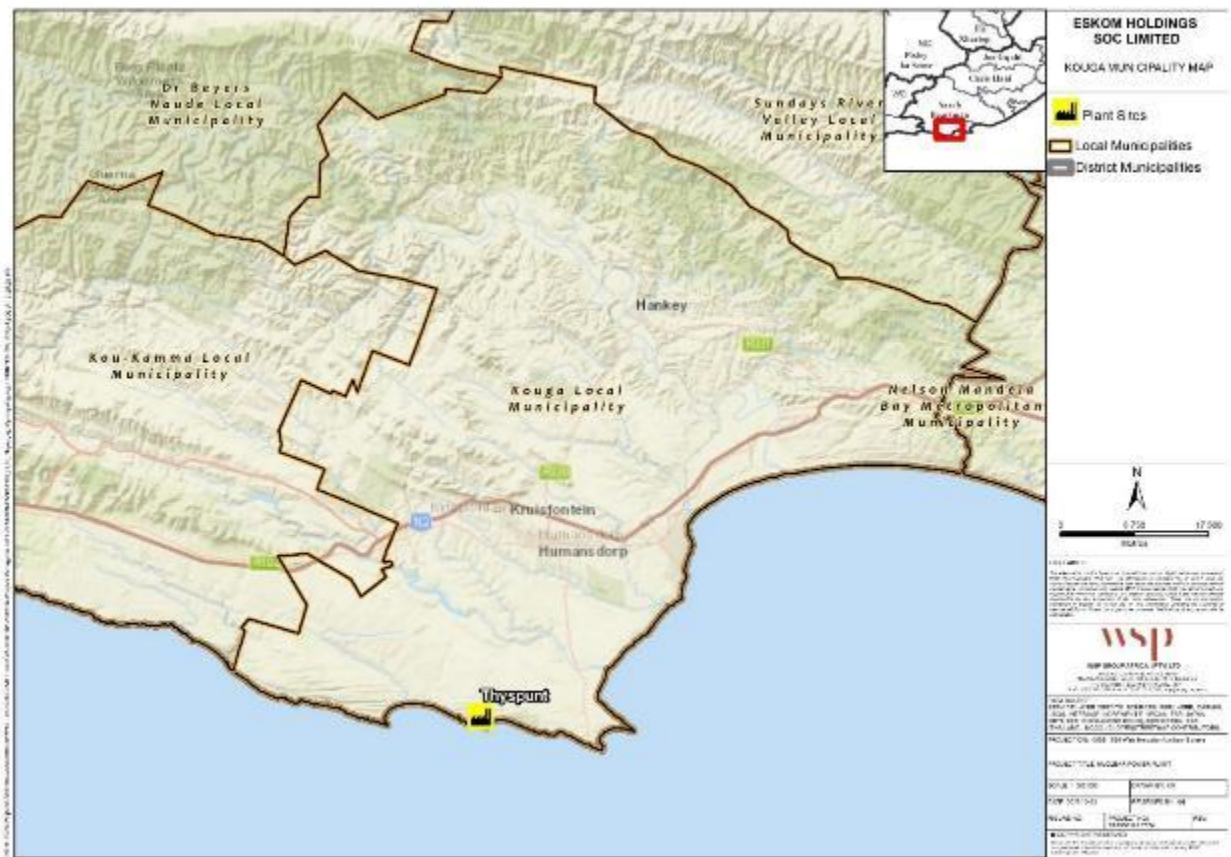


Figure 8-91 – Kouga Local Municipality. WSP, 2026

Population size and density

Kouga is the most populated LM in the SB District Municipality, with a population of 107 014. The population of the Kouga LM has increased by 8 456 people from 2011 to 2022. The population density of this municipality is 40.08 people per square kilometre. Most people in the municipality,

both males and females, are of working age, which could mean they come to the municipality mostly to find employment (Statistics South Africa, 2022 as cited by WSP, 2026¹⁹⁰).

Language and ethnic groups

Kouga Local Municipality is home to a diverse population. The Khoisan were the first inhabitants of the land before the colonial era. The main languages spoken are IsiXhosa, English, and Afrikaans. Coloured people make up the largest group in the municipality, with 54 767 individuals (58.4%) citing Afrikaans as their first language. IsiXhosa is the mother tongue for 29 502 residents (29.9%), while English is spoken natively by 6 331 people (6.1%). Dutch settlers dominated the towns in Kouga LM during the colonial era. Gradually, other ethnic groups came and settled in the towns as well, increasing the municipality's diversity (Statistics South Africa, 2022; Municipalities of South Africa, 2022 as cited by WSP, 2026).

Municipal Services

There are 72.2% of households with access to clean, piped water. 2.1% of the population has no access to piped water. The municipality has provided households access to 20,169 flush toilets and 9,803 flushed septic tank toilets. Although improvements have been made, there are still 2,875 households using the bucket system. It appears that municipal services have been improving over time, with the percentage of people who use flush toilets in the municipality increasing from 51.8% in the 2011 census to 84.7% in the 2022 census (Statistics South Africa, 2022 as cited by WSP, 2026¹⁹⁰).

Political Climate

In the 2022 local elections of Eastern Cape Province, Democratic Alliance (DA) won over 50% of the votes in Kouga LM Local Council election. They had the highest number of seats, followed by the African National Congress (ANC), the Economic Freedom Fighters (EFF), Patriotic Alliance (PA) and Vryheid Front Plus (VFP)¹⁹⁰.

Energy Supply

Electricity is the dominant fuel/energy source for cooking in the municipality, used by 18,837 households. Gas is the secondary source with 9,040 households, dependant on it. Paraffin and wood are also used, with 525 and 155 households respectively. Minimal energy sources include solar, animal dung, and others. 96.9% of households in the municipality receive electricity for lighting (Statistics South Africa, 2022 as cited by WSP, 2026).

Economic Sectors

According to the Eastern Cape Socio-Economic Consultative Council, the primary sector economy of Kouga is driven by mining and agriculture. The Secondary Sector is inclusive of three main sub-sectors: Manufacturing of goods, Electricity generation and distribution, and Construction. The Tertiary Sector has four broad subsectors: Community Services, Finance, Trade, and Transport.

Contribution to the Economy

During the 2016 financial year, Kouga Local Municipality accounted for 3.12% of the Eastern Cape Province's GDP and 0.24% of the national GDP. Achieving the 2025 goal of R200 million in infrastructure investment represents a further significant contribution. Infrastructure development within the municipality supports and enhances the productivity of economic activities that rely on these essential facilities for their operations. (Kwadamedia, 2025 as cited by WSP, 2026).

Spatial Planning and Sensitivity

The Eastern Cape PDP highlights nuclear power as part of its strategy to establish the province as a major energy investment hub, alongside wind, LNG, and shale gas projects. These initiatives aim to boost capital goods and heavy industry, supporting economic growth if benefits and costs are managed effectively. Infrastructure investment is also prioritized for balanced regional development, with each region planning at least one large-scale project; the Sarah Baartman District is noted for a proposed nuclear plant¹⁹¹.

From a provincial level The Kouga Spatial Development Framework (SDF) (February 2021) specifically identifies the Thyspunt site as a possible future nuclear power generation site (Figure 8-92). The special concept map in the SDF indicates the Thyspunt site that is buffered by conservation land and states that no further urban expansion towards the site. St Francis Bay is identified as a secondary node and Oyster Bay as a Rural node. Further afield, Jeffreys Bay and Humansdorp are the Primary nodes¹⁹¹.

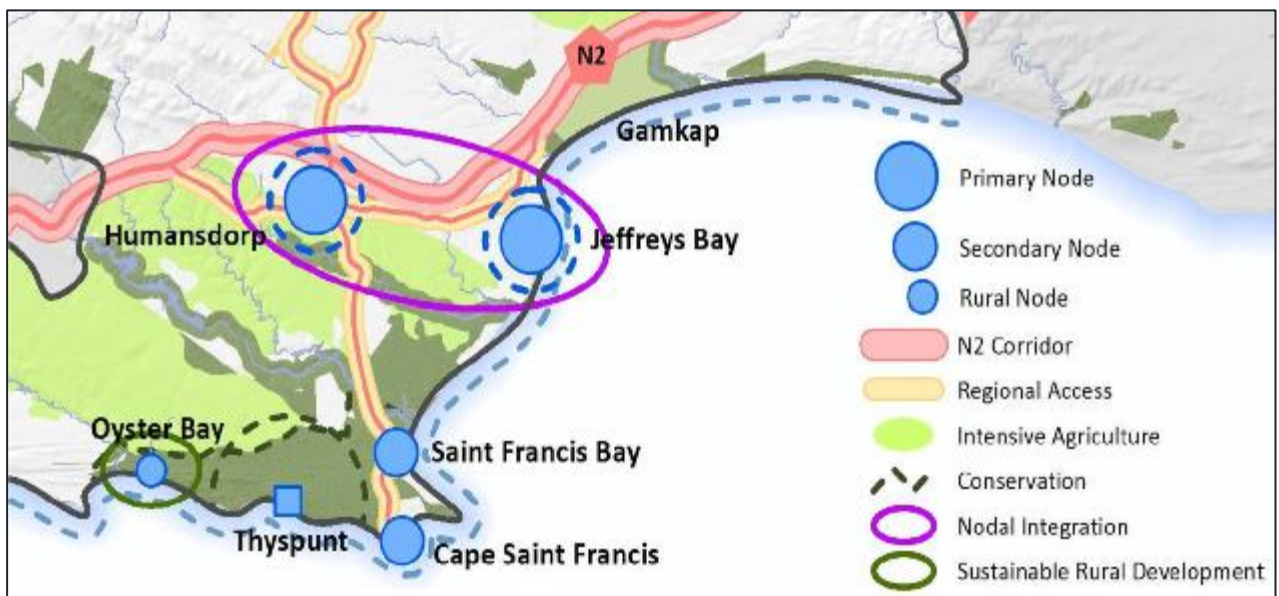


Figure 8-92 – Consolidated Spatial Concept from the Kouga SDF (2021)

Thyspunt is about 10.8 km from St Francis Bay, 8.5 km from Cape St Francis—both experiencing significant household growth—and 4.5 km from Oyster Bay, which also has high growth pressure. However, none of these settlements are expanding toward Thyspunt, and the main regional road from St Francis runs north, away from the site.

The Thyspunt site, located west of Cape St Francis, has been acquired by ESKOM for potential future power generation purposes. Consequently, the Kouga Coast Sub-Regional Structure Plan was developed to maintain the viability of the Thyspunt site as a prospective location for nuclear power generation¹⁹¹.

To facilitate an objective assessment of the site's viability, the Spatial Development Framework (SDF) establishes the following land use principles:

- To safeguard the viability of the Thyspunt site for potential future power generation, development in the surrounding areas must be strictly regulated.

- Any proposed changes to current land uses, as per standard rezoning procedures within the 16km monitoring and emergency zone, must be communicated to the Eskom Nuclear Sites Department at Koeberg Nuclear Power Station for review and input.
- Urban expansion of Oyster Bay and Umzamowethu, both situated within the 0–5km radius, should not be permitted.
- The establishment of a small school (without boarding facilities) to serve local children in Oyster Bay may be considered.
- Institutional land uses that could lead to concentrated residential populations—such as prisons, old age homes, and hospitals—should not be developed within a 16km radius of the Thyspunt site due to potential evacuation challenges.
- No new food processing plants should be permitted within the 16km zone.
- Agricultural activities within 16km of the site are to be closely monitored.

From a municipal level, The Draft Municipal Spatial Development Framework Review (DMSDFR) (2024/2025) gives the following parameters to the proposed site; Careful management of development within the 16km monitoring and emergency zone around the Thyspunt site is crucial to maintain its future potential for nuclear power production. The following recommendations apply to any new projects in this area:

- All proposed developments inside the 16km zone must meet national, provincial, and local laws, including EIAs, land-use approvals, and nuclear safety standards. Any requests for rezoning or changes in land use must be sent to Eskom Nuclear Sites Department (Koeberg Nuclear Power Station) for review before approval.
- Oyster Bay and Umzamowethu (within 0-5km): Urban growth close to the nuclear site should be limited to keep population density low. Institutional facilities like prisons, hospitals, and care homes must not be built within 550m of the Thyspunt site due to evacuation difficulties.
- Only small schools (without hostels) may be established in Oyster Bay to serve local children; larger institutions are discouraged.
- New residential estates or settlements in high-risk zones should be strongly avoided to reduce evacuation challenges during emergencies.
- Food processing plants should not be constructed within 550m of the site to protect food safety and prevent contamination.
- Agricultural practices within this distance should be monitored to assess risks from radiation exposure or contamination.
- Industrial and commercial activities within the 16km zone should focus on non-sensitive uses—those that do not attract large, permanent populations or need risky infrastructure¹⁹¹.

Infrastructure And Supporting Land Uses

Infrastructure planning must take into account the possible development of the Thyspunt nuclear facility, making sure water, electricity, and transportation systems are strong enough for both the plant and nearby communities.

¹⁹¹ Headland Town Planners, 2026.

Supportive uses such as worker accommodation, social venues, and service industries should be carefully placed at safe distances from the nuclear site, while still helping the local economy.

Environmental And Disaster Risk Considerations

Development should follow international safety guidelines for nuclear sites, including buffer zones, emergency evacuation routes, and measures to protect the environment.

Sensitive coastal and wetland ecosystems near Thyspunt must be preserved to prevent long-term environmental harm.

8.3.2 VISUAL

Both the sites are located close to the coast and in predominantly low growing shrubland consisting of fynbos and invasive alien vegetation such as Rooikrans. The low ground cover does not assist in any visual screening or blending with the landscape, especially bearing in mind the scale and magnitude of the project components.

The study areas are situated near the coastline, where variable weather can influence atmospheric conditions such as mist, rain, haze, and smoke. These factors can cause large structures to appear more distant, thereby reducing their apparent size and visual impact. In clear weather, bright lighting may enhance the visibility of these structures, whereas overcast or polluted conditions tend to diminish their brightness and contrast. Public perception of nuclear power plants is often influenced by prevailing weather. On clear days, these facilities may be more conspicuous, while in foggy or rainy conditions, they may go largely unnoticed. Thus, atmospheric conditions can either lessen or amplify the visual prominence of such structures, making them less noticeable in certain scenarios or more striking in others¹⁹².

The visual baseline information has been provided through BCK,2026¹⁹².

8.3.2.1 Bantamsklip

The proposed Bantamsklip site is located along a rocky coastline, oriented northwest to southeast between Franskraalstrand (northwest) and Quoin Point (southeast). The underlying rock supports a shoreline terrace at approximately 20 meters above mean sea level (amsl), which is designated as the location for the nuclear power plant. The site itself is situated on this terrace adjacent to the local rock promontory known as Bantamsklip, while the associated farm is registered as Hagekraal.

This rocky terrace extends inland and is predominantly covered by sand, with thickness ranging from a few centimeters up to 40 meters near the parallel sand dunes closer to Coast Road R43. The narrow coastal plain gradually ascends to a plateau, reaching an elevation of approximately 195 meters amsl at Carruthers Hill, situated about two kilometers inland.

Within a 15 km radius of the site, there are three local river and wetland systems that drain the southern edge of the plateau. The Boesmans River and Haelkraal River discharge into the sea just

¹⁹² BCK, 2026. Visual Impact Report -Scoping Phase. Bantamsklip and Thyspunt.

south of Franskraalstrand and Pearly Beach, respectively, while the Ratelrivier enters the sea east of Quoin Point.

Four prominent high points occurring along the southern edge of the plateau. These are Wolfhuiskop (274 m amsl), Hagekraal (212 m amsl), Carruthers Hill (195 m amsl) and Buffelsjagberg (311 m amsl)¹⁹².

The sand-covered rock terrace gradually rises toward steeper plateau slopes inland. The NPP is not visually screened from inland or coastal areas by large platforms as shown in Figure 8-93 and Figure 8-94, based solely on landform contours. However, dense roadside vegetation and beach houses block views at certain spots. Mountain ranges further inland generally screen the project from the northern interior.



Figure 8-93 – View towards the site the edge of Pearly Beach. BCK,2026



Figure 8-94 – View east towards Buffeljachtbaai. BCK,2026

Vegetation

The dune field on the coastal terrace between the sea and the R43 is covered with vegetation both exotic (Port Jackson Wattle) and indigenous (Strandveld). The former has established dense thickets either side of the R43, while the indigenous plants predominate on the portion of the terrace that is closer to the sea.

The Strandveld vegetation may provide no visual screening of the proposed Bantamsklip NPP. However, the taller Port Jackson thickets can effectively screen most views towards the site from the R43 because of their closeness to the road user. The relatively flat and uniformly textured vegetation of the landscape types will visually contrast significantly with the proposed project making it more visible in the landscape.

The low vegetation height does not assist in screening the proposed development, nor does it assist in blending it with the landscape¹⁹².

Sense of Place

According to Lynch (1992) as cited by BCK, 2026, a sense of place is the extent to which a person can recognise or recall a place as being distinct from other places - as having a vivid, unique, or at least particular, character of its own. The sense of place for the study area derives from the local landscape types described above and their impact on the senses. The quality, or *Genius Loci*, is a function of attributes such as the scenic beauty or uniqueness and distinctive character of the built and cultural landscape.

The unique sense of place for this site comes from its remote location, far from communities, and its untouched coastline that stretches for kilometres. The setting appears entirely natural, with no visible signs of human presence, which adds to its special atmosphere. The rugged rocky shoreline, hardy coastal vegetation, and strong easterly winds combine to create a visually striking landscape that feels wild and untamed. Its isolation and limited access contribute to an air of mystery and tranquility, emphasizing the dominance of natural forces, especially the waves crashing on the rocks¹⁹².

However, if the Bantamsklip NPP is built, the scale of physical changes needed onsite and nearby would be substantial. Maintaining the current ambience and sense of place would prove extremely challenging, as the large-scale development could overpower the site's natural features and transform it into an industrial environment¹⁹².

Land Use

The current land use between the coastline and the R43 within a radius of 15 (km) is undeveloped and is mostly in its natural state. However, large areas of the vegetation seaward of the R43/R317 have been invaded by the Port Jackson Wattle. There are four areas of the Walker Bay State forest land in this zone. These areas are effectively nature reserves as no commercial tree species have been planted.

Franskraalstrand (20 km) and Pearly Beach (7 km) are mainly holiday villages with small retired communities. To the south-east, the coast is largely undeveloped except for a few homes at Buffeljachtbaai and an abalone farm near Plaatjieskraalbaai.

Northeast of the R43, the land consists mostly of private farmland and nature reserves, including part of Agulhas National Park bordering the study area. The surroundings are sparsely populated, especially towards Quoin Point. The proposed Bantamsklip NPP will be visible to Pearly Beach residents—the largest community within 15 km—as well as other coastal homes, Buffeljachtbaai, and travellers on the R43/R317.

Establishments dependent on scenic value and tourism, like nature reserves and Agulhas National Park, will be notably impacted¹⁹².

Visibility

The area is flat, open, and exposed, allowing unbroken views of the NPP structures for over 10 km along a northwest-southeast axis. North of the R43/R317 road, visibility is limited to 1-2 km but stretches up to 15 km northwest and 10 km southeast; beyond 15 km, views are minimal due to distance. The communications tower (100 m) and meteorological mast (120 m) are more visible, especially at night due to aviation lights, though their slim profiles make them less noticeable during the day.

Winter brings wet, misty weather with east-northeasterly winds averaging 5.8 km/h from May to September, while summer is mostly clear with westerly winds averaging 45 km/h.

Sensitive receptors include Pearly Beach, Buffeljachtbaai, Quoin Point, various nature reserves (Groot Hagelkraal,

Quoin Point, Agulhas, Uilkraalsmond, Kleyn Kloof), game farms, lodges, guesthouses, and travelers on the R43/R317 roads. Dyer Island Provincial Nature Reserve is about 15 km west, with most homesteads located near Buffeljachtbaai.

The greatest impact may be expected within the 0-2.5 km zone of visual influence. This zone includes the R43. Direct views within the zone are possible from the southern edge of the adjacent hills. Sections of the Pearly Beach nature reserve and the Agulhas National Park fall into this zone

Pearly Beach is approximately 7 km to the west and Buffeljachtbaai is approximately 6km to the east of the site. Both areas are exposed to the NPP as the topography and vegetation cover do not provide any form of screening. Several nature reserves will be impacted as there is no screening provided by topography and or vegetation. Quoin Point nature reserve is on the edge of the 5-10 km zone and, although exposed visually to the NPP, distance will diminish the impact.

The Bantamsklip NPP may be expected to be less visible during the months of May to September (5 months) than during the months of October to April (7 months) because of the reduced visibility caused by rain, mist and overcast conditions.

The on-site lighting will extend the area of visibility at night of the Bantamsklip NPS. During the misty winter season, due to the diffusion of the light by moisture, the light glow will be visibly softer. During the summer the light will be sharper and more localised around the NPP¹⁹².

8.3.2.2 Thyspunt

Topography

The highest part of the dune field associated with the Thyspunt topography is about 2 km from the coast and reaches 100 m in elevation, with peaks at 111 m and 122 m amsl. Vegetated dunes between this area and the shore stand around 70–80 m amsl and descend to a terrace 20 m above the rocky coastline. Inland, the land rises gradually to a low hill—6 km from the coast—with its long axis running east-west and a peak of 160 m amsl.

Any large structure within the study area will be visible for extended distances, as illustrated by BCK's photos in **Figure 8-95** and **Figure 8-96** below. However, the generally east-west orientated dunes and hill screen the views of the site from areas inland.



Figure 8-95 – View towards the site from the Conservation Office. BCK,2026



Figure 8-96 – Typical low vegetation within the site. CK, 2026

Vegetation

Dominant vegetation on the site includes dune fynbos and the Sand River primary dune community. The area demonstrates considerable habitat diversity, incorporated by various vegetation types such as subtropical forest thicket. Closer to the coast, dune fields have been stabilized by indigenous and exotic plants. The windward dunes exhibit dense, wind-pruned growth, whereas the “slack” regions support taller, denser vegetation shielded from the wind.

The vegetation on the exposed seaward side is only 2-3 m tall and does not obscure the Nuclear Power Plant. Trees in the lower areas are also below dune height and offer no screening. Overall, the vegetation does not effectively screen the NPP, though it may provide partial screening from nearby viewpoints or residences¹⁹².

The relatively flat and uniformly textured vegetation of the landscape types will visually contrast significantly with the proposed project making it more visible in the landscape¹⁹².

The low vegetation height does not assist in screening the proposed development, nor does it assist in blending it with the landscape.

Sense of Place

According to Lynch (1992), a sense of place is the extent to which a person can recognise or recall a place as being distinct from other places - as having a vivid, unique, or at least particular, character of its own. The sense of place for the study area derives from the local landscape types described above and their impact on the senses. The quality, or Genius Loci, is a function of attributes such as the scenic beauty or uniqueness and distinctive character of the built and cultural landscape.

The character of the area is mainly defined by its isolated setting and the sharp, narrow rocky shoreline that rises steeply to a sandy rock terrace. This rugged boundary between land and sea feels private, in part because access to Eskom property is restricted. Looking inland, views are limited by rows of vegetated dunes.

This landscape combines a secluded atmosphere with a wild, sensory richness, owing to its isolation. While there isn't much variety in what you see, the untouched rugged coastline and empty scenery provide impressive visual appeal¹⁹².

Building and running the proposed Thyspunt NPP would be expected to permanently change this sense of place. The large scale and industrial nature of the Thyspunt NPP will dominate the site, replacing its natural, remote qualities with an industrial environment¹⁹².

Surrounding Land Use

The land use between the coast and the ridgeline of inland vegetated dunes is primarily nature reserve. The western edge of the reserve abuts the coastal village of Oyster Bay while the eastern edge borders land that is undeveloped and in private ownership. This land has several private houses, mostly holiday homes which are built near the edge of the consolidated dunes and overlook the rocky seashore (Figure 8-97).

A prior township application was submitted for Rocky Coast Farm near Cape St. Francis's western boundary. The current proposal suggests clustering new homes near existing residences, with the remaining land designated as a nature reserve.

New and existing homes east of the site may have partial or direct views of the Thyspunt NPP. However, most residential areas are shielded from the development by dunes, with only taller structures like the meteorological mast and communications tower visible from Oyster Bay. Only the western edge of Cape St. Francis, about 10 km away, will have visual exposure to the development¹⁹².



Figure 8-97 – Households located east of the proposed Thyspunt site. Gibb, 2016

Visibility

The visibility is dependent on the topography, atmospheric conditions and vegetation and can be described as the area/points from which project components will be visible

The primary visual receptors affected by the proposed development are those most susceptible to visual intrusion, including users of public roads, towns, villages, game farms or nature reserves, lodges, settlements, and farmsteads in close proximity to the site.

The current landscape is characterized by undulating and open topography, which does little to mitigate visibility. Due to the substantial scale of the NPP, structures may be continuously visible—uninterrupted—for distances exceeding 15 km along much of the coastline. Beyond this range, although the development remains discernible, its prominence within the landscape decreases significantly due to the exponential effect of distance. Intermittent views primarily occur eastward along the longitudinal dunes for approximately 5 km. A strip extending northwest, within the 2.5 km to 10 km zone, is exposed to the watershed line north of the site, an area already altered visually by wind turbines.

Two prominent structures are included in the NPP infrastructure: a communications tower approximately 100 m in height and a meteorological mast around 120 m. While their visibility is extensive, their slender profiles reduce daytime detectability except at night, when red flashing lights required by the Civil Aviation Authority make them more noticeable.

Although not all homesteads are permanently occupied, many are situated in direct line of sight within the 0-5 km zone, where visual impact may be significant. Several homesteads serve as holiday residences, some of which are leased by Eskom. Additional sensitive receptors include Oyster Bay (approximately 6 km west of the site), the western edge of Cape St. Francis, and travellers using principal routes such as the coastal road from St Francis Bay to Oyster Bay, R330, R102, and the N2¹⁹²

The primary visual impact occurs within 0–2.5 km of Thyspunt NPP, affecting some holiday homes and Rebelsrus Nature Reserve. Oyster Bay lies at the 5 km boundary but is mostly shielded by dunes; Cape St. Francis, about 12 km away, will experience minimal impact. Most of the adjacent coastline, except Oyster Bay, will be exposed to the Project.

Thyspunt NPP is less visible from May to September due to frequent rain and mist, compared to clearer conditions from October to April. At night, on-site lighting increases visibility of a plant. In winter, moisture diffuses the light, creating a softer glow, while in summer the light appears sharper and more localised.

Climatic Effects on Visibility

Winter weather is characterized by wet and misty conditions driven onshore by predominant westerly winds. From October to March, strong onshore winds at the sea surface increase vertical wave movement.

8.3.3 HERITAGE AND ARCHEOLOGY

The baseline information in this chapter has been provided through CTS Heritage's High Level Desktop Heritage Report for Bantamsklip¹⁹³ and Thyspunt¹⁹⁴. The findings from ACO Associates HIA in 2012 of this same area have been included in the CTS (2026) and this report.

¹⁹³ Heritage Desktop report. CTS25_107 CTS Heritage, 2026.

¹⁹⁴¹⁹⁴ Heritage Desktop report. CTS25_107 CTS Heritage, 2026.

8.3.3.1 Bantamsklip

CTS quotes from ACO Associates 2012 HIA in stating that “the Bantamsklip site comprises uncultivated farmland bordered by CapeNature-managed state land to the east and west. The Overberg district coastline is known for its scenic wilderness and rich archaeology (Aikman et al. 2005), but the area around the proposed nuclear site has not been thoroughly investigated.” Hart’s HIA (2012) found that cultural, archaeological, and palaeontological resources likely remain unchanged, except for possible erosion effects, making the assessment still relevant.

The DFFE Screening Report rates the site’s archaeological sensitivity as “High” due to its proximity to a Grade IIIb Heritage Site (Figure 8-98).



Figure 8-98 – DFFE Screening report - Bantamsklip - Archaeological sensitivity

The CTS Desktop Review indicated that the Bantamsklip site is an area with “medium coverage” (Figure 8-99) and a site that has many previous heritage resources identified on it from previous assessment (Figure 8-100), as accessed through SAHRIS and the Overstrand GIS platform¹⁹³.

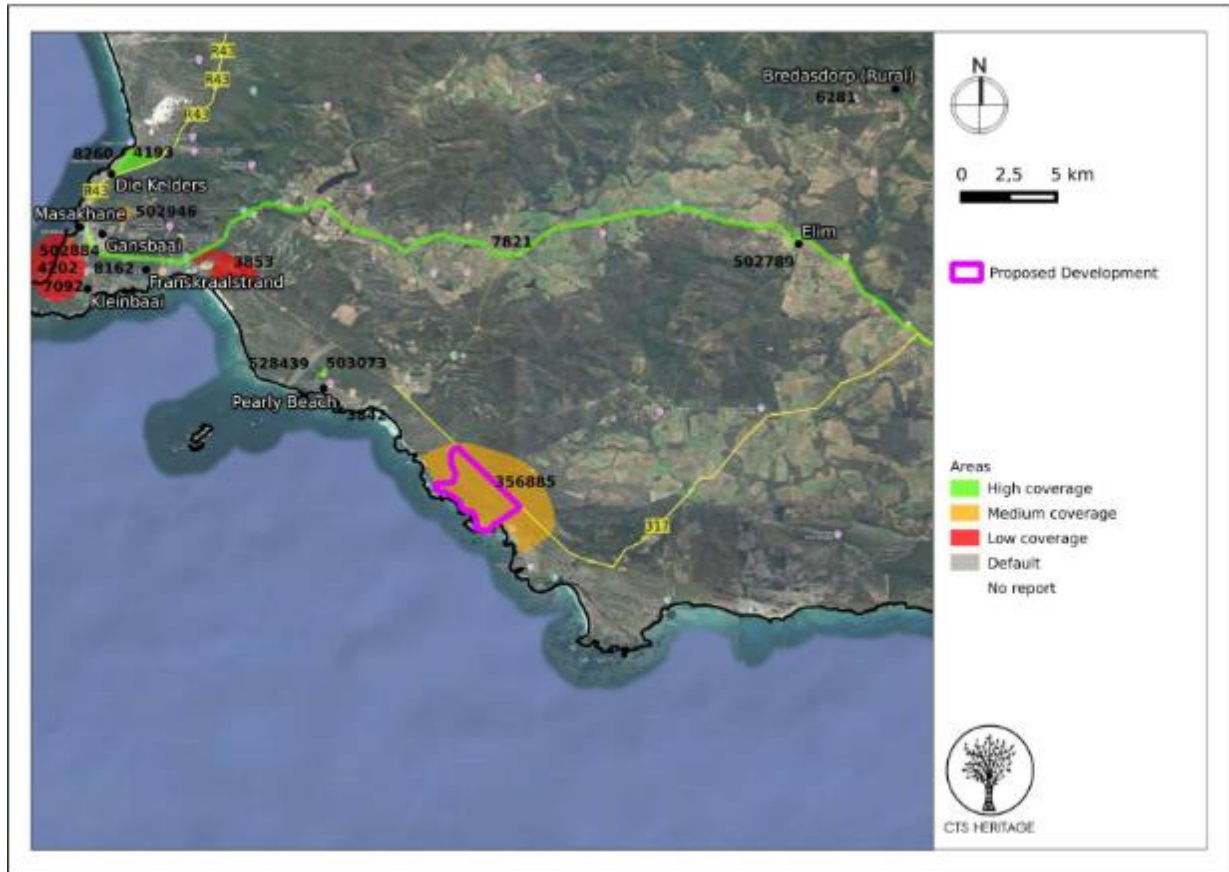


Figure 8-99 – Previous Heritage Impact Assessments surrounding the proposed development area. CTS, 2026

The area is recognised for its occasional Earlier Stone Age artefacts (Kaplan 2009, NID 7702); significant Middle Stone Age sequences within cave sites; extensive shell middens along the rocky shorelines and into the coastal dune belts—often associated with burials; stone tool scatters; and stone-built fish traps situated in the intertidal zone (Avery 1974, Hart and Halkett 2010, NID 194682 as cited by CTS, 2026). Collectively, these resources indicate continuous and extensive utilisation of the region since at least 80,000 years ago, during which pre-modern humans frequently occupied the coastal caves.

In more recent periods, specifically the Later Stone Age, hunter-gatherers—and subsequently herders—occupied deflation hollows within the dune belts, utilising seasonally available marine shellfish, fresh water sources, and, for pastoral Khoe communities, grazing in this comparatively well-watered environment. Archival and archaeological studies of the fish traps suggest they date from the colonial era (Hine 2007, NID 356929), maintained into the 20th century by local communities (Avery 1975 as cited by CTS, 2026). However, there remains a possibility that this tradition may have originated locally in pre-colonial times (Hart and Halkett 2010, NID 194682 as cited by CTS, 2026). Elsewhere, such resources have been designated National Heritage Sites. Satellite imagery does not reveal any visible fish traps in proximity to the study area¹⁹³.

Nearby, Die Kelders Cave 1 (SID 25308) is designated as a Provincial Heritage Site and is an internationally acclaimed archaeological location of considerable scientific significance. Die Kelders is accessible to the public without access monitoring, rendering its fragile archaeological deposits—

located within the Walker Bay Nature Reserve and promoted locally as a tourist destination—and Klipgat Cave highly susceptible to both visitor-related degradation and vandalism. Webley (2008, SAHRIS NID 7828) notes: "To summarise the above evidence, excavations in the 1970s at Die Kelders near Gansbaai have provided early evidence (1600 years ago) for the introduction of pottery technology and domestic stock into the Cape, as well as a MSA (Middle Stone Age) occupation over 40,000 years old." Although no comparable cave sites are presently identified within the development area, the proximity of this significant archaeological site to the proposed development highlights the potential presence of archaeological resources that may be affected by the project¹⁹³.

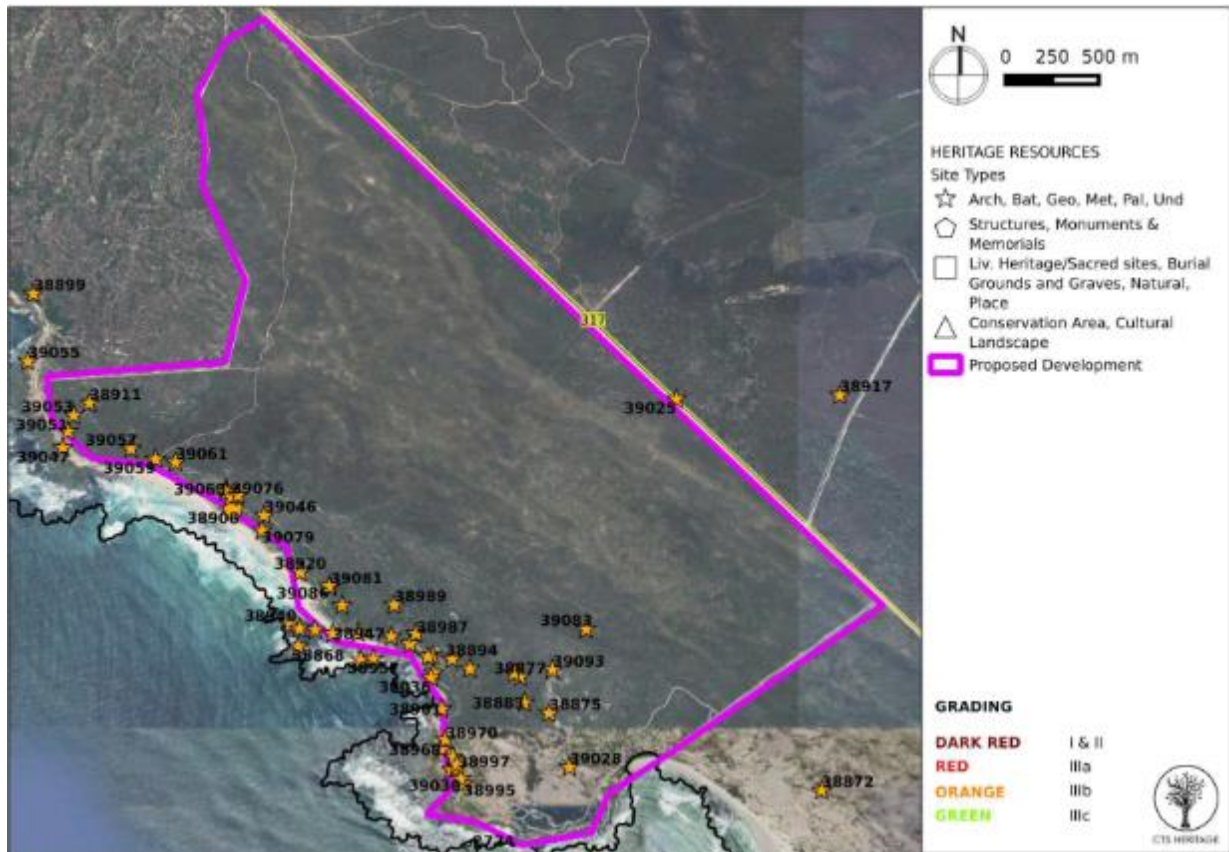


Figure 8-100 – Heritage Resources were previously identified in and near the study area.
CTS, 2026

Archaeology

Archaeological research in the area dates back to the 1930s (Goodwin 1938 as cited by CTS, 2026), providing a clear understanding of its heritage. Hart's 2012 survey found that the study area and nearby land to the west contain diverse archaeological materials, from Middle Stone Age scatters to Late Stone Age shell middens, as well as tidal stone fish traps. Colonial heritage is limited to Groot Hagelkraal farm buildings and an old boundary wall along the proposed nuclear corridor.

Middle Stone Age material is scattered across exposed fossil dune and calcrete surfaces, primarily on the site's eastern side. These quartzite flakes and cores are disturbed by erosion and may also be present on buried palaeosols under sand bodies. While high concentrations exist, no distinct archaeological sites were identified—these accumulations are due to natural processes. No fossil bones have been found here; however, dispersed shellfish found on site likely represent Late Stone

Age occupation. In-situ material within the fossil dunes is possible but would require excavation beyond the study's scope to identify this¹⁹³.

Late Stone Age shell middens are abundant within 400 meters of the coastline in this area, with the highest density found within 200 meters of the shore. During the 2012 study, approximately 115 occurrences were identified. Further inland, away from the shoreline, discrete middens can be observed. All observations of Late Stone Age middens occurred within the nearshore zone and the vegetated dune cordon comprising secondary and tertiary parallel dunes. No middens were identified on the flat coastal plain located inland from the dune complex. However, Late Stone Age sites were recorded in caves and rock shelters within the limestone complex further inland, though this area lies beyond the proposed power station footprint.

Middens situated near the shoreline are characterized by concentrations of *Haliotis midae* shells. Shellfish present include numerous *Turbo sarmaticus* (Alikreukel), *Choromytilus meridionalis* (black mussel), additional *Haliotis midae*, *Oxystele* species, *Burnupena* species, and various limpets, notably *S. argenvillei*, *C. longcosta*, and *S. granatina*. Artefactual assemblages at these sites tend to be informal, predominantly featuring quartzite chunks, flakes, and flat boulders used as grinding surfaces. Notably, exotic raw materials such as silcrete are exceptionally rare. Fragments of Cape Coastal Pottery were found associated with a minority of middens, suggesting some occupations are less than 2,000 years old. Other cultural items, such as ostrich eggshell beads, were found here.

Unlike much of the South Coast, the immediate coastal sites have generally remained undisturbed by coastal tracks or ad hoc roads accessing the beach. Although some sites have been exposed by these tracks, overall site preservation is good, with many deposits being stratified and retaining significant research potential. It is noteworthy that the Bantamsklip middens are highly similar in content.

Based on the predominance of *Haliotis midae* shells at these immediate coastal sites, these localities are interpreted as "de-shucking stations," where prehistoric populations processed shellfish to reduce weight and bulk before transporting them elsewhere, perhaps to shelters in the limestone formations at Byneskranskop and Hagelkraal. The archaeological material aligns with assemblages commonly associated with settlement in the Cape after 2,000 years ago; however, recent unpublished work by ACO suggests that informal artefact assemblages reflect the last 3,000 years of coastal human settlement and are not exclusively linked to the advent of pastoralism. In summary, evidence indicates continuous use of the coastline by ancestors of Khoekhoen herders and San hunter-gatherers from approximately 3,000 years ago to the historic period¹⁹³.

Shipwrecks

Shipwrecks are significant heritage sites in this region, protected as Grade I resources by SAHRA. Notable wrecks include the Birkenhead (1852), Ellida (1888), and Seegans (1991), with various vessels present at different depths and distances offshore. The Overstrand Municipality Heritage Data notes a known wreck at the mouth of the Buelsjacht River.

Palaeontology

The broader study area is underlain by geological units of Low to Very High palaeontological sensitivity based on the SAHRIS Palaeosensitivity Layer. According to the 3319 Worcester Geological Map, the area is underlain by Qw: Waenhuiskrans Formation, Qsr: Strandveld Formation (Bredasdorp Group).

The DFFE Screening report identifies the Bantamsklip site to have “Very High” sensitivity as it contains palaeontological features with Low, Medium and High and Very High sensitivity (Figure 8-101).

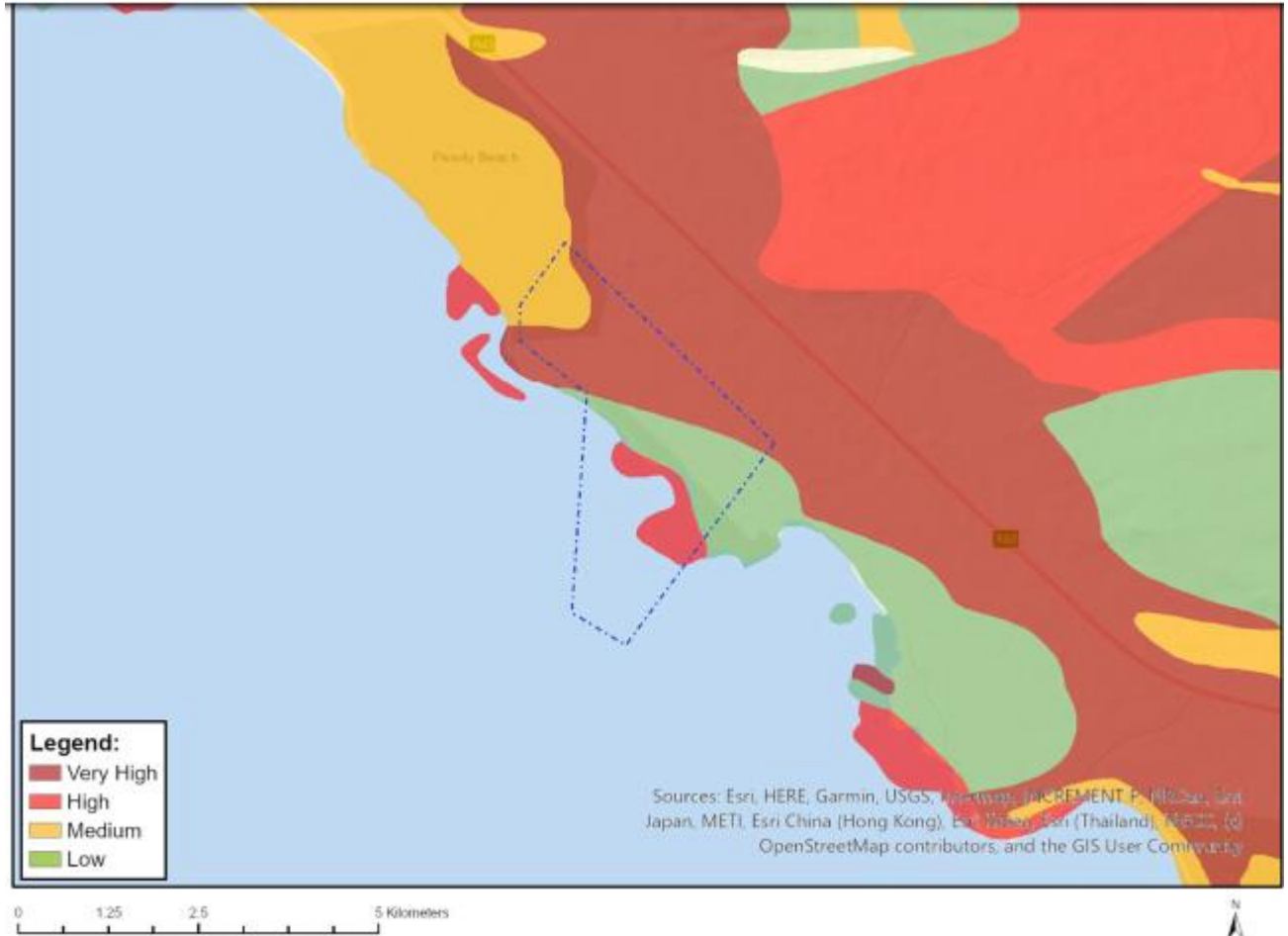


Figure 8-101 – DFFE Screening Report -Bantamsklip Palao Sensitivity

HTS confirms the presence of highly sensitive palaeontology associated with the site in Figure 8-102.

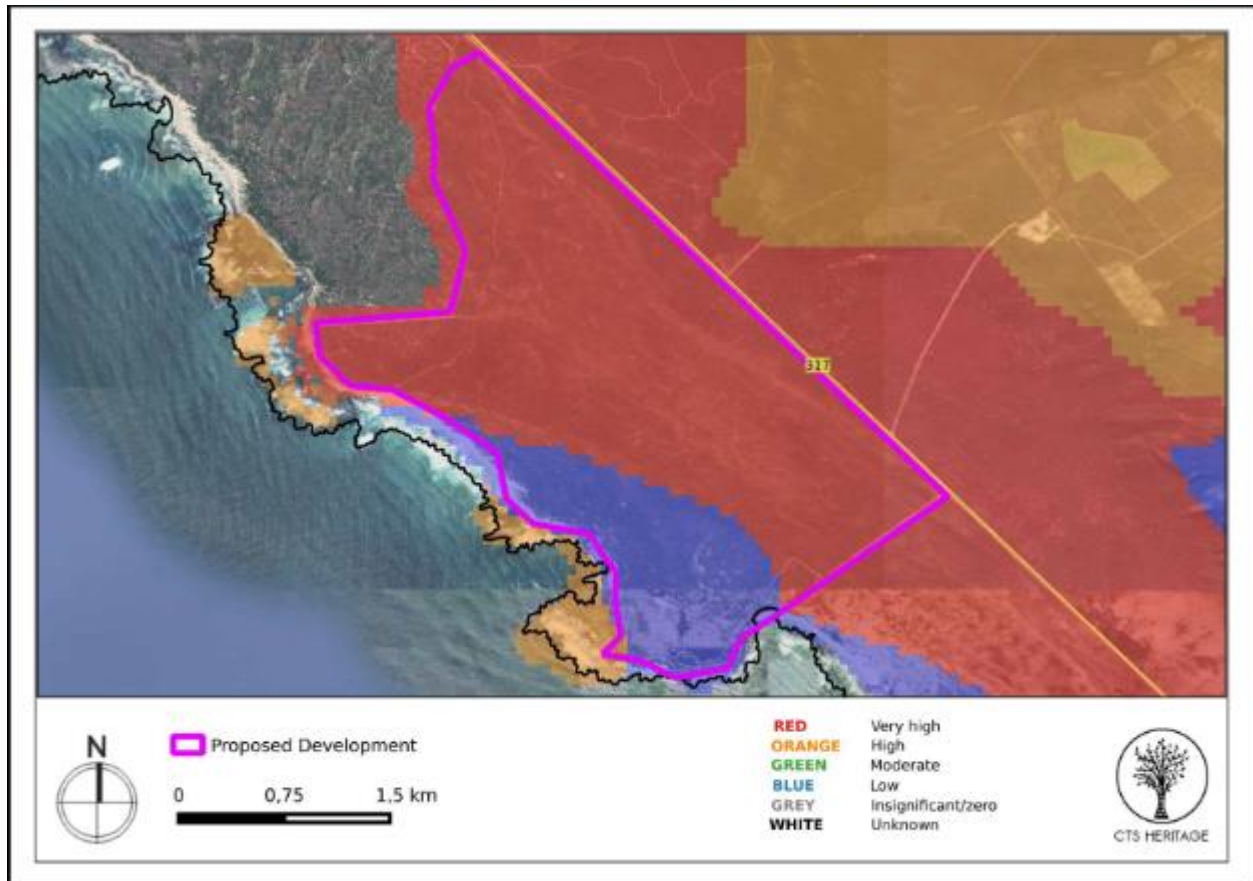


Figure 8-102 – Palaeosensitivity Map. Indicating Very High fossil sensitivity underlying the study area. CTS, 2026

Almond (2012) as cited by CTS, 2026, conducted a PIA for the site. The study area sits atop a wave-cut platform of tough quartzitic bedrock from the Peninsula Formation, covered by a thin layer ($\leq 11\text{m}$) of late Caenozoic Bredasdorp Group sediments. Bedrock platforms at both south coast sites are TMG sediments, Early Palaeozoic in age, highly deformed, and unlikely to contain well-preserved fossils—only sparse trace fossils are expected here.

Coastal sediments from the Bredasdorp or Algoa Groups vary in palaeontological sensitivity (low to high), mainly consisting of Quaternary aeolianites with occasional calcrete horizons. Subsurface terrestrial fossils such as snail shells, rare vertebrate bones, teeth, trackways, and organic-rich peats may occur within these aeolianites, particularly along palaeosol horizons. Bantamsklip's overall palaeontological sensitivity is moderate to low¹⁹³.

8.3.3.2 Thyspunt

Pre- colonial Heritage

The south coast of South Africa has been recognized by archaeologists as vital to understanding regional prehistory. Sites such as Cape St Blaize and Nelson Bay Cave have named various stone tool industries, highlighting the area's archaeological importance, as stated by Goodwin. Despite his call for preservation, protection has been inadequate.

Recent research supports the Southern Cape's heritage significance, revealing human occupation since the Early Stone Age, possibly dating back 700,000 years. Key sites like Blombos and Klasies River Mouth provide rare evidence of early modern human behaviour and abstract thought.

Klasies River Mouth, approximately 40km west of the study area, is especially significant. First reported in 1955, it contains deposits studied since the 1960s, with excavations uncovering multiple Middle and Later Stone Age phases. Human remains dated up to 120,000 years ago suggest possible cannibalism and modern cognitive abilities. Artefacts indicate symbolic behaviors, but food strategies were not fully developed.

At Thyspunt and Cape St. Francis, numerous Holocene-era Stone Age sites and shell middens have been studied. Excavations at Cape St. Francis unearthed burials with artifacts, including a shell necklace, ochre, and a dog—suggesting Khoekhoen pastoralists' presence.

Several hearth-like stone platforms and an open-air Howiesons Poort assemblage were discovered, indicating complex environmental conditions during the Last Glacial period. Johan Binneman conducted extensive surveys, identifying sites with artefacts spanning the last 7,000–10,000 years and describing a new tradition, the Kabeljous industry. He found microlith-rich sites, ceramic-rich sites linked to Khoekhoen herders, and ESA/MSA artefacts, including extinct animal remains.

Binneman's research highlights the diversity of local archaeological sites, most within 300m of the coast. Nilssen's mitigation work revealed additional shell middens, often hidden by sand and vegetation, emphasizing the need for careful evaluation of heritage significance¹⁷⁴.

Colonial Period

About 2,000 years ago, pastoralism disrupted the longstanding tradition of hunting and gathering along the South Coast. Before British colonisation in the early 1800s, Khoekhoen herders formed powerful communities from the coastal plain to the Great Karoo, sharing territory with Eastern farming populations. European Trekboere accelerated formal colonisation, and land previously seen as communal by the Khoekhoen became inaccessible.

Research indicates Thyspunt comprises Farm 744 and unregistered state land, Farm 741, both in the Humansdorp District. Farm 744 consists of parts of Welgeleë, Buffels Bosch, and Langefontein, all granted during early British rule (1816–1817), with ownership largely staying within families.

Welgeleë originated as a quitrent grant in 1817, subdivided in 1886, and was described as grazing land with one spring and no buildings. Buffels Bosch, granted in 1816, saw its title reissued in 1890 to multiple owners, showing roads, four buildings, springs, and dams by 1886; it was later partitioned several times. Langefontein began as Erf 467 (Oesterbaai), granted in 1817, later divided in 1963, and featured a spring running to the ocean.

The site's colonial heritage is typical for the area: modern farm buildings likely relate to early structures identified on historic diagrams, and only one old cottage remains inland, probably a Bywoners dwelling¹⁷⁴.

Cultural landscapes

The study area's cultural landscape is defined by its rich natural heritage and high biodiversity. One unique feature is the active dune field—a headland bypass system stretching almost 15 km—which, combined with a variety of archaeological and palaeontological sites, makes it one of the few

remaining landforms of this size and type in the country. The coastal wilderness, together with its archaeological significance, stands out and greatly shapes the region's character¹⁷⁴.

The DFFE Screening Report for Thyspunt identified the proposed site as having “Very High” archaeological and cultural sensitivity for being within 100m of a Grade 111b Heritage Site, within 50m of a Grade 111c Heritage Site, and 100m of an ungraded heritage site (Figure 8-103).



Figure 8-103 – DFFE Screening Tool - Thyspunt - Archaeological and Cultural Sensitivity

Previous HIA conducted for the Thyspunt site noted that the site has been historically well studied. Stakeholders including the local Khoisan group known as the Gamtkwa community have voiced concerns about the preservation of their heritage and their connection to it as claimed descendants of the Khoisan people.

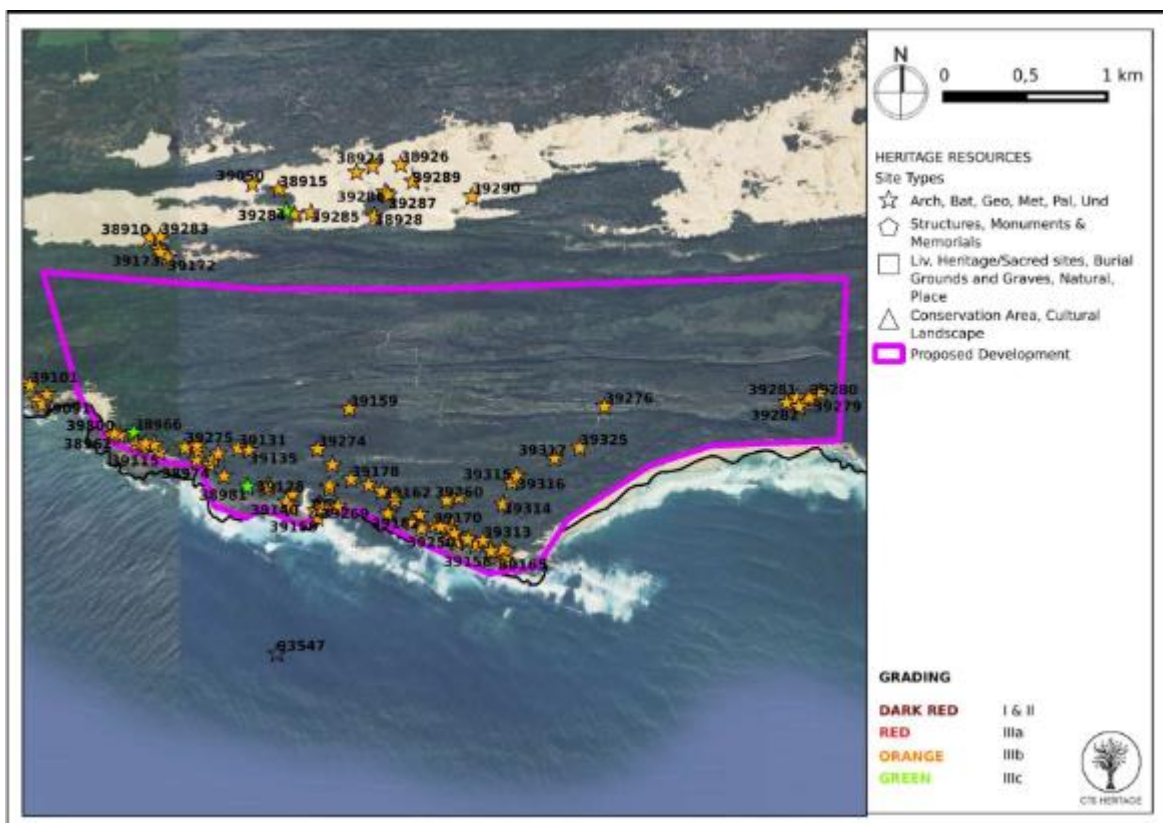
The Thyspunt study area, recognized as a natural heritage site, features various landforms that have influenced where and how many heritage sites exist. Its most inland section, a narrow strip, consists of leased meadows used for dairy farming. Between these farmlands and the sea lies a vast dune field, with about 15 km of active, shifting sand. Closer to the shore, the dunes become stable and support dense coastal thicket and Fynbos vegetation. Many dune bays contain wetlands, and some ancient surfaces exposed among shifting dunes collect fresh water in pools. Vegetated dune peaks can reach up to 10 meters above sea level, gradually descending toward the coast in substantial undulating patterns. Most of the coastline is rocky and dynamic, except for a stretch of beach at Thysbaai. Springs emerge at the base of the dunes, creating freshwater pools and

wetlands along the shoreline, which are lush and often swampy. Two small sheltered bays—White Point and Tony's Bay—are notable, with Tony's Bay containing a substantial stone fish trap system. Wildlife in the area includes small- and medium-sized antelope, bush pigs, small carnivores, and numerous bird species. Historically, like Bantamsklip, the shoreline would have been rich in marine resources for prehistoric communities¹⁷⁴.

Regional Heritage Context

A deeds survey indicated that farms in this region were initially granted by the British colonial government during the 1820s, while substantial portions of land remained designated as "Crown" or government property until recent times.

There is minimal published information regarding the colonial-era history of Oyster Bay and Cape St. Francis; however, it is documented that the Kromme River was historically navigable by light steamers and small sailing vessels. The area's historical significance lies in its origins as an informal port. Coastal shipping trade in the nineteenth century played a vital economic role, serving as the sole method for transporting large volumes of goods efficiently. The Seal Point lighthouse at Cape St. Francis, constructed in the nineteenth century, stands as the only officially recognized heritage site in the immediate vicinity. Online sources indicate that Leighton Hulett and members of the Hulett family were the first to develop the area, establishing a holiday residence in what was then wilderness in 1954. According to La Cock and Burkinshaw, the region remained largely undeveloped in 1960, aside from a few holiday cottages. The excavation of the first canals took place in 1967, and by 1970 approximately 161 holiday homes had been built. Consequently, most of the existing built environment dates from very recent construction¹⁷⁴.



In the 2012 HIA, Hart conducted a comprehensive archaeological analysis of the Thyspunt area, identifying several significant archaeological resources (Figure 8-104). The previous studies showed that pre-colonial heritage within the study region was remarkably abundant—particularly within 300 meters of the high-water mark and across the open dune fields. Archaeological material was frequently encountered along the coast wherever ground surface visibility permitted. It is therefore reasonable to conclude that the actual number of archaeological sites on the affected properties likely exceeds those recorded during these surveys. The presence of shifting dunes and changing vegetation may have obscured many previously identified sites. Notably, the vegetated dunes located between the coastline and the headland bypass dune system are largely devoid of archaeological material.

Hart's 2012 field assessments and test excavations produced the following results:

- Middle Stone Age materials were broadly distributed on nearly all exposed palaeosols within the active dune system.
- Numerous Late Stone Age shell middens were identified within 300 meters of the coastline and in active dunes, with the highest concentrations found on the shoreline, especially near shallow bays on rocky shores and natural springs.
- Additional Late Stone Age middens were documented in the active dune fields between 700 meters and 2 kms inland; these sites remain remarkably intact despite the dynamic nature of their environment.
- The vegetated dune system lying between the coast (extending 300 meters inland) and the Oyster Bay dune field contains minimal archaeological material.
- The colonial-period heritage in the study area is limited. An abandoned farmhouse on farm 735 portion 2 is the only structure confidently dated to over 60 years old and thus protected under the NHRA's general provisions; it likely dates to the late 19th or early 20th century.
- A well-preserved complex of historical fish traps is located in the shallow bay below St. Andrews Cottage.
- The St. Andrews Shack is linked to a longstanding tradition of use by this notable Eastern Cape School.
- According to the National Shipwreck Register (SAHRA), three ships were wrecked in Thysbaai during the 19th century, most likely driven onto the rocks or beach.

Given the research conducted thus far, reliable insights into the distribution of archaeological sites can be drawn at this site. The area within 300 m of the rocky shoreline was densely populated and likely contains more than seventy percent of the archaeological sites in the study region. The shoreline provided pre-colonial communities with abundant resources, including sheltered bays and pools suitable for shellfish gathering, as well as ample fishing opportunities. Coupled with numerous freshwater springs along the coast, this locality was ideal for settlement by pre-colonial people. It is probable that there is a decrease in the frequency of pre-colonial sites adjacent to the beach at Thysbaai, as beaches were less appealing to pre-colonial populations compared to resource-rich rocky shorelines.

Archaeological material was relatively visible in the immediate coastal areas and open dune fields, densely vegetated regions represented a knowledge gap. This was addressed through an additional phase of work undertaken in 2011 under an excavation permit issued by SAHRA.(by Hart (2012))¹⁹⁴.

Palaeontology

The DFFE Screening report identifies the Thyspunt site to have “Very High” sensitivity as it contains palaeontological features with Low, Medium and High sensitivity (Figure 8-105).



Figure 8-105 – DFFE Screening Report -Thyspunt Palao Sensitivity

Thyspunt shares many palaeontological similarities with Bantamsklip regarding geological context. However, Thyspunt's expansive and deep dune field complex greatly increases the likelihood of uncovering Pleistocene-era fossils and archaeological sites beneath the dunes (Hart, 2012 as cited by Gibb, 2012).

The planned nuclear corridor at Thyspunt sits on top of a low coastal platform shaped by waves into durable, quartzite-rich sediments from the Nardouw Subgroup (upper TMG). This platform generally ranges between 4 to 8 meters above mean sea level (mamsl), reaching up to 10 mamsl, and is covered by a thin layer of late Cenozoic coastal sediments belonging to the Algoa Group. Some formations in the Algoa Group may contain moderate fossil deposits.

More significant are the recent Pleistocene palaeontological finds occasionally exposed by the shifting dunes. Fossil remains—including bones found on ancient soils alongside hyena coprolites—suggest hyenas were active during the Pleistocene. Extinct mammals such as *Pelorovis antiquus* (giant buffalo) have also been discovered, indicating that these fossils date back to the Pleistocene. Binneman noted a high occurrence of Middle Stone Age artefacts in wind-eroded areas of the dunes, some of which appear to be largely undisturbed¹⁹⁴.

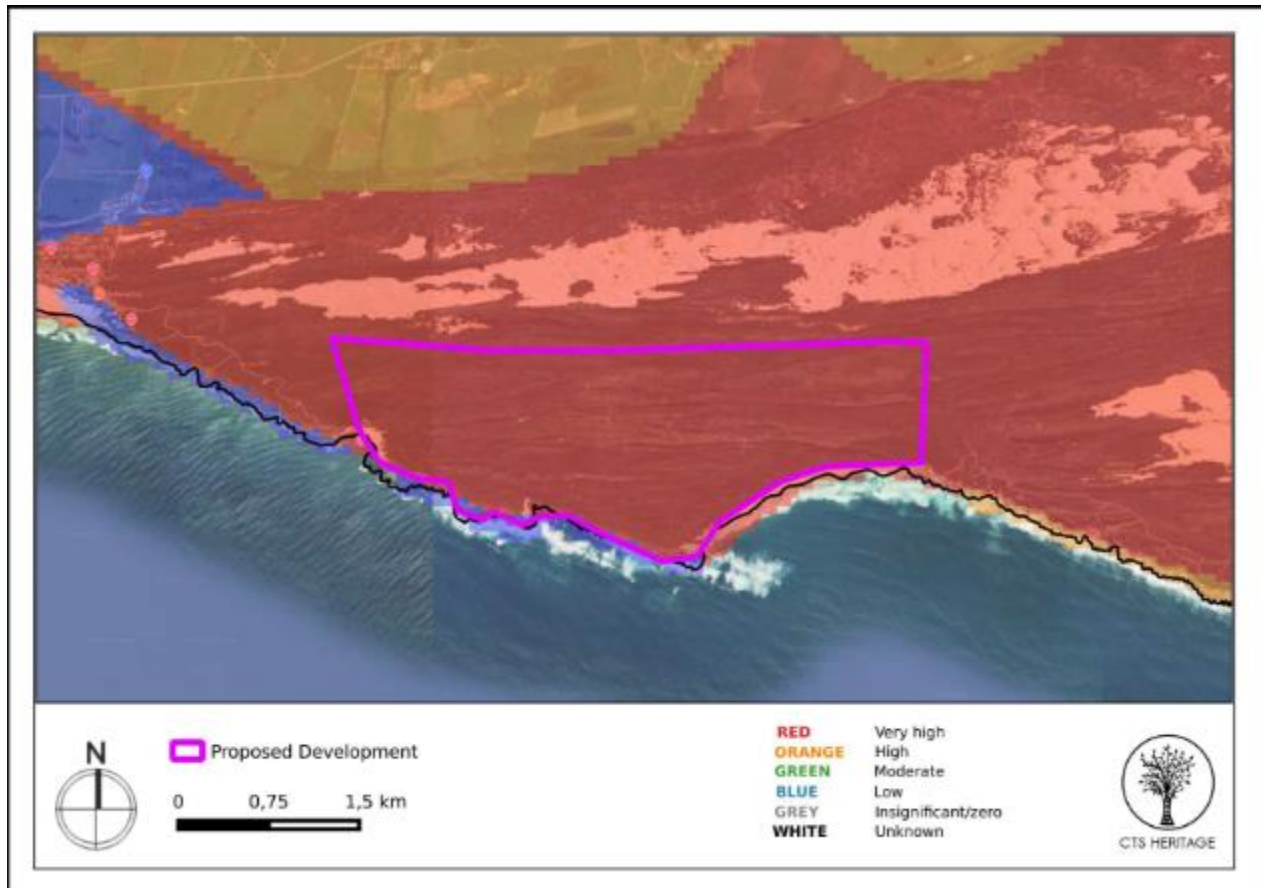


Figure 8-106 – Palaeosensitivity Map – Thyspunt. CTS, 2026

8.3.4 TOURISM

8.3.4.1 Bantamsklip

Tourism in the Bantamsklip region is primarily centred on nature-based and marine tourism activities. Key tourism activities include whale watching from nearby Hermanus, coastal hiking and eco-tourism, beach recreation, marine activities, and scenic driving routes along the coastline.

Hermanus hosts the internationally recognised Hermanus Whale Festival, which celebrates the annual arrival of Southern Right whales and attracts large numbers of domestic and international visitors (Western Cape Government, 2023).

Tourism infrastructure in the broader region includes hotels, guesthouses, eco-lodges, restaurants, and nature reserves, providing services and accommodation for visitors while facilitating access to the surrounding natural attractions.

The area is widely marketed as a pristine coastal and conservation-oriented destination, appealing to visitors seeking scenic landscapes, wildlife encounters, and relatively undeveloped coastal environments.

8.3.4.2 Thyspunt

Tourism in the Thyspunt region is largely nature-based and recreation-oriented, drawing visitors to the area's coastal landscapes and marine resources. Activities include surfing, beach recreation, whale and dolphin watching, boating, recreational fishing, hiking, and eco-tourism.

Nearby Jeffreys Bay is internationally recognised as one of the world’s premier surfing destinations and hosts the globally recognised World Surf League Jeffreys Bay Open, which attracts international visitors and media attention each year (World Surf League, 2024).

Seasonal tourism plays a particularly important role in the local economy. During peak holiday periods, visitor numbers increase substantially, with thousands of tourists visiting the area during the festive season (Eastern Cape Parks and Tourism Agency, 2022).

The tourism attractiveness of the region is largely driven by its scenic coastal landscapes, relatively low levels of industrial development, and the perception of a tranquil and natural coastal environment. Tourism infrastructure in the area includes guesthouses, holiday homes, small resorts, restaurants, and recreational facilities located primarily in St. Francis Bay, Jeffreys Bay, and surrounding coastal settlements

8.3.5 NOISE

The baseline noise information has been informed by WSP’s Acoustic Scoping Report¹⁹⁵ and relevant baseline information provided in Gibbs’ 2012 FEIR.

The current noise environment at both Bantamsklip and Thyspunt is mainly shaped by natural sounds from the ocean, wildlife, birds, and insects. Human-related noise sources include activity in nearby towns (Oyster Bay at the Thyspunt site and Pearly Beach at Bantamsklip), farming operations on neighbouring properties, and vehicles traveling along local roads.

8.3.5.1 Bantamsklip

Sensitive receptors are locations that could be affected by noise from the proposed project. Examples include schools, shopping centres, hospitals, office buildings, residential areas, and in remote locations, individual farmhouses and farmsteads. The Bantamsklip sites have specific receptors, which have been listed in Table 8-15 and presented in **Figure 8-107** below.

Table 8-15 – Sensitive receptors close to the Bantamsklip site. WSP, 2026

ID	Description	Latitude (°S)	Longitude (°E)
Rec 01	Edge of Pearly Beach Settlement	34.669115	19.520384
Rec 02	Kleyn Hagelkraal Farm	34.658928	19.540775
Rec 03	Farmstead	34.649672	19.559279
Rec 04	Farmstead	34.682917	19.563834
Rec 05	Buffeljachtsbaai Public Library	34.747578	19.607405

¹⁹⁵ Acoustic Scoping Report. WSP, 2026

The WSP Acoustic specialist team classified the Bantamsklip site as a “Low Sensitivity” site¹⁹⁵. This will be verified in the impact stage of the ESIR following baseline acoustic monitoring on site.



Figure 8-107 – Location of nearest sensitive receptors surrounding the Bantamsklip site.
WSP, 2026

8.3.5.2 Thyspunt

The proposed Thyspunt site is situated in a largely undisturbed green fields area that does not currently experience any significant external noise producing activity. The Nuclear infrastructure site would be located 4.2 km east of residential areas in Oyster Bay. Most homes are positioned on the slopes of dunes overlooking the coastline, where residents are exposed to surf noise with $L_{Req,d}$ levels exceeding 50 dBA, depending on proximity to the shoreline. An $L_{Aeq,T}$ measurement of 43 dBA was recorded behind the dune along the road to Umzamowethu township, with distant surf as the sole audible sound.

A green rectangle marks the previously proposed location for the High Voltage (HV) yard, which was intended for two Open Cycle Gas Turbine (OCGT) peaking power plants with a combined capacity of 50 MW. The current proposal situates the HV yard within the construction substation area on-site. Green circles indicate the nearest farm residences; one residence lies just beyond the HV yard boundary, while the other two are approximately 1,000 meters from the proposed HV yard. The typical $L_{Req,d}$ for these farm residences is 45 dBA.

Study of elevation contours revealed that terrain near the proposed Duynefontyn site is comparable to that at Thyspunt, particularly regarding its effect on inland noise propagation. The largely flat topography extending at least 750 meters around both sites is expected to have minimal impact on noise transmission away from the sources.

Sensitive receptors

The Thyspunt sites have specific receptors, which are listed in Table 8-16 below and presented as Figure 8-108. It is noted that identification of these receptors is purely desktop based, and it is assumed that all key receptors have been included here.

It is noted that Rec 03 – Rec 11 for the Thyspunt site are residences that are currently on leased properties from Eskom. When construction of the NPP commences, these leases will expire and the residents will move out. Hence, these receptors are not considered sensitive and impacts on these receptors will not be assessed in the EIA phase.

Table 8-16 – Sensitive receptors close to the Thyspunt site. WSP, 2026

ID	DESCRIPTION	LATITUDE (°S)	LONGITUDE (°E)
Rec 01	Oyster Bay Beach Lodge	34.175656	24.663942
Rec 02	Residence	34.176563	24.666163
Rec 03*	Residence	34.178433	24.675831
Rec 04*	Residence	34.181544	24.678729
Rec 05*	Residence	34.182653	24.684926
Rec 06*	Residence	34.187898	24.701110
Rec 07*	Residence	34.188469	24.704155
Rec 08*	Residence	34.191750	24.713754
Rec 09*	Residence	34.186683	24.737553
Rec 10*	Residence	34.179943	24.734880
Rec 11*	Residence	34.179709	24.736329
Rec 12	Farmhouse	34.150667	24.743590
Rec 13	Farmhouse	34.153830	24.715764
Rec 14	Farmhouse	34.156094	24.687863
Rec 15	Farmhouse	34.155180	24.676707
Rec 16	Edge of Oyster Bay Settlement	34.166623	24.664484

* These residences are currently on leased properties from Eskom. When construction of the NPP commences, these leases will expire as the lease conditions excludes occupation once construction starts. Hence, these receptors are not considered sensitive and impacts on these receptors will not be assessed in the EIA phase.

The WSP Acoustic specialist team classified the Thyspunt site as a “Medium Sensitivity” site¹⁹⁵. This will be verified in the impact stage of the ESIR following baseline acoustic monitoring.



Figure 8-108 – Location of nearest sensitive receptors surrounding the Thyspunt site. WSP, 2026

8.3.6 TRANSPORT AND TRAFFIC

The information sourced for baseline transport and traffic information has been sourced from Innovative Transport Solutions (ITS) Bantamsklip and Thyspunt Nuclear PPP Scoping Report¹⁹⁶¹⁹⁷.

8.3.6.1 Bantamsklip

Bredasdorp lies 57 km northeast of the site. Nearby coastal towns with low, seasonally increased populations include Pearly Beach (15 km west) and Gansbaai (32 km west). Inland areas are mainly agricultural. Regional hubs are Hermanus (northwest), Swellendam (northeast), and Caledon (north). The road network within ~50 km of the site is dominated by the N2 (national), R43, R316, R326 and R317 (provincial). The Bantamsklip site can be accessed via the surrounding provincial road network. Except for the R317, which is gravel, all other provincial roads are surfaced and

¹⁹⁶ Traffic Impact Assessment Status Quo, Bantamsklip. ITS, 2026

¹⁹⁷ Traffic Impact Assessment Status Quo, Thyspunt. ITS, 2026

regularly maintained by the relevant road authorities. The existing road network and possible link roads to the site are illustrated in Figure 8-109 below.



Figure 8-109 – Existing Road Links, ITS, 2023

Site access

Access to the road network serving Bantamsklip is facilitated via the N2 at Caledon. The N2 is a paved national route typically configured as a single carriageway with traffic lanes approximately 3.5 meters wide and paved shoulders measuring 2.0 meters. Sections approaching various settlements feature intermittent overtaking lanes in alternating directions, enhancing passing opportunities. At key intersections, including access points to the area, the N2 is channelized with dedicated left- and right-turn lanes to support turning movements and optimize traffic flow and safety. The road surface of the N2 meets current demand and operational requirements and is maintained to a high standard with no visible cracks¹⁹⁶.

The R43 is a paved route with one lane in each direction. Shoulder widths vary along its length, generally ranging from 0.5 meters to 1.2 meters between Hermanus and the Bantamsklip site. Each lane measures 3 m in width. The approach to Bantamsklip on the R43 exhibits inconsistent standards, with notable differences in surface quality, shoulder provision, and road markings.

The R316 is paved with one lane per direction, featuring lanes that are 3 meters wide and shoulders measuring 1.2 meters. The road is in excellent condition. The R326 is also paved with single lanes in each direction, with lanes 3 meters wide and no shoulder provision. The road is in good condition.

The R317 is an unpaved gravel road, approximately 8.5 m wide, lacking both shoulders and road markings. Its overall condition is good¹⁹⁶.

Traffic

SANRAL CTO stations indicate relatively low growth and modest peak hour volumes for this area.

Site Access

Access to the site is possible directly off the R43 (Figure 8-110).



Figure 8-110 – Possible Site Access – Bantamsklip. ITS, 2026

8.3.6.2 Thyspunt

Humansdorp is 15 km north of the site, with nearby coastal towns like St Francis Bay (5 km east) and Oyster Bay (7 km west). These towns have low population density, with seasonal tourism peaks. Inland areas are mainly agricultural. Oyster Bay Wind Farm and Kouga Wind Farm are about 5 km northwest of the proposed development.

Road network

The N2 is an east-west route connecting major eastern coastal cities like Gqeberha, George, and Cape Town

It links with the N7 in Cape Town. Access from Thyspunt to the N2 is via Humansdorp along the R330 or Oyster Bay Road. The R330 is a paved road heading south from Humansdorp past St. Francis Bay to Seal Point. The existing unpaved road from Humansdorp to Oyster Bay remains in good condition during dry seasons but needs more maintenance when wet.

The road network within ~50 km of the site is dominated by the N2 (national), R102 and R330 (provincial) (**Figure 8-111**). The Thyspunt site can be accessed via the surrounding provincial road network. The provincial roads are unsurfaced and require regular maintenance by the relevant road authorities. The existing road network

The N2 is a rural National Road with 2.0 m shoulders and 3.7 m lanes; its surface is well maintained with no visible cracks. The R102 has one lane in each direction and 2.0 m shoulders near Humansdorp town, with lanes 3.5 m wide. The section leading to the Oyster Bay access road is 7 m wide without shoulders and is in poor condition, featuring surface cracks, uneven patches, and potholes. The R330 has 3.5 m wide lanes with no shoulders and is generally in good shape, though some intersections near Cape St Francis have uneven surfaces¹⁹⁷.



Figure 8-111 – Surrounding Routes -Thyspunt. ICS, 2026

Traffic Volumes

SANRAL CTO stations and private traffic counts indicate relatively low growth and modest peak hour volumes in this area.

Rail network

There are no passenger or freight rail services available in the vicinity. The existing narrow-gauge railway line through Humansdorp has been out of service for many years.

Historically, there were two railway services operating on the railway lines operating between Alicedale and Grahamstown, and Port Alfred and Bathurst¹⁷⁴.

Airports

The Chief Dawid Stuurman International Airport in Gqeberha serves as the primary air gateway to the Cacadu District. The Ndlambe Municipality hosts an airfield suitable for light aircraft, utilized by a private company for pilot training and private landings. Additional facilities accommodating light aircraft are located in St Francis Bay and Paradise Beach. Currently (2026), the airfield in Humansdorp is not operational¹⁹⁷.

Harbours

The nearest harbour is about 14 km east at Port St. Francis, a small private fishing and recreational facility. Main sea access for Cacadu District is through the national harbour at Gqeberha in Nelson Mandela Metropolitan, with Coega harbour serving important regional roles. Private developers have also built small boat harbours at Port Alfred and Port St. Francis, mainly for commercial and recreational use¹⁹⁷.

8.3.7 WATER SUPPLY

This section has been informed by SRK's Specialist Water Supply Scoping report¹⁹⁸.

8.3.7.1 Bantamsklip

The Bantamsklip site is located within the Breede WMA in the Overstrand Municipality, which has eight water schemes supplying some 130 000 residents (Overstrand Municipality, 2025 as cited by SRK, 2026). The Overstrand Municipalities water supply sources include rivers, dams, boreholes and springs. the site falls under ward 11, Baardkeedersbos, Pearly Beach, Buffelfagsbaai and Franskraal¹⁹⁸.

Eskom previously concluded that any major industrial undertaking in this area would require the supply of fresh water by pipeline from a major source outside of the immediate region. The nearest such system the Riviersonderend/Breë.

Groundwater supply

The groundwater potential near the proposed site is considered to be low. Exploration boreholes were drilled at Pearly Beach and Buffelsjag in the early 1990s for town supply but were unsuccessful. Figure 8-112 illustrates the location of the boreholes in the immediate area.

Water Supply Alternatives

Desalination at the Bantamsklip is considered a reliable and cost-effective method to provide an assured water supply to the site¹⁹⁸.

¹⁹⁸ Specialist Water Supply Scoping Report_619638. SRK, 2026

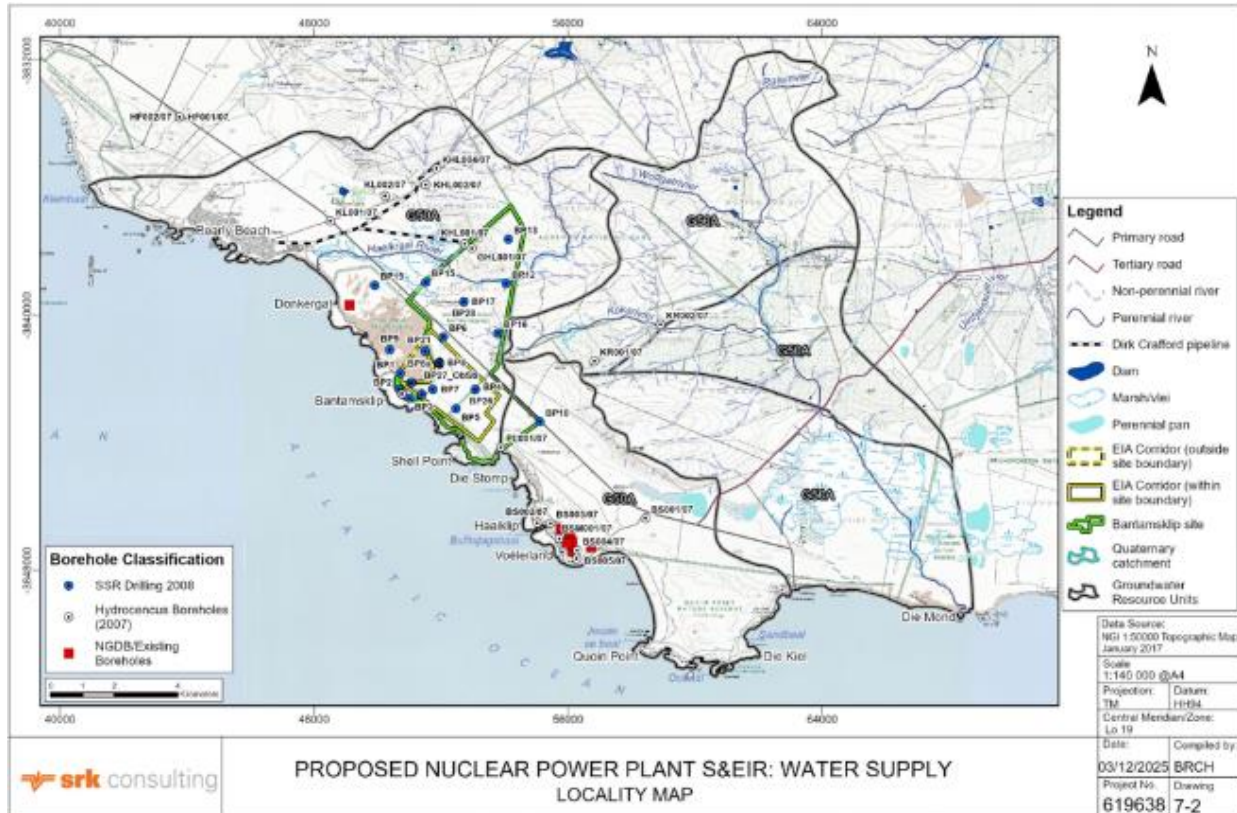


Figure 8-112 – Bantamsklip Borehole Locality Map. SRK, 2026

8.3.7.2 Thyspunt

The freshwater supply study for Thyspunt in 2016, noted that:

- Groundwater was widely used in the area.
- Coastal springs existed at the site.
- Local towns received water from Churchill and Impofu Dams and groundwater sources.
- There was potential to further develop local groundwater for construction needs on-site and nearby.
- Surface water resources were stressed; additional withdrawals for an NPS would worsen this.
- Importing water from the Orange River Scheme was considered the best surface water option with the least impact, as concluded in the 2016 EIR.
- Surface water, and to a lesser extent groundwater, could have been negatively impacted by climate change.
- Desalination was regarded as the most reliable and environmentally friendly water supply option for this proposed development and was (in previous assessments) and still was Eskom's preferred choice.

Water supply Governance

DWS govern water use for the municipal initiatives in this region.

Existing Water Supply

The site falls within the Fish-Tsitsikamma Water Management Area (WMA) but large quantities of water are imported from the Gariep Dam in the Upper Orange River WMA via the Sundays River

and the Nooitgedacht Water Supply Scheme (Nelson Mandela Bay Municipality, 2021 as cited by SRK, 2026)¹⁹⁸.

The greatest use of water in the area is for irrigation, being about 55% of total use. According to the water requirement projections outlined in (Nelson Mandela Bay Municipality, 2021), no allowance has been made for any possible water requirements for power generation in the Fish-Tsitsikamma WMA¹⁹⁸.

The Nelson Mandela Bay Municipality (NMBM) provides water to Humansdorp and St. Francis Bay through the Churchill Pipeline, which draws from the Churchill and Impofu (formerly Elandsjagt) dams. These dams hold 26.3 and 32.1 million cubic meters of water, respectively, and are part of the Western System. The NMBM owns the Churchill Dam, while the Impofu Dam and other dams supplying the Central and Eastern Systems belong to the Department of Water and Sanitation (DWS). When unrestricted, the Western System delivers a bulk supply of 167 million liters per day.

Oyster Bay, managed by the Kouga Local Municipality (KLM), depends entirely on groundwater. Three boreholes were established in late 2017 and two more in late 2018 (Murray, 2020), and as of 2024, the town receives water from sources listed in Table 8-17, the location of which is illustrated in Figure 8-113¹⁹⁸.

Table 8-17 – Oyster Bay Groundwater Sources. SRK, 2026

SOURCE	LAT.	LONG.	DEPTH (M)	YIELD (L/S)
Springs	-34.17374	24.66241	-	1.72
Otto Borehole			-	0.80
GWA-OB2-2017	-34.16227	24.66768	219	0.70
GWA-OB3-2017	-34.17289	24.66130	157	1.30
GWA-OB4-2018	-34.17106	24.65556	271	2.00
GWA-OB5-2018	-34.16584	24.65600	290	0.70
BH1	-34.17146	24.66132	-	2.00

There is a strong coastal spring yielding 8 liters per second west of Cape St. Francis at Mostert's Hoek, currently occasionally used. Small seeps and springs occur frequently along the coast at the base of the Algoa Group, but no large springs exist near or on the NPP site. Most of these seeps and springs flow directly onto rocks or sandy beaches, emptying straight into the ocean¹⁹⁸

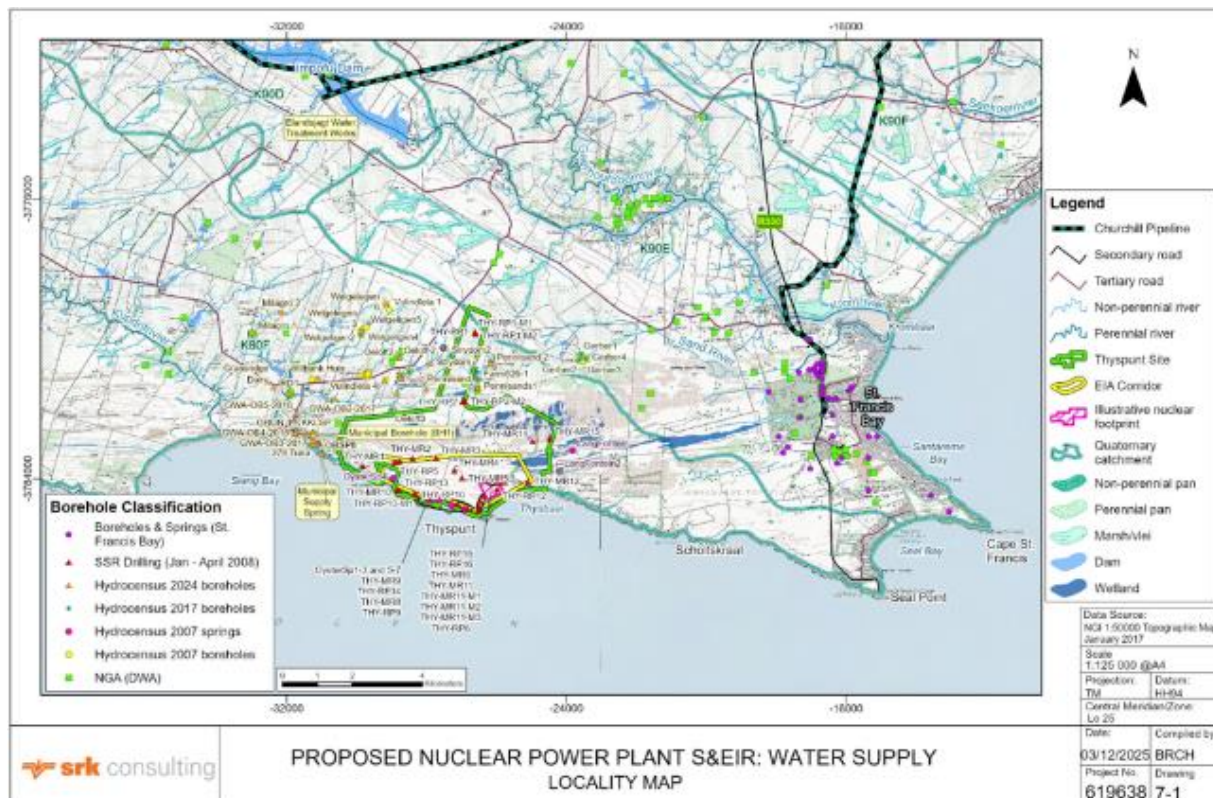


Figure 8-113 – Water Supply Map – Thyspunt. SRK, 2026

Potential Water Supply

The estimated annual freshwater demand for the full NPP development is about 5.45 Mm³. This represents a significant volume for the local water supply in the local area¹⁹⁸.

Potential Water supply Infrastructure

The Churchill Pipeline to St. Francis Bay has a design capacity of 93 L/s, which could possibly be increased to a maximum of about 120 L/s (Nelson Mandela Bay Municipality, 2021)¹⁹⁸.

Potential Groundwater

The potential for groundwater use at the site for the construction phase is considered to be feasible, “good”. Flow modelling performed for the site indicated that up to 30 L/s could be abstracted from both the Algoa Aquifer (13 L/s) around borehole THY-MR11 and TMG Aquifer (17 L/s), from scattered boreholes, under dry climatic conditions¹⁹⁸. Eskom intends to use 17.4 to 23.1 L/s of water for the Site Establishment period of approximately one year prior to commissioning of a permanent desalination plant which could be obtained from existing site groundwater sources at Thyspunt¹⁹⁸.

Water supply Alternatives

Additional sources of fresh water supply could include the construction of new dams, the acquisition and consolidation of existing water use licenses or allocations, as well as the utilization of treated wastewater and stormwater runoff from the site. However, none of these options are presently regarded as viable for ensuring a sufficient and reliable supply¹⁹⁸.

Considering the water scarcity of this area, the periodic droughts experienced here, ground water environmental impact, the only other viable water supply option is the use of desalinated seawater.

There is a ready supply of seawater at the site and there will be a ready supply of power once the NPP is in operation to run a desalination plant¹⁹⁸.

8.3.8 HEALTH RISK

Baseline population health input has been included from the Infotox Scoping and Baseline Health Assessment Report for the Rapid Appraisal Health Impact Assessment of PM2.5 from the Proposed Construction and Operation of the Eskom Nuclear Power Plant at Thyspunt¹⁹⁹ and Bantamsklip²⁰⁰. The baseline health status of exposed communities serves as an important factor in the evaluation of potential health impacts that a nuclear development could have in an area. This was determined through a desktop analysis of available health data for the receptor areas, offering insight into the existing burden of disease within the RAHIA and identifying specific vulnerabilities that may affect health outcomes related to the proposed operations¹⁹⁹.

8.3.8.1 Bantamsklip

The baseline health status of exposed communities is a key factor in assessing health impacts. This was determined through a desktop review of existing health data for the receptor area, which highlighted disease burdens and specific vulnerabilities relevant to the RAHIA. Mortality data from the Western Cape and Overberg DM were analysed to assess population vulnerability to PM2.5 emissions from NPP construction and operations.

Age influences vulnerability: children under 15 and adults over 65 are generally more susceptible to air pollutants. For children, there is some cardiovascular but not respiratory vulnerability. No increased vulnerability is evident in those over 65. In Ward 11—covering the study area and with over 30% of residents aged 65+²⁰⁰.

8.3.8.2 Thyspunt

Mortality rates in the Eastern Cape province and Sarah Baartman District Municipality were reviewed to assess the susceptibility of the receptor population to health effects from PM2.5 emissions associated with NPP construction and operation.

Age was recognized as a key determinant of vulnerability; younger children (under 15 years old) and older adults (aged 65 and above) are particularly at risk of adverse health effects from air pollutants. Without age differentiation, receptor communities demonstrate moderate vulnerability to the cardiovascular and respiratory impacts of PM2.5.

The under-15 age group exhibits a slight increase in susceptibility to these effects. For older individuals (65+), elevated vulnerability to cardiovascular effects was not observed, though moderate susceptibility to respiratory issues is evident. This vulnerability is especially pronounced in Ward 12, situated on the northeastern perimeter of the 10-km radius local study area, where more than 40% of residents are aged 65 or older, compared to only 4% in Ward 1, which represents the primary portion of the study area¹⁹⁹.

¹⁹⁹ Infotox Baseline Health Assessment for Thyspunt – 2026. Report No 005-2026 Rev 1.0.

²⁰⁰ Infotox Baseline Health Assessment for Bantamsklip – 2026. Report No 006-2026 Rev 1.0

9 SITE SENSITIVITIES VERIFICATION

Specialist assessments were conducted in accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes, which were promulgated in Government Notice No. 320 of 20 March 2020 and in Government Notice No. 1150 of 30 October 2020 (i.e. “the Protocols”), or Appendix 6 of the EIA Regulations, depending on which legislation apply to the assessment under consideration.

A summary of the DFFE Screening Tool reports, the applicable legislation as well as the specialist sensitivity verifications are detailed for the Thyspunt and Bantamsklip sites in Table 9-1 and Table 9-2 respectively. The comprehensive Site Sensitivity Verification Report (SSVR) for the Scoping Phase is included in **Appendix I**.

Table 9-1 – Assessment Protocols and Site Sensitivity Verifications – Thyspunt

SPECIALIST ASSESSMENT	ASSESSMENT PROTOCOL	DFFE SCREENING TOOL SENSITIVITY	SPECIALIST SENSITIVITY VERIFICATION
Agricultural Impact Assessment	Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) of 4 NEMA, 1998).	Very High Sensitivity	Because the site is not suitable for viable crop production, its true sensitivity, as assessed on the ground, is medium. This assessment therefore disputes the very high sensitivity classification of the site by the screening tool and verifies the entire site as being of medium agricultural sensitivity because of its assessed cropping potential.
Landscape/Visual Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool	
Archaeological and Cultural Heritage Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	Very High Sensitivity	The results of the DFFE Screening Tool indicated that the Heritage theme has a Very High Sensitivity, and the specialist confirms this.

SPECIALIST ASSESSMENT	ASSESSMENT PROTOCOL	DFFE SCREENING TOOL SENSITIVITY	SPECIALIST SENSITIVITY VERIFICATION
Palaeontology Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	Very High Sensitivity	The results of the specialist's desktop study indicated that the proposed site has Low to medium Sensitivity. While the Algoa Group coastal formations are known regionally to preserve marine and terrestrial fossils, surface exposures within the development area are limited and disturbed, and no fossil material was recorded. As a result, the likelihood of encountering scientifically significant fossil material during construction is considered low. Ground-disturbing activities associated with the proposed development therefore present a low risk to palaeontological heritage resources, although a residual possibility of chance fossil discoveries remains during deeper excavations into subsurface sediments.
Terrestrial Biodiversity Impact Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity where the site of the proposed activity is identified as very high sensitivity for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) of 4 NEMA, 1998).	High Sensitivity	Thyspunt is an environmentally complex coastal system dominated by extensive dune landscapes (including large transverse mobile-dune fields) and an associated mosaic of seasonal wetlands that are strongly linked to groundwater dynamics; these ecological processes are highly sensitive to disturbance and fragmentation. Therefore, the sensitivity is verified as very high.
Aquatic Biodiversity Impact Assessment	Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020)) provides the criteria for the assessment and reporting of impacts on aquatic biodiversity for activities requiring environmental authorisation.	Very High Sensitivity	The site is classified as Very High Sensitivity due this area being rated as a (surface water) Strategic Water Source Area (SWSA). What the Screening Tool data do not however reference is the presence of the extensive wetlands within and hydrologically connected to the site, which should also have informed the Very High Sensitivity rating, and should in fact have driven this rating to extend along the coast. The Site Sensitivity map is thus partially confirmed – the Very High Sensitivity areas from an aquatic biodiversity perspective should extend to the coastline in at least areas where coastal seep wetlands have been mapped.
Civil Aviation Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on civil aviation installations	Medium Sensitivity	Low Sensitivity The relevant stakeholders i.e. CAA and ATNS have been included on the project database.

SPECIALIST ASSESSMENT	ASSESSMENT PROTOCOL	DFFE SCREENING TOOL SENSITIVITY	SPECIALIST SENSITIVITY VERIFICATION
Defence Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on civil aviation installations	Low Sensitivity	Low Sensitivity
Noise Impact Assessment	Protocol for specialist assessment and minimum report content requirements for noise impacts	No sensitivity identified by the screening tool	
Traffic Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool	
Geotechnical Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool	
Socio Economic Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool	
Plant Species Assessment	Protocol (Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, gazetted on 30 October 2020), provides the criteria for the assessment and reporting of impacts on plant and animal species for activities requiring environmental authorisation.	High Sensitivity	The Thyspunt site has HIGH sensitivity with respect to the Plant Species Theme - Confirmed habitat for SCC, listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria. These areas are unsuitable for development due to a very likely impact on SCC.

SPECIALIST ASSESSMENT	ASSESSMENT PROTOCOL	DFFE SCREENING TOOL SENSITIVITY	SPECIALIST SENSITIVITY VERIFICATION
Animal Species Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) of 4 NEMA, 1998), provides the criteria for the assessment and reporting of impacts on plant and animal species for activities requiring environmental authorisation.	High Sensitivity	The results DFFE Screening Tool indicated that the Animal Species theme has a High Sensitivity due to the potential presence of due to the presence of species (those identified in the screening report and the additional species identified from the literature review) that are likely to occur within the Project area. However, this result was disputed by the specialist who confirmed that the site has Low to High Sensitivity due to the possible presence of protected species.
Noise Impact assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool.	

Table 9-2 – Assessment Protocols and Site Sensitivity Verifications – Bantamsklip

SPECIALIST ASSESSMENT	ASSESSMENT PROTOCOL	DFFE SCREENING TOOL SENSITIVITY	SPECIALIST SENSITIVITY VERIFICATION
Agricultural Impact Assessment	Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) of 4 NEMA, 1998).	High Sensitivity	Because the site is not suitable for viable crop production, its true sensitivity, as assessed on the ground, is low. This assessment therefore disputes the high sensitivity classification of the site by the screening tool and verifies the entire site as being of low agricultural sensitivity because of its assessed cropping potential.
Landscape/Visual Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool	

SPECIALIST ASSESSMENT	ASSESSMENT PROTOCOL	DFFE SCREENING TOOL SENSITIVITY	SPECIALIST SENSITIVITY VERIFICATION
Archaeological and Cultural Heritage Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	High Sensitivity	The results of the DFFE Screening Tool indicated that the Heritage theme has a High Sensitivity, and the results of the specialist's desktop study confirmed this.
Palaeontology Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	Very High Sensitivity	The results of the DFFE Screening Tool indicated that the Palaeontological theme has a Very High Sensitivity, and the results of the specialist's desktop study indicated that the proposed site has Low sensitivity. While the Bredasdorp Group coastal formations are known regionally to preserve marine and terrestrial fossil material, surface exposures within the development area are limited, vegetated, and locally disturbed, and only sparse, fragmentary shelly invertebrate material of limited scientific significance was recorded. No vertebrate fossils, trace fossil assemblages, or fossil-rich contexts were identified. As a result, the likelihood of encountering scientifically significant fossil material during construction is considered low. Ground-disturbing activities associated with the proposed development therefore present a low risk to palaeontological heritage resources, although a residual possibility of chance fossil discoveries remains during deeper excavations into subsurface sediments or calcretised horizons.
Terrestrial Biodiversity Impact Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity where the site of the proposed activity is identified as very high sensitivity for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment. gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) of 4 NEMA, 1998).	Very High Sensitivity	The results DFFE Screening Tool indicated that the Terrestrial Biodiversity theme has a Very High Sensitivity, and the results of the specialist's desktop study confirmed this.

SPECIALIST ASSESSMENT	ASSESSMENT PROTOCOL	DFFE SCREENING TOOL SENSITIVITY	SPECIALIST SENSITIVITY VERIFICATION
Aquatic Biodiversity Impact Assessment	Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation (GN 320, 20 March 2020)) provides the criteria for the assessment and reporting of impacts on aquatic biodiversity for activities requiring environmental authorisation.	Very High Sensitivity	The results DFFE Screening Tool indicated that the Aquatic Biodiversity theme has a Very High Sensitivity due to the area including Aquatic Critical Biodiversity Areas (CBAs) as well as (surface water) Strategic Water Source Areas (SWSAs). In fact, the SWSA data show that the SWSA in the Bantamsklip site area is in fact a groundwater and not a surface water source. However, the area north of the R43 does indeed include extensive wetlands warranting the inclusion of at least that part of the site in the Very High Sensitivity layer of the Screening Tool. No CBA wetlands have been mapped in the Bantamsklip survey area, although the Haelkraal wetland, north-west of the site and immediately upstream of the estuary, has been mapped as a CBA wetland in the 2023 Western Cape Biodiversity Spatial Plan (WCBSP) of 2023. The Site Sensitivity is thus partially confirmed – the Very High Sensitivity areas from an aquatic biodiversity perspective should extend north of the R43 only, in the vicinity of the site itself.
Civil Aviation Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on civil aviation installations	High Sensitivity	Low Sensitivity The relevant stakeholders i.e. CAA and ATNS have been included on the project database.
Defence Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on civil aviation installations	Low Sensitivity	Low Sensitivity
Noise Impact Assessment	Protocol for specialist assessment and minimum report content requirements for noise impacts	No sensitivity identified by the screening tool	
Traffic Impact Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool	
Geotechnical Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool	

SPECIALIST ASSESSMENT	ASSESSMENT PROTOCOL	DFFE SCREENING TOOL SENSITIVITY SPECIALIST SENSITIVITY VERIFICATION	
Socio Economic Assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool	
Plant Species Assessment	Protocol (Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, gazetted on 30 October 2020), provides the criteria for the assessment and reporting of impacts on plant and animal species for activities requiring environmental authorisation.	Medium Sensitivity	The results DFFE Screening Tool indicated that the Plant Species theme indicated Medium Sensitivity. The specialist confirms the medium sensitivity with respect to the Plant Species Theme - Suspected habitat for SCC based either on there being records for this species collected in the past, prior to 2002, or being a natural area included in a habitat suitability model
Animal Species Assessment	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) of 4 NEMA, 1998), provides the criteria for the assessment and reporting of impacts on plant and animal species for activities requiring environmental authorisation.	High Sensitivity	The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas, being ranked Low to high sensitivity.
Noise Impact assessment	Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.	No sensitivity identified by the screening tool.	

9.1 CONSOLIDATED SITE SENSITIVITY

Figure 9-1 and Figure 9-2 below illustrate the consolidated site sensitivities for the scoping phase with the preliminary layouts overlain. The sensitivity inputs and findings from all of the appointed specialists have been combined and utilised to prepare these maps.

These sensitive areas identified will be utilised going forward into the EIA phase in order to plan and further refine the layout of the NPP development to avoid sensitive areas accordingly and minimise the impacts of the proposed project on in the area.

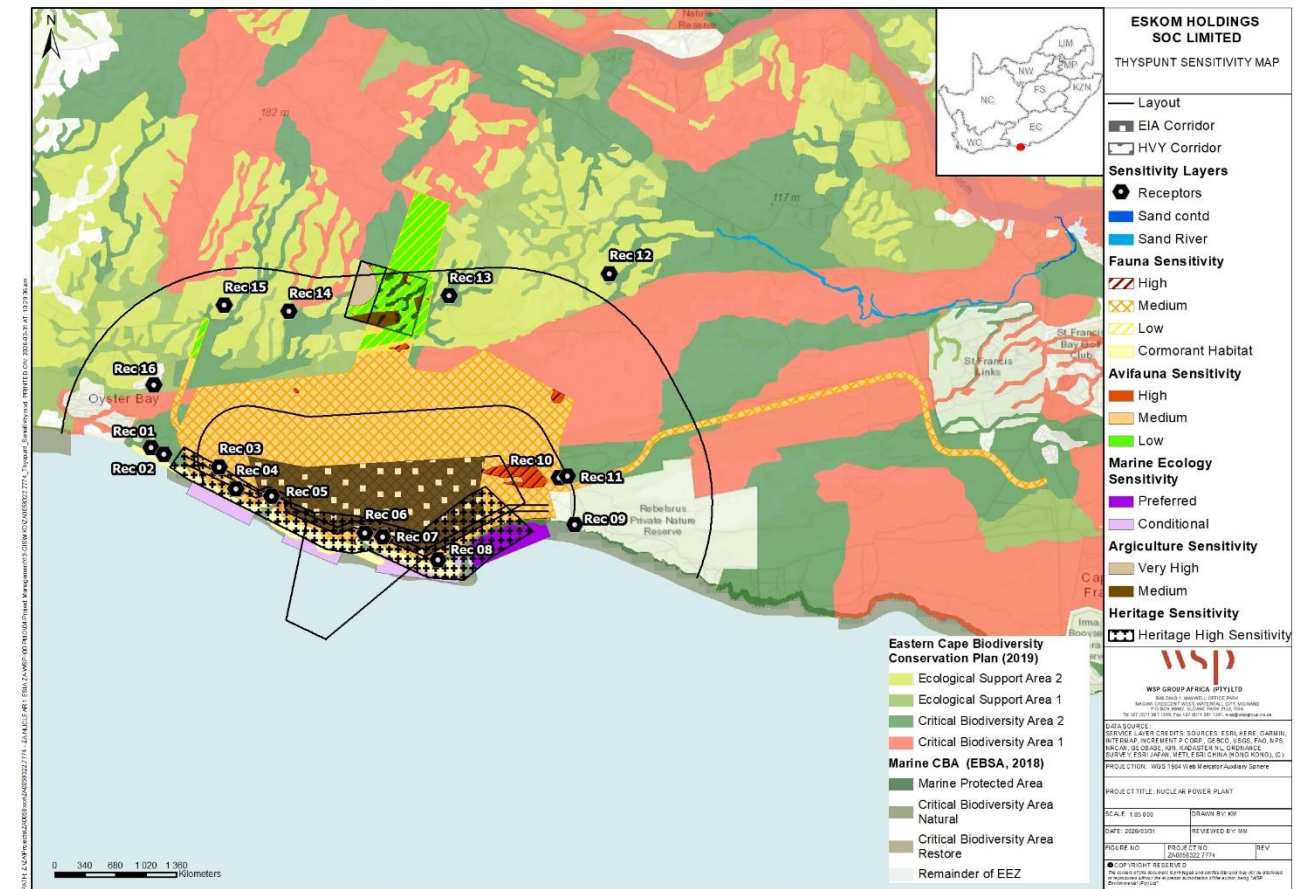


Figure 9-1 – Consolidated Sensitivity Map overlain by the Preliminary Site Layout for Thyspunt

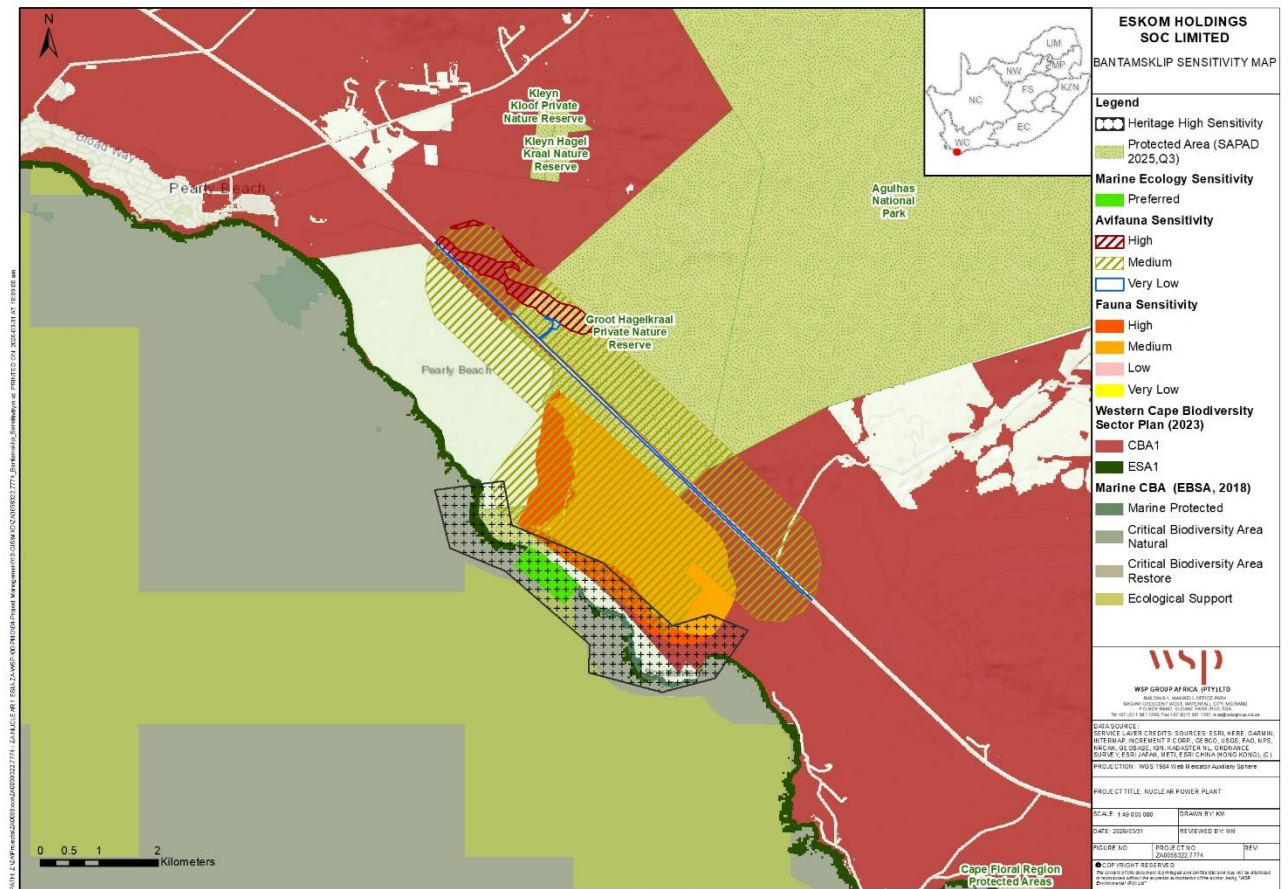


Figure 9-2 – Consolidated Sensitivity Map overlain by the Preliminary Site Layout for Bantamsklip

10 POTENTIAL IMPACTS

10.1 IDENTIFICATION OF POTENTIAL IMPACTS

The aim of the scoping phase of the S&EIR process is to identify potential impacts that are most likely to be significant, requiring assessment as part of the S&EIR process. The determination of anticipated impacts associated with the proposed development is a key component to the S&EIR process. This chapter identifies the anticipated environmental and social impacts associated with the proposed NPP project.

The issues identified stem from those aspects presented in **Chapter 8: Description of Baseline Environment** and the description of project components and phases as outlined in **Chapter 4: Project Description**. Each significant issue identified is to be investigated further during the S&EIR process. Non-significant issues will be scoped out of the study with reasonable consideration given within the Scoping Report.

The potential environmental and social impacts of the proposed NPP have been identified at a high level and are discussed in **Section 10.3**, including the impact significance assessment ratings. These impacts, and mitigation measures will be further assessed during the EIA Process.

*It must be noted that the mitigation measures outlined in the tables under **Section 10.3** are preliminary mitigation measures suggested at this stage. They do not constitute final recommendations, and further investigation is required during the EIA phase.*

This section includes a comparative assessment of impacts across both Thyspunt and Bantamsklip, with all specialist studies applying a consistent methodology, impact criteria, and significance ratings to ensure an equitable and unbiased evaluation of alternatives.

10.2 PHASE OF DEVELOPMENT

Potential impacts have been identified and preliminarily assessed according to the phases of the project's development. For the purpose of this project, these phases have been generically defined in **Table 10-1**.

Table 10-1 – Key activities associated with project phases

PHASE	COMPONENTS	KEY ACTIVITIES
Construction The construction phase includes the preparatory works/activities typically associated with the creation of surface infrastructure, access and electrical power.	Site Preparation	- Land clearing and excavation - Soil stabilisation and foundation work - Access roads - Site fencing and security infrastructure - Utilities (water, electricity, communications) - Construction laydown and material storage areas

PHASE	COMPONENTS	KEY ACTIVITIES
	Civil Engineering and Structural Works	- Reactor containment buildings - Turbine halls and auxiliary buildings - Specialised shielding structures - Hydrogen production plant buildings - Desalination plant buildings - Office buildings, control room and administrative facilities - Workshops, warehouses and maintenance facilities
	Mechanical and Electrical Installations	- Reactor vessel installation - Steam generators, turbines, condensers and auxiliary systems - Electrical systems including HV yard, transformers and grid connections - Cooling systems including pumps, heat exchangers and sea water intake/outflow channels or pipelines - Hydrogen production equipment (electrolysers, compressors, storage vessels) - Desalination process equipment - Sewage treatment plant mechanical equipment and sludge handling systems - Potable and process water treatment and storage facilities
	Safety and Control Systems	- Emergency core cooling systems - Instrumentation and control systems - Central and satellite control room systems - Backup power systems (including diesel and gas storage) - Fire protection and fire-water systems - Safety, alarm and access control systems
	Fuel Handling and Storage Facilities	- Spent fuel pools - Dry storage - Fresh fuel handling
	Testing and Quality Assurance	- Hydrostatic and pressure testing - Electrical and control system verification - Safety audits
	Commissioning Activities	- Cold/hot commissioning - Grid synchronisation
Operation The operational phase includes the daily activities associated with the NPP.	Reactor Operation	- Startup and shutdown procedures - Control rod adjustment - Continuous monitoring
	Fuel Cycle Management	- Fuel loading and unloading - Spent fuel storage (wet and dry) - Fuel efficiency optimisation

PHASE	COMPONENTS	KEY ACTIVITIES
	Water Supply and Desalination	- Operation of desalination plant including intake and outfall systems - Operation of raw, potable, and process water storage facilities, including treatment plants - Monitoring of water quality and volumes
	Cooling Water and Heat Rejection Systems	- Management of cooling water intake and discharge - Monitoring of thermal performance and environmental compliance
	Electrical Systems and Grid Interface	- Operation of HV yard, substations, and transformers - Power export to the grid - Load management and system protection - Routine inspection and testing of electrical infrastructure
	Maintenance Activities	- Preventive maintenance - Corrective maintenance - Predictive maintenance
	Safety and Emergency Preparedness	- Emergency core cooling systems - Backup power systems - Radiation protection monitoring - Fire detection and fire-water systems - Emergency drills
	Regulatory and Compliance	- Adherence to IAEA Safety Standards - NNR oversight - Reporting and transparency
	Performance Optimisation	- Load following – adjusting the reactor's output to match fluctuations in electricity demand, ensuring grid stability without compromising safety - Efficiency upgrades - Continuous operator training – implementing technological improvements and operational refinements to maximise energy output while minimising fuel use, waste, and overall operating costs.
	Radioactive Waste Management	- Spent fuel removal - Low- and intermediate-level waste packaging, transport and disposal - Waste tracking systems
Decommissioning The decommissioning phase includes the activities associated with the removal/dismantling of machinery/equipment/infrastructure no longer necessary to the operation.	Planning and Regulatory Approval	- Decommissioning plan development - Regulatory licensing - Funding assurance
	Radiological Characterisation	- Contamination mapping - Radiation monitoring systems

PHASE	COMPONENTS	KEY ACTIVITIES
	Facility Shutdown and Deactivation	■ Cessation of power generation ■ Shutdown all supporting plants (e.g. Hydrogen Plant) ■ Isolation and de-energisation of electrical systems ■ Draining and purging of process systems
	Decontamination	■ Cleaning plant systems and surfaces ■ Chemical and mechanical methods to remove radioactive residues to minimise waste volume and worker exposure
	Dismantling and Demolition	■ Removal of reactor vessel, steam generators, and piping ■ Controlled demolition of containment buildings ■ Heavy equipment handling for large radioactive components ■ Removal/demolish other plants (e.g. desalination/sewerage/hydrogen) ■ Removal of all office buildings/workshops and warehouses
	Radioactive Waste Management	■ Spent fuel removal ■ Low- and intermediate-level waste packaging, transport and disposal ■ Waste tracking systems
	Site Restoration	■ Environmental remediation ■ Property release ■ Licence termination

10.3 ACTIVITIES MATRIX

The impacts below have been assessed according to environmental categories. **Table 10-2** provides an indication of how these environments are linked to the various NEMA listed activities.

Table 10-2 – Activities Matrix (C – Construction, O – Operation, D – Decommissioning)

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
GNR 983 – Listing Notice 1																							
9(i)(ii) Infrastructure developments for bulk water or stormwater transport exceeding 1 000 metres in length, with either a diameter of 0.36 metres or more or a throughput of 120 litres per second or more, are included.	C	C O D	C O D	C O D	C O	-	C O D	-	C D	C D	C O D	-	-	-	C O D	C	-	-	-	-	-	-	-

²⁰¹ Refer to Chapter 7 for comprehensive listing notice descriptions.

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
11(i)(ii) The development of electricity transmission and distribution infrastructure applies to projects outside urban or industrial areas with capacities above 33 kV but below 275 kV, or inside such areas with capacities of 275 kV or more.	C	C	-	-	C	-	C	-	C	C	C	-	C O	-	C O D	C	O	C O	-	O	-	-	-
12(ii)(a)(b)(c) The development of dams, weirs, or other infrastructure with a footprint exceeding 100 square metres is included when located within a watercourse, in front of a development setback, or within 32 metres of a watercourse where no setback exists.	C	C O D	C O D	C O D	C O	-	C O D	-	C D	C D	C O D	-	-	-	C O D	C	-	-	-	-	-	-	-
13 The development of off-stream water storage facilities, such as dams or reservoirs, with a combined capacity of 50,000 cubic metres or more is included.	C	C	C O	C O D	C O	-	C	-	C O	C O	C O	O	-	-	-	C	-	C O D	-	-	-	-	-

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
14 The development of facilities or infrastructure for storing or handling dangerous goods is included when storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	C O D	C	C O D	C O D	C O D	O D	C O D	-	C O D	C O D	C O D	O D	O	-	C O D	C D	-	C O D	O D	O	O D	O D	C O D
16 The development and related operation of facilities for the desalination of water with a design capacity to produce more than 100 cubic metres of treated water per day.	O	C O D	C	C	C	C O D	C	-	C	C	C	C	-	-	C O D	C	-	C O D	O	O	-	-	-
17(i)(iii)(iv)(v)(e) This activity covers the development of jetties, slipways, tidal pools, embankments, stabilising structures, or buildings/ infrastructure of 50 square metres or more within the sea, estuaries, littoral zones, or within 100 metres of the high-water mark.	-	-	C O D	-	-	C O D	C	-	-	-	-	C O D	-	-	C O D	C	-	C O D	-	O	-	-	-

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
18 The planting of vegetation or placing of material on dunes or exposed sand surfaces larger than 10 square metres within the littoral active zone, aimed at restricting sand movement, erosion, or accretion, is included.	C	C O D	C D	-	C	-	C	-	C	C	C	-	-	-	C O D	C	-	C O D	-	C O D	-	-	-
19A(i)(ii)(iii) The infilling, depositing, dredging, excavation, removal, or moving of more than 5 cubic metres of material from the seashore, littoral active zone, estuaries, or the sea is included.	-	-	C O D	-	-	C O D	C	-	-	-	-	C O D	-	-	C O D	C	-	C O D	-	O	-	-	-
56(i)(ii) The widening of a road by more than 6 metres or lengthening by more than 1 kilometre is included when the existing reserve is wider than 13.5 metres, or where no reserve exists and the road is wider than 8 metres.	C	C	C	-	C	-	C	C	C	C	C	-	C	C O	C	C	C O	C O	-	-	-	-	C O

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
GNR 984 – Listing Notice 2																							
2 The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more.	C O	C O	C O D	-	C O D	C O D	C D C	-	C O D	C O D	C O D	-	C O D	C O D	C O D	C D	C O D	C O D	O	O	O	O D	C O D
3 The development and related operation of facilities or infrastructure for nuclear reaction including energy generation, the production, enrichment, processing, reprocessing, storage or disposal of nuclear fuels, radioactive products, nuclear waste or radioactive waste.	C O	C O	C O D	-	C O D	C O D	C D C	-	C O D	C O D	C O D	-	C O D	C O D	C O D	C D	C O D	C O D	O	O	O	O D	C O D
4 The development of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres	C O D	C	C O D	C O D	C O D	O D	C O D	-	C O D	C O D	C O D	O D	O	-	C O D	C D	-	C O D	O D	O	O D	O D	C O D

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
6 The development of facilities or infrastructure for processes requiring permits or licences under national or provincial emission, pollution, or effluent laws is included.	C O	C O	C O D	-	C O D	C O D	C D	-	C O D	C O D	C O D	-	C O D	C O D	C D	C O D	C O D	C O D	O	O	O	O D	C O D
15 The clearance of 20 hectares or more of indigenous vegetation is included.	-	C D	C D	-	C D	-	-	-	C O D	C O D	C O D	-	C O D	-	C O D	C D	-	C O D	-	C D	-	-	-
26(i)(iii)(iv)(v)(h) This activity covers the development of facilities or infrastructure such as piers, breakwaters, marinas, harbours, tunnels, or underwater channels within the sea, estuaries, littoral zones, or within 100 metres of the high-water mark.	-	-	C O D	-	-	C O D	C	-	-	-	-	C O D	-	-	C O D	C	-	C O D	-	O	-	-	-
27(i)(ii)(iii)(iv) The development of national, provincial, or major roads with reserves wider than 30 metres or carrying more than one lane of traffic in both directions is included.	C	C	C	-	C	-	C	C	C	C	C	-	C	C O	C	C	C O	C O	-	-	-	-	C O

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
GNR 985 – Listing Notice 3																							
2(a)(i)(ii)(aa)-(hh)/(iii)(aa)-(cc) In the Eastern Cape, the development of reservoirs for bulk water supply with a capacity over 250 cubic metres is included when located in estuarine zones, protected areas, sensitive biodiversity or conservation areas, near national parks or heritage sites, or within 1 km of the sea. 2(i)(i)(ii)(iii)(aa)(bb) In the Western Cape, such reservoir development is included when situated in protected areas, areas with indigenous vegetation, or urban zones designated as public open space or conservation areas.	C	C	C O	C O D	C O	-	C	-	C O	C O	C O	O	-	-	-	C	-	C O D	-	-	-	-	-

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
3(a)(i)(aa)-(ii)/(ii)(aa)(bb) In the Eastern Cape, the development of telecommunication masts or towers exceeding 15 metres on new sites is included when located in estuarine zones, protected or sensitive biodiversity areas, near national parks or heritage sites, within 1 km of the sea, or in urban areas designated as public open space or conservation zones. 3(i)(i)(ii)(iii) In the Western Cape, such mast or tower development is included in all areas outside urban zones, and within urban areas designated for conservation use or zoned as public open space.	-	C	-	-	-	-	C	-	C	C	-	-	C O D	-	-	C	-	C O D	-	-	-	-	-

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
4(a)(i)(aa)-(ii)/(ii)(aa)-(bb) In the Eastern Cape, the development of roads wider than 4 metres with reserves under 13.5 metres is included when located in estuarine zones, protected or sensitive biodiversity areas, near national parks or heritage sites, within 1 km of the sea, or in urban areas designated as public open space or conservation zones. 4(i)(i)(ii)(iii)(aa)(bb) In the Western Cape, such road development is included in areas outside urban zones containing indigenous vegetation or within estuarine functional zones, and in urban areas designated or zoned for conservation use.	C	C	C	-	C	-	C	C	C	C	-	C	C O	C	C	C O	C O	-	-	-	-	C O	

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
10(a)(i)(aa)-(II)/(ii)(aa)-(cc) In the Eastern Cape, the development and operation of facilities for storing or handling dangerous goods in containers with a combined capacity of 30–80 cubic metres is included when located in estuarine zones, watercourses, sensitive biodiversity or conservation areas, near national parks or heritage sites, within 1 km of the sea, or in urban areas designated as public open space or conservation zones. 10(i)(i)(ii)(iii)(aa)-(cc) In the Western Cape, such storage facility development is included in all areas outside urban zones, particularly those with indigenous vegetation or estuarine zones, and in urban areas designated or zoned for conservation use.	C O D	C	C O D	C O D	C O D	D O	C O D	-	C O D	C O D	C O D	D O	O	-	C O D	C O D	-	C O D	D O	O	C O D	D O	C O D

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
12(a)(i)-(v) In the Eastern Cape, the clearance of 300 square metres or more of indigenous vegetation is included when occurring in critically endangered ecosystems, critical biodiversity areas, littoral zones or within 100 metres of the sea or estuaries, or on land zoned for open space or conservation. 12(i)(i)-(v) In the Western Cape, such clearance is included under the same conditions—critically endangered ecosystems, biodiversity areas, littoral or estuarine zones, or land zoned for conservation or open space.	-	C D	C D	-	C D	-	-	-	C O D	C O D	C O D	-	C O D	-	C O D	C D	-	C O D	-	C D	-	-	-

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
14(a)(i)(aa)-(jj)/(ii)(aa)-(cc) In the Eastern Cape, the development of canals, channels, dams, weirs, marinas, jetties, slipways, buildings, boardwalks, or other infrastructure exceeding 10 square metres within watercourses, estuarine zones, or near the sea is included when located in protected, sensitive, or biodiversity areas, near national parks or heritage sites, or in urban zones designated for conservation or public open space. 14(i)(i)(aa)-(hh) In the Western Cape, such developments exceeding 10 square metres are included when situated outside urban areas in protected, sensitive, or biodiversity zones, World Heritage Sites, or estuarine functional zones, and within urban areas designated or zoned for conservation use.	C	C O D	C O D	C O D	C O	-	C O D	-	C D	C D	C O D	-	-	-	C O D	C	-	-	-	-	-	-	-

LISTED ACTIVITY ²⁰¹	AIR QUALITY	DUNE GEOMORPHOLOGY	GEOHYDROLOGY	FRESHWATER	SURFACE WATER	MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE	GEOTECHNICAL	AGRICULTURE	FAUNA AND INVERTEBRATES	FLORA	AQUATIC ECOSYSTEMS	MARINE ECOLOGY	AVIFAUNA	SOCIO-ECONOMIC	HERITAGE	NOISE	TOWN PLANNING	VISUAL	HEALTH	CLIMATE CHANGE	RADIOLOGICAL	RADIOACTIVE WASTE AND TRANSPORT	TRAFFIC
15(a)(i)(ii)(aa)-(cc) In the Eastern Cape, transforming land larger than 1 000 square metres from open space or conservation zoning (on or after 2 August 2010) to residential, retail, commercial, industrial, or institutional use is included when outside urban areas or within urban areas zoned for conservation, protected under NEMPAA, or identified as sensitive in an environmental management framework. 15(f)(i)(ii)(aa)-(cc) In the Western Cape, the same transformation of land over 1 000 square metres is included when outside urban areas or within urban areas zoned for conservation, protected under NEMPAA, or designated as sensitive in an environmental management framework.	-	C D	C D	-	C D	-	-	-	C O O D	C O C D	C O C D	-	C O C D	-	C O C D	C D	-	C O C D	-	C D	-	-	-

10.4 POTENTIAL IMPACTS

10.4.1 AIR QUALITY

The following preliminary impacts have been identified for the Air Quality aspect. The detailed report is included in **Appendix G.6**. Table 10-3 outlines the summary of the impacts identified and their significance.

Table 10-3 – Air Quality Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
PM ₁₀ Concentrations and Dustfall rate	Air emissions during construction include airborne particulates and gaseous emissions. However, airborne particulates are considered to potentially result in significantly higher impact than the gaseous pollutants. This could be both as inhalable air concentrations (PM ₁₀ and PM _{2.5}) and dust fallout levels. The airborne particulates include typical construction activities, such as scraping, excavation, loading, offloading and haulage; and wind erosion of exposed surfaces such as topsoil storage piles and open construction areas. Wheel entrainment is responsible for the majority of total particulate emissions and contributes about 89% at Thyspunt and 90% at Bantamsklip. Excavation is the next largest source, contributing about 7% each at Thyspunt and Bantamsklip. The most significant PM ₁₀ impact is predicted to occur along the unpaved access road. At Thyspunt, the NAAQS daily limit of 75 µg/m ³ is predicted to be exceeded up to 2.1 km from the road. At Bantamsklip, it is predicted to be exceeded by up to 3.0 km from the site. The fallout at both sites is quite significant.	C	High (B, T)	- Water sprays on all unpaved roads used during construction. - Chemical suppressants on all temporary on-site roads. - Paving of all permanent on-site roads. - Water sprays at all operational areas where dust is generated by dozing and grading. - Cover temporary stockpiles. - Water sprays at crushing and screening of aggregates.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
PM ₁₀ , SO ₂ , NO ₂ , CO, Ammonia and Formaldehyde Concentrations	Potential sources of air emissions (non-radioactive) during operation include: - PM, (SO₂, NO₂ and carbon monoxide (CO) in the exhaust gases from engines of the backup electricity generators. - Formaldehyde and CO emitted by the insulation when installations go back into operation after servicing. - Ammonia (NH₃) discharged as the temperature rises in the steam generators during start-up. The sources during operation include auxiliary steam boilers, emergency diesel generators, station blackout generators and gas turbines. Safety equipment, providing a backup power supply if the main supply is interrupted (so that the units can be secured and the reactors cooled) will produce combustion gases when operational. This would include mainly airborne PM, SO₂, NO₂, CO and carbon dioxide (CO₂). The pollutant emission rates per unit is as follows (single reactor unit): - Sulphur Dioxide: 1.74 g/s (used 0.05% S in fuel). - Carbon Monoxide: 2.5 g/s (25 ppmv or 30 mg/Nm³). - Oxides of Nitrogen: 6.7 g/s (42 ppmv or 80 mg/Nm³). - Particulates: 4.2 g/s (assume <50 mg/Nm³). Formaldehyde and CO emissions would result from the reactor units. Substances that may	O	Moderate (B, T)	- Best Practice Engineering Design on Boilers and stand-by Generators. - Leak Detection and Repair Programme (LDAR) programme on Diesel Storage Tanks (although not legally required per Listed Activity 2.4 for diesel, it is regarded as Good Practice). - Pave on-site roads.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	cause odour emissions include formaldehyde, ammonia, and diesel exhaust gases. The highest hourly average formaldehyde concentrations predicted at Thyspunt and Bantamsklip of 0.19 µg/m³ and 0.30 µg/m³, respectively. The highest hourly average ammonia concentrations predicted at Thyspunt and Bantamsklip are 21.8 µg/m³ and 35.0 µg/m³, respectively. It is lower than the US EPA's inhalation Reference Concentration (RfC) of 100 µg/m³. The predicted short-term ammonia and formaldehyde concentrations are also below the odour recognition concentrations of 200 µg/m³ (10% odour recognition level) and 70 µg/m³ (odour perception), respectively. The daily predicted air concentrations from backup electricity generators are as follows: - PM10: 14.4 µg/m³ at Thyspunt and 9.8 µg/m³ at Bantamsklip. - SO2: 6 µg/m³ at Thyspunt and 4 µg/m³ at Bantamsklip. - NO2: 23 µg/m³ at Thyspunt and 15.6 µg/m³ at Bantamsklip. - CO (hourly): 19.6 µg/m³ at Thyspunt and 31.4 µg/m³ at Bantamsklip.				
PM ₁₀ , SO ₂ , NO ₂ , and CO Concentrations, and Dustfall rates	The concern during decommissioning is mainly on dust generation from demolition activities. During decommissioning, contaminants can potentially occur during decommissioning operations, including demolition of conventional island and auxiliaries, safe	D	High (B, T)	- Water sprays on all exposed and cleared surface areas. - Chemical suppressants on all temporary on-site roads. - Cover temporary stockpiles.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	enclosure preparation, and electromechanical dismantling (non-radioactive and radionuclides – including combustion gases); spent fuel removal and electromechanical dismantling of the fuel building and auxiliaries (non-radioactive and radionuclides); and demolition of remaining structures and site rehabilitation (non-radioactive pollutants – mainly fugitive dust). Assuming an active area of about 50% of the NPP footprint, it is estimated that the NAAQS for PM10 of 75 µg/m³ can potentially be exceeded up to about 1 km.				

10.4.2 DUNE GEOMORPHOLOGY

The following preliminary impacts have been identified for the Dune Geomorphology aspect. The detailed report is included in **Appendix G.1**. Table 10-4 outlines the summary of the impacts identified and their significance.

Table 10-4 – Dune Geomorphology Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures (Based on Nuclear 1 Scope)	Significance – after mitigation
Development on mobile dunes	Development of roads and other infrastructure on mobile dunes.	C	High (T)	- Bantamsklip and Thyspunt - Any disturbance or damage to vegetation of the artificially vegetated mobile dunes can be rehabilitated by re-planting the dune sand with suitable	Moderate (T)
			N/A at B (no mobile dunes)		NA at B

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures (Based on Nuclear 1 Scope)	Significance – after mitigation
Development on artificially vegetated dunes	Development of NNP, roads and other infrastructure on artificially vegetated dunes.	C	Moderate (B, T)	pioneer species of indigenous vegetation to re-stabilise the dune sand and using brushwood and drift fences where necessary.	Low (B, T)
Development on naturally vegetated dunes	Development of NNP, roads and other infrastructure on naturally vegetated dunes.	C	Moderate (B, T)	Minimise area being cleared for construction at any one time, wet down these areas. Wet down soil stockpiles, cover stockpiles with brushwood.	Low (B, T)
Geomorphologic conservation value	Development of NNP, roads and other infrastructure on mobile dunes, naturally vegetated dunes and artificially vegetated dunes. Thyspunt The conservation value of the headland-bypass dunefields is high, as they are the only remaining large dunefields of this type that are still active in South Africa, even though not fully active as their feeder areas have been artificially stabilised (Tinley, 1985; Illenberger, 1998). The headland-bypass dunefields at Cape St. Francis are unique on a local, regional and probably global scale (Illenberger, 1998). The vegetated dunefield is a classic, almost pristine example of a suite of Holocene and Pleistocene dune ridges with a variety of origins: parabolic dunes, hairpin parabolic dunes, and sidewalls of previously mobile headland-bypass dunefields, including fairly unique examples of such sidewalls. The dune field has high interpretive value for elucidating coastal dune dynamics.	O	Low (B)	- Appoint a suitably qualified environmental officer to supervise the rehabilitation of vegetation on the Late Pleistocene parabolic dunes. This will reduce the environmental impact to low. - Monitor vegetated dunes and repair blowouts by placing brushwood or using drift fences on the bare sand surfaces and then re-vegetating the bare sand with suitable pioneer species.	Low (B)
			High (T)		Moderate (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures (Based on Nuclear 1 Scope)	Significance – after mitigation
Thyspunt – Based on Nuclear 1 Scope²⁰²					
Access roads across the fixed, vegetated dunes: Eastern and Western Access Roads	This entails crossing the vegetated dunes with a road that would need cut and fill to create a road with a smooth gradient.	C	Low (T)	Terraforce or similar blocks must be used to stabilise the sides of the cut and fill, as rehabilitation by vegetating the slopes will be difficult and slow. There will thus be little effect on the stability of the dunes, apart from the risk of slumping during the construction phase.	Low (T)
	Blowouts may form during construction when bare sand is exposed.	C	Moderate (T)	- Blowouts can be repaired by placing brushwood or using drift fences on the bare sand surfaces and then re-vegetating the bare sand with suitable pioneer species. - Terraforce or similar blocks must be used to stabilise the sides of the cut and fill as quickly as possible.	Low (T)
Construction of transmission lines across the mobile, unvegetated dunes	This entails building transmission lines directly across the mobile dunefield from the power station in the south to the HV yard in the north (in the “panhandle” section of the site). The dunefield is about 800 m wide in the area where the crossing is proposed. In this area,	C	Moderate (T)	It is suggested that conventional transmission towers with a maximum span of 400 m be used. With a suitable layout, only one set of towers will be needed within the mobile dunefield, as	Low (T)

²⁰² Applied in this section as it finds relevance.

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures (Based on Nuclear 1 Scope)	Significance – after mitigation
	transverse dunes in the mobile dunefield move eastward at rates of 15 to 20 m/yr, with interdune wetland areas. The dunes are about 10 - 20 m high in this area.			it is about 800 m wide in the area where the crossing is proposed. - Use helicopters to transport materials to build the towers within the mobile dunefield, so that access roads are not required. - Use an all-terrain vehicle or light 4-wheel drive vehicle to service the transmission lines (i.e. no permanent access roads are built). - Position the towers so that only one set must be built within the mobile dunefield. - Use a suitably qualified ECO to supervise positioning and emplacement of the towers. - The dunes are 10-20 m high in this part of the mobile dunefield. The relative tower height would thus be reduced by 10-20 m as a dune passes under a transmission line. It may be necessary to build higher towers in this area. A dune specialist must be consulted during the design phase.	
Construction of transmission lines across the fixed, vegetated dunes	This entails crossing the vegetated dunefield that consists of ridges running east – west. Construction roads and future access roads are assumed to be required, firstly a road running north – south, secondly roads running east – west along each row of towers. These roads would presumably be retained after construction for servicing the transmission lines.	C	Moderate (T)	- Locate the towers on a relatively broad, low ridge. Some flattening of the ridge may be needed. The substrate would be stable, as the sides of the ridges would slope at a sufficiently low angle. - Use Terraforce or similar blocks if necessary to stabilise the sides of the ridges. - A better mitigation is to locate the towers in a sufficiently wide inter-ridge	Low (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures (Based on Nuclear 1 Scope)	Significance – after mitigation
	Conventional transmission towers with a maximum span of 400 m ▪ If towers are located on a narrow steep-sided ridge, the ridge may be destabilised by the width required to build a tower foundation and an access road that must pass alongside the foundation to the position of the next tower foundation. ▪ If towers are located in an inter-ridge valley there may not be enough space for the tower footprint and access road, which would necessitate cutting into the adjacent ridges, which would destabilise the ridges.			valley so that no cutting into the adjacent ridges is required.	
Impacts due to climate change	Retreat of the coastline in response to higher sea level may shift or create new sandy beaches that supply wind-blown sand to dunes. Mobile dunes and dunefields may thus be created in areas that are currently vegetated. This would require monitoring and suitable management in the distant future. Wind speed is expected to increase by 10%, and storminess is expected to increase. Because wind-blown sand transport rate is roughly proportional to the cube of wind speed, sand transport rate and correspondingly dune movement rates of mobile dunes would increase by about 30%. Winds at Thyspunt will have a larger proportion of easterly winds, so the seasonal reversal of mobile dune movement will be higher, and net sand transport rate and correspondingly dune movement rates will decrease. As the	C, O	Low (T)	▪ Monitor vegetated dunes and repair blowouts by placing brushwood or using drift fences on the bare sand surfaces and then re-vegetating the bare sand with suitable pioneer species.	Very Low (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures (Based on Nuclear 1 Scope)	Significance – after mitigation
	proportion has not been quantified, the amount of decrease cannot be estimated. Temperature increase will have no effect on mobile dunes. Plants on vegetated dunes will be stressed by temperature increase, so blowouts will form more easily.				

10.4.3 GEOHYDROLOGY

The following preliminary impacts have been identified for the Geohydrology aspect. The detailed report is included in **Appendix G.4**. Table 10-5 outlines the summary of the impacts identified and their significance.

Table 10-5 – Geohydrology Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Depletion of aquifer(s) by nuclear footprint excavation dewatering	Dewatering of the foundation/footprint excavation. This can result in the following: - Lowering of the water table. - Seawater intrusion. - Drying up of coastal springs/seeps. - Increased drawdown/decreased yields in production boreholes. - Drying-up of wetlands.	C	Low (B, T)	Installation of a cut-off wall around the nuclear footprint excavation area.	Very Low (B, T)
Depletion of aquifer(s) by pumping for water supply	Pumping of groundwater for construction/operational use. This can result in the following:	C, O	Low (T)	Test pumping of production boreholes, assessment of recharge and numerical modelling of safe yield.	Very Low (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	- Lowering of the water table. - Seawater intrusion. - Drying up of coastal springs/seeps. - Increased drawdown/decreased yields in existing production boreholes. - Drying-up of wetlands.		NA at B		
Groundwater contamination	- Contamination of local groundwater by hydrocarbons – diesel/fuel spillages. - Contamination of local groundwater by organics (e.g. nitrates) and bacteria – On-site sanitation.	C, O, D	Low (B, T)	- Installation of a cut-off wall around the nuclear footprint excavation area. - Good housekeeping. - Emergency Response Procedure Plan. - Quarterly water quality monitoring.	Very Low (B, T)
Release of radioactivity	Potential release of radionuclides	O	Low (B, T)	Water quality monitoring (tritium) at site/regional level.	Very Low (B, T)

10.4.4 FRESHWATER SUPPLY

The following preliminary impacts have been identified for the Freshwater aspect. The detailed report is included in **Appendix G.5**. Table 10-6 outlines the summary of the impacts identified and their significance.

Table 10-6 – Freshwater Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Depletion of aquifers	Pumping from boreholes. This can result in the following: Lowering of the water table.	C	Low (T)	Analysis of test pumping data, recharge calculation and numerical modelling to determine sustainable abstraction.	Very Low (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	- Seawater intrusion. - Drying-up of coastal springs/seeps. - Increased drawdown/decreased yields in existing production boreholes. - Ingress of saline groundwater. - Drying-up of wetlands.		N/A at B		
Impact on surf zone	Construction and operation of a pipelines and services. This can result in destruction of vegetation along the servitude and disruption to fauna.	C	High (B, T)	Rehabilitation of the servitude/disturbed area.	Low (B, T)
		O	Low (B, T)		Very Low (B, T)
Effect of brine on surf zone	Disposal of brine.	C, O	High (B, T)	- Discharge of brine with cooling water outflow. - Disposal of brine 500 m offshore and compliance with water quality guidelines. - Blending of brine with NPP cooling water effluent discharge.	Very Low (B, T)
Wastewater disposal	Contamination of local groundwater.	O	Not assessed at Scoping stage.		

10.4.5 SURFACE WATER

The following preliminary impacts have been identified for the Surface Water aspect. The detailed report is included in **Appendix G.3**. Table 10-7 outlines the summary of the impacts identified and their significance.

Table 10-7 – Surface Water Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Increase in Runoff	Increase in runoff resulting in potential flooding due to increase in hard surface area.	C, O	Moderate (B, T)	Minimise hard surface areas during the planning phase and ensure stormwater management plan completed for the site and surrounding areas. Attenuate post development peak flows back to pre-development conditions prior to discharging back into the downstream environment.	Low (B, T)
Increase in Erosion	Increase in erosion resulting from increase in velocities due to increase in hard surface area.	C, O	Moderate (B, T)	- Minimise hard surface areas during the planning phase and ensure stormwater management plan completed for the site and surrounding areas. - Provide erosion protection / silt traps prior to discharging back into the downstream environment.	Low (B, T)
Changes in Flow Path	Changes in flow path resulting in concentrated flows and increase in velocities (previously sheet flow), due to infrastructure.	C, O	Moderate (B, T)	- During the planning phase ensure stormwater management plan completed for the site and surrounding areas. - Avoid concentrated flows and provide attenuation to ensure downstream property not negatively impacted from the change in flow direction.	Low (B, T)
Pollution of surface water	Pollution of surface water resulting from dirty water spills and silt deposition due to development of the nuclear plant and relating infrastructure.	C, O	Moderate (B, T)	Ensure clean and dirty water separation during the planning phase and incorporate into the stormwater management plan for the site and surrounding areas.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				Provide erosion protection / silt traps prior to discharging back into the downstream drainage lines and marine environment. Installation of a cut-off wall around the nuclear footprint excavation.	

10.4.6 MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE

The following preliminary impacts have been identified for the Marine Physical, Water Quality, Sediment Transport and Shoreline Change aspect. The detailed report is included in **Appendix G.13**. Table 10-8 outlines the summary of the impacts identified and their significance.

Table 10-8 – Marine Physical, Water Quality, Sediment Transport and Shoreline Change Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
On-beach placement: Sediments on the bottom and thickness	Changes to beach morphology, stability, and erosion patterns due to incompatible sediment characteristics or excessive fill thickness.	C, O	Moderate (B, T)	Ensure sediment compatibility and controlled placement thickness/profile through design templates, monitoring, and adaptive regrading to maintain natural beach processes.	Low (B, T)
On-beach placement: Turbidity and suspended sediments	Short-term increases in nearshore turbidity and suspended sediments during placement and wave reworking.	C, O	Moderate (B, T)	Minimise turbidity by using low-fines material, timing works to favourable conditions and applying adaptive turbidity triggers during placement.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
On-beach placement: Ecology (smothering and direct loss/disturbance of benthic habitat)	Temporary smothering and disturbance of intertidal and swash-zone organisms within the placement area.	C, O	Moderate (B, T)	Reduce ecological disturbance through micro-siting, staged or thin-layer placement, and pre- and post-placement ecological checks.	Low (B, T)
Nearshore disposal: Sediments on the bottom and thickness	Alteration of nearshore bathymetry and sediment transport pathways, potentially affecting erosion, accretion, and wave behaviour.	C, O	High (B, T)	Limit seabed and coastal process changes by selecting morphodynamically suitable sites, ensuring sediment compatibility, and controlling placement thickness with monitoring triggers.	Moderate (B, T)
Nearshore disposal: Turbidity and suspended sediments	Elevated turbidity from disposal plumes and resuspension of fine sediments during energetic conditions.	C, O	Moderate (B, T)	Manage turbidity through controlled release methods, timing placement for effective dispersion, and real-time monitoring with adaptive operational limits.	Low (B, T)
Nearshore disposal: Ecology (smothering and direct loss/disturbance of benthic habitat)	Smothering and disturbance of subtidal benthic habitats, with recovery dependent on burial depth and sediment dynamics.	C, O	High (B, T)	Protect benthic habitats by avoiding sensitive areas, using thin-layer placement, and adjusting operations based on deposition monitoring results.	Moderate (B, T)
Offshore disposal: Sediments on the bottom and thickness	Local modification of seabed morphology and currents, with potential remobilisation and interaction with nearshore coastal sediment systems.	C, O	High (B, T)	Maintain stable seabed conditions by selecting appropriate offshore sites, controlling mound geometry, and monitoring for migration or remobilisation.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Offshore disposal: Turbidity and suspended sediments	Generation and dispersion of sediment plumes, with fine material remaining suspended over wide areas depending on currents.	C, O	Moderate (B, T)	Reduce plume generation and spread through controlled disposal practices, condition-based timing, and defined turbidity thresholds.	Low (B, T)
Nearshore disposal: Ecology (smothering and direct loss/disturbance of benthic habitat)	Direct loss and burial of benthic habitat within and adjacent to the disposal footprint.	C, O	Moderate (B, T)	Minimise ecological impacts by targeting disturbed or mobile sandy habitats, limiting footprint and frequency, and applying benthic monitoring triggers.	Low (B, T)
Spoil disposal impacts on surf breaks	Spoil disposal can modify reef/bay bathymetry sufficiently to change wave breaking characteristics.	O	Very Low (B)	Not applicable	Very Low (B)
			Moderate (T)	Avoid shallow disposal near sensitive reef bathymetry; shift to deeper disposal/alternative sites and cap placement thickness with monitoring.	Low (T)
Dredging – Seabed excavation, morphology change and coastal processes	Changes to seabed levels and sediment pathways that may alter currents, wave transformation, and local erosion or infill patterns.	C, O	Moderate (B, T)	Minimise morphological impacts by optimising dredge layout and depth, designing for stability, and applying bathymetric and profile monitoring with adaptive responses.	Low (B, T)
Dredging – Water quality: plumes, turbidity, suspended sediments, and (where relevant) contaminants	Increased turbidity and sediment plumes, with potential mobilisation of contaminants where sediments are not clean.	C, O	High (B, T)	Water-quality impacts are fully reversible, provided sediments are clean and dredging ceases once operational controls are applied.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Dredging – Ecology: direct habitat loss/disturbance and indirect effects (smothering)	Removal and disturbance of benthic habitats and smothering of nearby areas from sediment resettlement.	C, O	Moderate (B, T)	Limit ecological impacts by avoiding sensitive habitats, staging dredging to reduce disturbance extent, and verifying deposition and recovery through monitoring.	Low (B, T)
Dredging – Construction and operational impacts	Noise, vibration, and limited navigation interference associated with dredging plant and support vessels.	C, O	Low (B, T)	Manage construction-related risks through a marine works management plan addressing noise, vessel operations, navigation safety, and infrastructure protection.	Very Low (B, T)
Short term disruption of sediment transport	Temporary in-water works can briefly alter wave breaking and longshore currents, causing short-lived local changes to littoral drift patterns.	C	Low (B, T)	Minimise footprint and duration of in-water works, schedule for calm windows, and rapidly reinstate the seabed/beach profile after works.	Low (B, T)
Local scour around temporary works	Temporary structures and excavations can generate local seabed scour and bed-level changes around the works footprint.	C	Low (B, T)	Avoid high-energy placement where possible and install temporary scour protection (mats/rock bags) with storm demobilisation triggers.	Low (B, T)
Dune/backshore disturbance	Backshore and dune disturbance can disrupt sand processes (e.g., aeolian transport to St Francis beaches) and reduce dune stability/resilience to events.	C	Moderate (B, T)	Restrict access routes, minimise vegetation clearing, and rehabilitate immediately with sand fencing and re-vegetation/stabilisation.	Low (B, T)
Beach erosion due to on-beach or surf zone outfall discharge	Outfall discharge directly on the beach causing channel erosion or in surf zone near the shoreline	C	Moderate (B, T)	Avoid by extending outfall to subtidal/offshore location, alternatively greater energy dissipation design as well as erosion protection measures.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Local sediment transport disruption from permanent structures – pipelines	Buried pipelines have negligible coastal effect, with only minor local scour/deposition possible near intake/outfall structures.	O	Low (B, T)	Bury pipelines below the active layer with adequate cover and monitor/re-bury if exposure thresholds are approached.	Very Low (B, T)
Local sediment transport disruption from permanent structures – intake stilling basin and outfall structure	An intake stilling basin and/or outfall structure can interrupt the longshore sediment supply, causing updrift accumulation and potential downdrift erosion (sediment starvation) if bypassing is not maintained.	O	Moderate (B)	Avoid a stilling basin in the active drift corridor where feasible; include a sediment bypass system sized to the longshore drift; maintenance plans.	Low (B)
			High (T)		Moderate (T)
Exposure of buried pipelines/structures due to future erosion	Shoreline retreat could expose buried elements, turning them into hard obstructions that locally alter sediment drift and promote scour.	O	Very Low (B, T)	Design for future exposure (deeper burial/armour) and implement trigger-based maintenance (reburial/armouring) as retreat progresses.	Very Low (B, T)
Pipeline outfall exposure/scour to adjacent areas risk under future erosion	As profiles retreat and wave loading increases (climate change) at the outfall, local scour and stability/maintenance risks increase even if broader morphology change remains limited.	O	Low (B, T)	Design outfall foundations and scour protection for future profile lowering and provide modular/accessible maintenance and inspection.	Very Low (B, T)
Shoreline and sedimentary budget changes due to spoil	Disposal of dredged material can create secondary sediment transport and shoreline effects depending on placement location and method.	O	Moderate (B, T)	Optimise disposal strategy to avoid down-drift impacts.	Low (B, T)
Long-term coastline recession (SLR and climate change)	Climate-driven sea-level rise and evolving storm/wave conditions drive progressive landward erosion/flood hazard that can encroach on the installation corridor over time.	O	Very High (B, T)	Site/raise infrastructure/equipment landward of conservative erosion/flood lines or provide engineered coastal protection designed for future SLR.	Very Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Wave-climate-driven shoreline rotation / planform change	Changes in wave climate can rotate embayments and shift alongshore sediment gradients, causing end-to-end erosion/accretion redistribution on sandy coasts.	O	Low (B, T)	Preserve coastal setback space for natural adjustment and use adaptive protection only if monitored thresholds are exceeded.	Very Low (B, T)
Event-driven storm erosion overlay (cross-shore beach erosion during storms)	Storms cause episodic cross-shore erosion and dune toe retreat, with run-up and flooding potentially extending beyond the erosion footprint.	O	Low (B, T)	Allow storm erosion/run-up freeboard in layout and protect critical assets with dune buffers or armouring designed for event conditions.	Very Low (B, T)
Localised rocky-coast retreat where erodible deposits occur	Where thin erodible materials overlie rock, extreme water levels and storm attack can trigger localised stripping and short-reach retreat which may, over time, encroach on infrastructure near the sea front.	O	Very Low (B, T)	Avoid vulnerable rocky pockets where possible and apply targeted toe protection/armouring plus monitoring where assets are nearby.	Very Low (B, T)
Chronic sedimentation at intakes	Related to sediment transport; ongoing sand ingress to intake basins (requires routine maintenance dredging or others to maintain operational capacity and storm buffer).	O	Low (B, T)	Design intake basins/sediment traps for predictable dredging access and capacity and plan a routine dredging and monitoring programme.	Low (B, T)
Storm-driven “pulse” sand ingress at intakes	Related to sediment transport; extreme storms can rapidly increase suspended sand transport and drive short-duration, high-volume infilling at intakes.	O	Low (B, T)	Design basins/screens and redundancy to tolerate storm pulses without blockage, supported by storm operating procedures and rapid clean-out capability.	Low (B, T)
Tsunami-driven erosion/deposition	Tsunami run-up/drawdown can generate strong currents and abrupt erosion/deposition that may rapidly reconfigure beaches and dunes (and subsequently impact the nuclear	C	Very Low (B, T)	Complete an updated THA and design coastal/critical systems for tsunami run-	Very Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	power plant from sediment related considerations).			up/drawdown currents with robust scour protection and emergency protocols.	
Elevated salinity in surf-zone and nearshore environments due to desalination brine discharges during construction stage	Elevated salinity due to desalination brine discharges on the beach or into the surf-zone during construction stages.	C	High (B, T)	Avoid by extending outfall to subtidal/offshore location, alternatively greater energy dissipation design as well as erosion protection measures.	Low (B, T)
Beach erosion due to on-beach or surf zone outfall discharge	Outfall discharge directly on the beach causing channel erosion or in surf zone near the shoreline	C	Moderate (B, T)	Avoid by extending outfall to subtidal/offshore location, alternatively greater energy dissipation design as well as erosion protection measures.	Low (B, T)
Plume dispersion of brine (stilling basin and raceway or offshore tunnel intake and outfall)	Impact to the marine environment due to higher salinity of discharged water compared to natural salinity levels.	C, O	Low (B, T)	Mixing of brine from the RO plant into cooling water is expected to sufficiently dilute brine to undetectable salinity levels. No further mitigation is expected to be required.	Low (B, T)
Thermal plume dispersion (stilling basin intake and raceway outfall)	Discharge of water with temperature elevated above ambient sea water temperatures, impacts to ecologically sensitive areas such as seabed benthic habitat and the shoreline. Discharge from a raceway has generally higher risk of impacts to sensitive benthic environment and shoreline, compared to discharge from offshore tunnel outfall, due to the location of a raceway on or very close to the shoreline.	O	High (B, T)	Technology and diffuser layout selection aimed at rapid dispersion plume movement away from sensitive benthic and nearshore areas. Also, frequent monitoring/measurement of discharge temperature.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Thermal plume dispersion (offshore tunnel intake and outfall)	Discharge of water with temperature elevated above ambient sea water temperatures, impacts to ecologically sensitive areas such as seabed benthic habitat and the shoreline. Discharge from an offshore tunnel outfall has generally lower impacts as buoyancy of plume and optimal diffuser location and layout encourage plume dispersion away from sensitive areas (benthic environment and shoreline).	O	High (B, T)	Bantamsklip - Further optimisation of outfall location and diffuser layout to encourage plume dispersion to mitigate current tendency of plume hugging the sensitive shoreline area. Frequent monitoring/measurement of discharge temperatures. Thyspunt - Further optimisation of outfall location and diffuser layout to encourage plume dispersion to mitigate current tendency of plume hugging the sensitive shoreline area and significant sea water temperature increases near the seafloor. Frequent monitoring/measurement of discharge temperatures.	Moderate (B, T)
Damage to intake or outfall structures due to abnormal/extreme metocean conditions	Damage to intake or outfall structures due to e.g., extreme waves, scour due to extreme currents or overtopping due to extreme wind and waves.	O	Low (B, T)	Design of structures to “no damage” criteria, and appropriate technology selection and siting of structures.	Very Low (B, T)
Blockage of intake pipes or outfall pipes	Marine life, marine growth or sediment causing blockage or suboptimal function of intake or outfall pipes.	O	Moderate (B, T)	Pipe design and measures such as use of velocity caps, grids and chlorine use. Considering a stilling basin intake, sedimentation mitigation includes a fixed dredging system.	Low (B, T)
Natural or climate-change-driven sea water	Risk of damage to, or failure of cooling system in the case of exceedance of design intake	O	Low (B)	Current cooling system with design maximum seawater temperature	Very Low (B)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
temperature increases (impact to cooling system)	water temperature. However, 1:100-year maximum predicted seawater temperature extremes remain within 30°C design threshold of the system, at both sites.			threshold sufficiently mitigates potential impacts and further mitigation is not expected to be necessary. 1:100-year maximum sea water temperature is 26.9°C, sufficiently lower than the 30.0°C limit.	
			Moderate (T)	1:100-year maximum sea water temperature is 29.0°C (including 1.0°C buffer), therefore current cooling system with design maximum seawater temperature threshold of 30.0°C sufficiently mitigates potential impacts, and further mitigation is not expected to be necessary.	Low (T)
Recirculation of thermal plume (stilling basin intake and raceway outfall)	Recirculation of discharged cooling water resulting in temperature increases of cooling water drawn in through the stilling basin for cooling of the NPP processes.	O	High (B, T)	Design and siting of raceway and stilling basin intake to achieve acceptable recirculation (<1.5°C temperature increase).	Low (B, T)
Recirculation of thermal plume (offshore tunnel intake and outfall)	Recirculation of discharged cooling water to offshore tunnel intakes resulting in temperature increases of cooling water drawn in through the stilling basin for cooling of the NPP processes.	O	Moderate (B)	Offshore tunnel intake technology, plume buoyancy and appropriate design and siting of intake and outfall sufficiently mitigates recirculation temperatures to <1.5°C temperature increase.	Very Low (B, T)
			Low (T)	Offshore tunnel intake technology, plume buoyancy and appropriate design and siting of intake and outfall sufficiently mitigates recirculation temperatures to <1.5°C temperature	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				increase. Steep bathymetry at Thyspunt allows more cost-effective implementation of an offshore tunnel intake and outfall.	
Flooding and inundation of the NPS due to distant tsunamis	Flooding and water level increases of 2.0 – 2.5 m relative to still water level, considering that the NPS is to be constructed at +10 m MSL at both Bantamsklip and Thyspunt.	O	Low (B, T)	Bantamsklip - Potential flooding is mitigated through appropriate setback lines, taking into account +2m tsunami-induced water level. Therefore, no additional mitigation is required. Thyspunt - Potential flooding is mitigated through appropriate setback lines, taking into account +2.5m tsunami-induced water level. Therefore, no additional mitigation is required.	Very Low (B, T)
Flooding and inundation of the NPS due to local tsunamis	Flooding and water level increases of 2.0 – 2.5 m relative to still water level, considering that the NPS is to be constructed at 10 m MSL at both Bantamsklip and Thyspunt.	O	Low (B, T)	Bantamsklip - Potential flooding is mitigated through appropriate setback lines, taking into account +2m tsunami-induced water level. Therefore, no additional mitigation is required. Thyspunt - Potential flooding is mitigated through appropriate setback lines, taking into account +2.5m tsunami-induced water level. Therefore, no additional mitigation is required.	Very Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Flooding and inundation of the NPS due to meteo-tsunamis	Coinciding extreme events (tsunami and extreme long wave generated water level increases due to metocean factors). Water level increases are modelled as 11.03 m MSL and 14.77 m MSL at Bantamsklip and Thyspunt, respectively.	O	Moderate (B)	Relocation of the NPS at higher elevation and/or implementation of appropriate coastal defence structures.	Very Low (B, T)
			High (T)	Relocation of the NPS at higher elevation and/or implementation of appropriate coastal defence structures. More extensive mitigation required at Thyspunt.	
Exposure of cooling water intake or outfall pipes	Maximum tsunami drawdown to -6.10m MSL (Thyspunt) to -7.64 m MSL (Bantamsklip), with water intake pipes located around -30 m MSL at both Thyspunt and -45 m MSL at Bantamsklip. The main risk in question is interruption of cooling water supply. No impact is expected at outfall pipes.	O	Low (B, T)	Appropriate depth of cooling water intakes and mitigates potential interruption of cooling water supply sufficiently. No further mitigation measures are required.	Low (B, T)
Exposure of cooling water basin (intake) or raceway (outfall)	Maximum tsunami drawdown to -6.10m MSL (Thyspunt) to -7.64 m MSL (Bantamsklip), relative to current proposed stilling basin elevation of -8.29m leaves little buffer should tsunami draw-down exceed modelled values. This would result in interruption of cooling water supply. Impacts on a raceway are expected to be insignificant, therefore only intake basin impacts re assessed here.	O	High (B, T)	Bantamsklip - Design intake basin at lower elevations (greater depth below MSL). A greater change to stilling basin level is required at Bantamsklip due to drawdown levels to lower elevations below MSL. Thyspunt - Design intake basin at lower elevations (greater depth below MSL).	Low (B, T)
Inundation and scour-induced sedimentation	The main impact to be considered here is the potential sedimentation within the settling basin, resulting in the need to remove sediment. Scour depths are predicted to be	O	Low (B, T)	Bantamsklip The offshore location and ~ -45m MSL depths of intake pipes mitigates	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
impact to intake and outfall pipes	limited to less than 2.5 m, within 200 m of the coastline.			potential impacts sufficiently. No further mitigation is needed. Thyspunt The offshore location and ~ -30m MSL depths of intake pipes mitigates potential impacts sufficiently. No further mitigation is needed.	
Disruption of intakes and outfalls due to sediment transport and deposits	Large volumes of sediment transported by tsunami currents risk blocking intake or outfall structures. Impacts or extent hereof, not expected to change significantly depending on the site chosen.	O	Moderate (B, T)	The current location of intake and outfall structures in areas of low sediment transport is expected to be sufficient mitigation.	Low (B, T)
Accidental spill	Accidental spills (e.g. hydrocarbons, chemicals, or untreated process water) are an important consideration for coastal nuclear facilities due to the presence of marine infrastructure such as stilling basins, intake and outfall structures, pipelines, and tunnels. Such events could occur during construction, operation, or maintenance activities and may result in short-term releases of contaminants to the marine environment. In addition to broader water-quality effects, accidental spills have the potential to compromise cooling-water intake quality, which is a critical operational requirement for nuclear facilities and could necessitate temporary intake shutdowns or operational restrictions. Physical impacts may include localised water-quality degradation, surface slick formation, and altered near-field mixing or circulation near intakes and outfalls.	C, O	Moderate (B, T)	Secondary containment, leak-detection and shut-off systems, intake water-quality monitoring, emergency response plans, and strict operational procedures.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	While the likelihood of major spills is generally low due to stringent nuclear-industry controls, their consequences in a coastal setting warrant consideration.				

10.4.7 GEOTECHNICAL

The following preliminary impacts have been identified for the Geotechnical aspect. The detailed report is included in **Appendix G.2**. Table 10-9 outlines the summary of the impacts identified and their significance.

Table 10-9 – Geotechnical Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Seismic Hazard	Vibration of the ground caused by tectonic movement along known or new faults at surface or rock stress release at depth result in earthquakes which may cause destruction to the proposed NPP.	C, O, D	Moderate (B, T)	- Design according to expected peak ground acceleration. - Ensure the proposed development meets the minimum requirements for infrastructure in a seismic zone. - Supplementary geoscientific investigations to further reduce uncertainties in seismic source characterisation and ground-motion modelling. - Continued quantification of uncertainties and ongoing updates to the Seismic Hazard Analysis to align with current international regulatory requirements.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Slope Stability	- Slope instability around structures caused by removal of soil and rock which affects safety hazard. - Steeply dipping joints in rock or boulders in soil mass may prove treacherous in cuttings and deep foundation excavation leading to collapse of sidewalls.	C	Low (B, T)	Design cut slopes according to detailed geotechnical analysis and adopt appropriate support mechanisms.	Very Low (B, T)
Soil erosion from clearing of sites for drilling and test pitting	- Increase stormwater velocity. - Increase in soil and wind erosion due to cleared vegetation. - Creation of drainage paths along access tracks and side slopes. - Sedimentation of non-perennial features and excessive dust.	C	Very High (B, T)	- Rehabilitation of affected areas (such as revegetation). - Construction of temporary berms and drainage channels to divert surface water. - Minimise earthworks and fills. - Use existing road network and access tracks. - Correct engineering design and construction of gravel roads and water crossings. - Control stormwater flow. - Dust suppression measures for wind erosion.	Low (B, T)
Potential Hydrocarbon (oils, fuels and chemicals) spillages during drilling (geotechnical investigations)	Potential groundwater and drainage feature contamination from geotechnical heavy machinery.	C, D	Very High (B, T)	- Construction machinery repairs to be undertaken in designated areas with proper soil protection (i.e. on impermeable surfaces or with the use of drip trays). - Spill kit to be maintained on site, spills and contaminated soils to be collected and disposed appropriately. - Frequent checks and conditional monitoring.	Very Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Volcanic Activity	Eruption of molten rock (magma), gases, and ash from beneath Earth's surface, occurring primarily at tectonic plate boundaries. Main hazards include lava flows, pyroclastic flows (fast-moving hot gas and rock), ashfall, and secondary explosions, often accompanied by earthquakes and ground deformation.	C, O, D	Moderate (B, T)	No mitigation – There is no risk of volcanic activity that would hinder the development of a NPP.	Low (B, T)
Surface Rupture	The visible and permanent displacement of the ground surface resulting from slip along a fault that propagates to the surface during an earthquake. It typically manifests as cracks, ridges, or fissures and can cause severe, direct damage to structures and linear infrastructure, such as buildings, roads, and pipelines, that cross the fault trace.	C, O, D	High (B, T)	- A thorough assessment of the excavated footprint area for ant presence of undetectable capable faults. - The findings of the geological and seismological investigations shall be used as design input for the determination of the ground motions applicable during construction, operation, as well as for the regulatory period following decommissioning.	Moderate (B, T)

10.4.8 AGRICULTURE

The following preliminary impacts have been identified for the Agricultural aspect. The detailed report is included in **Appendix G.17**.



Table 10-10 outlines the summary of the impacts identified and their significance.

Table 10-10 – Agricultural Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Loss of future agricultural production potential	The entire Bantamsklip site and the Thyspunt coastal site are considered to be below the threshold for needing to be conserved as agricultural production land because of the limitations that make them totally unsuitable as viable cropland. The proposed development on this land will therefore result in negligible loss of future agricultural production potential. The overall negative agricultural impact of the development on these sites (loss of future agricultural production potential) is therefore assessed as being of low significance and as acceptable.	C	Low (B, T)	- The most important and effective mitigation of agricultural impacts for any development is avoidance of viable, potential cropland. This development has already applied this mitigation by selecting a site on which there is no viable, potential cropland, except for the inland Thyspunt site. There is no mitigation for occupation of agricultural land, such as may occur on the Thyspunt inland site. - The threat of erosion can be effectively managed so as not to cause any negative impact. This development is a large, sophisticated and expensive engineering undertaking. Inherent in such a project is a sophisticated system for managing water runoff. Threat of erosion in such projects is simply managed by the sophisticated engineering and resources that are available to such projects.	Very Low (B, T)
	In the case of the inland Thyspunt site, the entire site is considered to be above the threshold for needing to be conserved as agricultural production land because of its suitability for irrigated pastureland. The proposed development will result in the permanent loss of this land to agriculture, which will result in a loss of future agricultural production potential in terms of national food security.	C	Moderate (T)		Moderate (T)

10.4.9 FAUNA AND INVERTEBRATES

The following preliminary impacts have been identified for the Fauna and Invertebrates aspect. The detailed report is included in **Appendix G.8**. Table 10-11 outlines the summary of the impacts identified and their significance.

Table 10-11 – Fauna and Invertebrates Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Vertebrates					
Loss of habitat	Primary activities include: - Direct loss as a result of construction and operation of the proposed development. - Secondary impacts associated with noise, dust and influx of AIPs into these areas. - Access roads and servitudes. - Prevention of fires or incorrect fire regimes. - Improper solid waste disposal. - Dust precipitation. Secondary impacts anticipated include: - Habitat fragmentation. - Loss of ecosystem services. - Emigration of fauna species, potentially including SCC. - Increased potential for soil erosion. - Habitat fragmentation. - Increased potential for establishment of alien invasive vegetation.	C	Very High (B, T)	- Restrict development to recommended areas. The recommended areas are those with low or medium faunal sensitivity. - All 'High' Site Ecological Importance (SEI) habitats are to be avoided. - Areas to be developed/disturbed be specifically demarcated so that during the construction/activity phase, only the demarcated areas be impacted upon. - Restrict the footprint of the development to the smallest area possible. While the actual footprints of the buildings may be fixed, other areas are likely to be more flexible in their extent, e.g., areas for lay down, storage of topsoil, parking, etc. Consolidate all affected areas into one impacted node and avoid impact sprawl. - All vehicles and personnel must make use of existing roads and walking paths where possible, especially construction/operational vehicles. - Access road for the project needs to follow existing road into the Project Area of Influence (PAOI).	High (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Encroachment of AIP species in disturbed areas	Primary activities include: - Vegetation removal. - Soil disturbance. - Vehicles potentially spreading seed. - Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents. - Creation of infrastructure suitable for breeding activities of alien and/or invasive birds. Secondary impacts anticipated include: - Habitat loss for native flora and fauna (including potential SCC). - Alteration of fauna assemblages due to habitat modification. - Reduced forage quality of grazing habitat. - Spreading of potentially dangerous diseases. - Explosion of rodent populations and associated disease risk.	C	High (B, T)	- Control Alien and Invasive Fauna. - Implement rodent and pest control around camps and infrastructure, using targeted trapping and safe poison protocols to avoid harm to native species and predators. - Enforce a zero-tolerance policy for the trade or transport of fauna by staff and contractors. - Any materials may not be stored for extended periods of time and must be removed from the PAOI once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas - Implementation of a waste management plan. - Temporary storage of domestic waste shall be in covered waste skips. - Removal of domestic waste on a regular basis, no overspill is permitted.	Low (B, T)
Direct mortality of fauna species, including possible SCCs	Primary activities include: - Clearing of vegetation. - Roadkill due to vehicle collision. - Preparation of soil with heavy machinery	C	Very High (B, T)	- Clear the site in a logical sequence. Initial site clearance should be carried out in manner that allows mobile species to escape. - Prior to vegetation clearing activities, the area to be cleared should be walked on foot by 1-2 individuals to	High (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	- Soil excavations and soil transportation. - Intentional killing of fauna for food (hunting) or persecution (especially with regards to herpetofauna). - Pollution of water resources due to spilling of hazardous chemicals from heavy machinery during construction. Secondary impacts anticipated include: - Loss of habitat. - Loss of ecosystem services.			create a disturbance in order for fauna to move off. Disturbance must occur as soon before vegetation clearing as possible and no unnecessary disturbance to the area is permitted. - Any fauna threatened by the construction activities should be removed safely by an appropriately qualified environmental officer or removal specialist with the necessary ethics approvals and permits. - All construction vehicles should adhere to a speed limit of maximum 30 km/h to avoid collisions. All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings, dust and erosion is limited. Appropriate speed control measures and signs must be erected. - The timing between clearing of an area and subsequent development must be minimised to avoid fauna from re-entering the site to be disturbed. - Any holes/deep excavations must be done in a progressive manner on a needs basis only. No holes/excavations may be left open overnight. In the event holes/excavations are required to remain open overnight, these areas must be covered to prevent fauna falling into these areas and	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				subsequently inspected prior to backfilling. ■ All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Training and must include awareness about not harming or collecting species. ■ All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species, and owls, which are often persecuted out of superstition. Signs must be put up to enforce this. ■ Anti-poaching efforts should be envisaged, and the following should be the anchors: Risk-based, lifecycle approach: build measures into ESIA, Biodiversity Action Plan, and Closure Plan from the start; update based on monitoring. Route and site selection: avoid critical habitats and wildlife corridors. Lighting and fencing: use security fencing designed to limit unauthorised human entry while incorporating wildlife-friendly crossings where feasible. Do no harm: align with the mitigation hierarchy (avoid–minimise): Zero-tolerance policy: explicit ban on hunting, possession, transport, or purchase	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				of wildlife/bushmeat by employees and contractors; clear, proportional sanctions. Gatehouse protocols: inspect vehicles, bags, and cargo with rights-respecting procedures; record and report seizures; integrate license plate recognition where proportionate. Contractor clauses: embed anti-poaching commitments in contracts; require training and data-sharing; audit compliance. Busing over private vehicles: reduce private vehicle access; shift bus schedules to minimise off-hours road usage. Partner up: co-design with government wildlife authorities, local/Indigenous communities, and credible NGOs (Endangered Wildlife Trust (EWT)).	
Emigration of fauna	Primary activities include: - Disturbance from construction activities. - Loss of habitat and degradation of surrounding habitats. Secondary impacts anticipated include: - Reduced population of protected species, and potentially SCC. - Loss of ecosystem services.	C	High (B, T)	Maintain and Enhance Habitat Connectivity: Provide permeable fencing adjacent to known sensitive habitats to facilitate movement of faunal species. Construct fauna underpasses (e.g., large culverts or pipes) where roads cross sensitive habitats, especially for migratory and Red-Listed species. Remove or realign fences in sensitive areas or increase buffer zones to allow animal movement and escape from roads.	Moderate (B, T)
Reduced dispersal/migration of fauna	Primary activities include: - Removal of vegetation. - Loss of landscape used as corridor.	C	High (B, T)	- Restrict development to recommended areas. - Rehabilitate affected areas, where possible.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	- Compacted roads. Secondary impacts anticipated include: - Loss of ecosystem services. - Reduced plant seed dispersal.			- Restrict the footprint of the development to the smallest area possible; consolidate into one node and avoid sprawl. - Do not clear areas of indigenous vegetation outside of the authorised development footprint within the PAOI. Minimise vegetation clearing to the minimum required. Practical phased development and vegetation clearing should be practiced so that cleared areas are not left un-vegetated and vulnerable to erosion for extended periods of time. - Where possible, work should be restricted to one area at a time and be systematic. This is to reduce the number and extent of on-site activities, allowing fauna to move off as the Project progresses. This will give the mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories. - No construction activity is to occur at night.	
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, light and dust	Primary activities include: - Operation of machinery (generators, vehicles). - Vehicles operating at night. - Large, intense fluorescent and mercury vapor lighting. Secondary impacts anticipated include:	C	Very High (B, T)	Schedule activities and operations during least sensitive period: Construction and driving on roads at night should be restricted in order to reduce or prevent wildlife road mortalities which occur more frequently during this period. Construction should take place during the dry season (May-July) as much is feasible,	High (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	Loss of ecosystem services.			especially considering the fauna and their movement. - Outside lighting should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from any sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor lamps characteristically produce orange (LPSV) or orange/yellow (HPSV) light, with LPSV being far the preferred option (along with monochrome orange LED) for minimising impacts on insects and turtles. - Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas. No non-environmentally friendly suppressants may be used as this could result in pollution of water sources. - Minimise vegetation clearing to the minimum required. Areas should be cleared and disturbed on a needs basis only, as opposed to clearing and disturbing a number of sites simultaneously.	
Invertebrates					

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Loss of habitat	Primary activities include: - Direct habitat loss as a result of construction of the proposed development. - Secondary impacts associated with influx and spread of AIPs into disturbed and natural areas. - Clearing of access roads and servitudes. - Prevention of fires or implementation of incorrect fire regimes. - Improper solid waste disposal. Secondary impacts anticipated include: - Habitat fragmentation. - Loss of ecosystem services. - Emigration of invertebrate fauna species, potentially including SCC. - Increased potential for soil erosion. - Increased potential for establishment of alien invasive vegetation.	C	Very High (B, T)	- The only truly effective mitigation of the impact of habitat destruction on invertebrates is avoidance, using careful planning of site layouts to minimise the effects on sensitive habitats; rehabilitation may to some extent reduce the long-term impacts, but since many invertebrate communities are strongly influenced by fine-scale and often subtle difference in soil and other microhabitat structure, it is virtually impossible to recreate predevelopment conditions, and restoration of the original habitat is impractical. - Where residual impacts remain even after avoidance and other mitigation measures have been applied, biodiversity offsets may be appropriate.	High (B, T) ²⁰³
	Primary activities include:	C	Very High (B, T)		High (B)

²⁰³ The impact methodology used to determine the impact significance presents a 'Very High' residual impact. However, it is the specialist opinion that the overall residual impact significance is more accurately represented as 'High'.

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Direct mortality of invertebrates, including SCCs confirmed to be present	- Clearing of vegetation. - Roadkill due to vehicle collision. - Preparation of soil with heavy machinery - Soil excavations and soil transportation. - Intentional killing of invertebrates perceived as a nuisance. - Pollution of water resources due to spilling of hazardous chemicals from heavy machinery during construction. Secondary impacts anticipated include: - Loss of habitat. - Loss of ecosystem services.			- Clear the site in a logical sequence. Initial site clearance should be carried out in manner that allows mobile species to escape. - Prior to vegetation clearing activities, the area to be cleared should be walked on foot by 1-2 individuals to create a disturbance in order for invertebrates to move off. Disturbance must occur as soon before vegetation clearing as possible and no unnecessary disturbance to the area is permitted. - Any invertebrates threatened by the construction activities should be removed safely by an appropriately qualified environmental officer or removal specialist with the necessary ethics approvals and permits. - All construction vehicles should adhere to a speed limit of maximum 30 km/h to avoid collisions. All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings, dust and erosion is limited. Appropriate speed control measures and signs must be erected. - The timing between clearing of an area and subsequent development must be minimised to avoid invertebrates from re-entering the site to be disturbed.	Moderate (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				- Any holes/deep excavations must be done in a progressive manner on a needs basis only. No holes/excavations may be left open overnight. In the event holes/excavations are required to remain open overnight, these areas must be covered to prevent fauna falling into these areas and subsequently inspected prior to backfilling. - All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Training and must include awareness about not harming or collecting species. - All personnel should undergo environmental induction with regards to invertebrates and in particular awareness about not harming, collecting, or hunting these species. Signs must be put up to enforce this. - Anti-poaching efforts should be envisaged, and the following should be the anchors: Risk-based, lifecycle approach: build measures into ESIA, Biodiversity Action Plan, and Closure Plan from the start; update based on monitoring. Route and site selection: avoid critical habitats and invertebrate corridors. Lighting and fencing: use security fencing designed to limit unauthorised human entry	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				while incorporating wildlife-friendly crossings where feasible. Do no harm: align with the mitigation hierarchy (avoid–minimise): Zero-tolerance policy: explicit ban on hunting, possession, transport, or purchase of wildlife/bushmeat by employees and contractors; clear, proportional sanctions. Gatehouse protocols: inspect vehicles, bags, and cargo with rights-respecting procedures; record and report seizures; integrate license plate recognition where proportionate. Contractor clauses: embed anti-poaching commitments in contracts; require training and data-sharing; audit compliance. Busing over private vehicles: reduce private vehicle access; shift bus schedules to minimise off-hours road usage. Partner up: co-design with government wildlife authorities, local/Indigenous communities, and credible NGOs (EWT).	
Introduction of alien invasive invertebrate species	Alien species may be transported onto construction sites in construction material, especially where these have passed through and/or been stockpiled near ports. There is a very high risk of introduction of alien invasive species, especially the Argentine Ant (<i>Linepithema humile</i>), at both proposed sites. Primary activities include:	C	Very High (B) High (T)	Institute strict control over materials, equipment and vehicles brought onto site, which should be inspected for potential invasive species and / or steps taken to eradicate these before transport to the site. Two possible approaches are: visual inspection of all materials, particularly those that have been stockpiled	High (B) Moderate (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	- Import of construction equipment, vehicles and materials that have been infested with alien invertebrate species. Secondary impacts anticipated include: - Displacement of native fauna by competition from alien species, resulting in changes in community structure. - Predation of native invertebrate fauna, including confirmed SCC, by alien species. - Impacts on pollination and seed dispersal services resulting in impacts on vegetation communities.			in high-risk locations, for presence of invasive species and apply topical control (e.g. direct spraying with low residual insecticides) when necessary; and Routine fumigation or spraying of all materials with appropriate low-residue insecticides prior to transport to or in a quarantine area on site. The second option requires less highly trained personnel but would probably result in much higher usage of pesticides. - Rehabilitate disturbed areas as quickly as possible to reduce the area where invasive species would be at a strong advantage and most easily able to establish. - Institute a monitoring programme to detect alien invasive species. - Institute an eradication / control programme for early intervention if invasive species are detected, so that their spread to surrounding natural ecosystems can be prevented. - Monitoring programmes and control measures should be developed with reference inter alia to information provided by the IUCN SSC Invasive Species Specialist Group²⁰⁴.	

²⁰⁴ <http://www.issg.org/>

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				Institute strict controls over materials and equipment being transported away from the site, to minimise the risk that species from the project area could be transported out of their natural range and potentially become tramp or invasive species elsewhere.	
Light pollution	The impacts of artificial lighting on insect populations can be very significant, resulting in the deaths of many thousands of individuals every night, and causing a very substantial drain effect (“population sink”) on surrounding populations. Other impacts may include interference with normal navigation, foraging and mating behaviours, resulting in less immediate but equally significant reductions in natural population levels. The consequent knock-on effects, given the vital role that invertebrates play in ecosystem functioning, may affect virtually every component of the surrounding ecosystem (Rich & Longcore 2006). Impacts may affect community composition of other animal groups; for example, bats that are able to learn to exploit artificial light sources for foraging may displace other bat species which do not forage around lights (Rydell 2006). Secondary impacts may result from insecticides being used to kill large numbers of insects attracted to lights and being perceived as a nuisance to project personnel.	C	Very High (B, T)	- Use LPSV or monochrome orange LED lamps in ALL situations (including indoor locations where windows allow light to be emitted to the exterior) where lights could be visible from natural habitats. Use of monochrome light sources not only virtually eliminates direct impacts of light pollution on invertebrates, but also prevents insects attracted to lights being a nuisance and hence avoids secondary impact of insects being deliberately killed to prevent irritation to personnel. NO white LED, mercury vapour, halogen, HPSV or any other lamp producing wavelengths shorter than 560 nm should be used where their emissions will be visible in natural habitats. - Use the minimum power lamps necessary to produce essential illumination levels. - Use motion-sensor triggers for security lighting to minimise the duration for which light is emitted. - Direct all exterior lighting appropriately to illuminate only the desired area and/or shielded so as to eliminate spill	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	Light pollution affects invertebrate communities at differing distance from the light source in different ways, which may make impacts difficult to quantify. Within the zone of influence of a light source (the extent of which will vary due to a number of factors including spectral composition, intensity, height and orientation of the source, as well as the sensitivity of the organisms constituting the local invertebrate community), invertebrates will be attracted toward the source where many will die. This results in reduced numbers within most of the zone of influence and is termed the “vacuum cleaner effect”. Close to the source flying insects become concentrated and attract predators and scavengers, which may strongly alter the local community composition in the vicinity of the source (Davies et al. 2012). Further away, but within the zone of influence, the density of flying insects will be reduced, and this is expected to affect both plant and animal communities in multiple ways (e.g. both pollination and herbivory may be reduced, which will affect different plant species differently; availability of prey for invertebrate and vertebrate predators will be reduced). Beyond the zone of influence an area of partial reduction in flying insect abundance is expected due to the imbalance in emigration and immigration on either side of the boundary of the zone of influence. For species with a short			into areas where lighting is not required.	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	active adult lifespan, the effect may be seasonal, but for others such as ants, permanent year-round effects on community structure are expected due to a reduction in recruitment of species with nuptial flights at night, while species which fly during the day are unaffected. Direct impacts of artificial lights such as high-pressure mercury vapour streetlamps may extend up to 600 m or more from the source (Eisenbeis 2006), and the drain effect resulting from continual depletion of the populations within this zone will probably cause a significant decline in population density of affected species up to at least several times this distance. New high-power white LED floodlights (up to 1000W) now exceed even the most powerful HPMV lamps in output by a factor of about 10 and may have impacts many km from the source. High level unshielded lighting could thus substantially extend the area of direct impact, with lower intensity indirect impacts potentially being significant over a very large area. If left unmanaged these impacts will continue throughout the life of the project and no justification can be made for allowing such easily controllable impacts to occur. Primary activities include: ■ Mortality of invertebrates attracted to lights.				

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	- Interference with navigation, foraging and mating behaviour. Secondary impacts anticipated include: - Changes in invertebrate community structure due to differential impacts of lighting on different species. - Changes in vertebrate fauna communities due to differential utilisation of prey attracted to lights.				
Noise pollution, vibration	Disturbance due to noise from the construction operations (mainly vehicles) would be expected to interfere with communication of invertebrates such as cicadas and many grasshoppers, katydids and other species utilising sound in mate recognition. This disturbance from machinery could extend at least several hundred metres from the construction site; blasting noise, while exerting an influence at much larger distances (possibly 1.5-2.0 km or more), is of such a brief duration that its impact is expected to be very small. Vibrations transmitted through the soil may also disturb burrowing organisms and may eventually result in species moving away from the vicinity of the construction site. Primary activities include: - Construction-induced disturbance to invertebrate fauna resulting in emigration. - Interference with mating behaviour.	C	High (B) Moderate (T)	- Use low noise output models of all machinery where possible, especially during the construction phase; this would have the desirable effect of also minimising noise impacts on personnel and surrounding communities. - Construct berms to shield surrounding habitat from construction sites.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	Secondary impacts anticipated include: Changes in invertebrate community structure due to differential impacts on different species.				
Dust pollution	Excavation and movement of soil, as well as movement of heavy vehicles on dirt roads, has the potential to cause substantial dust pollution in the area surrounding the construction site and access roads. Accumulation of dust on plants can reduce their productivity, with knock-on effects on invertebrate herbivores and their predators as well as directly interfering with invertebrate species by e.g. physically impeding their movement on plants, causing abrasion of their desiccation-limiting waxy cuticular layers, and blocking their spiracles with resulting effects on breathing. Primary activities include: - Reduction in plant productivity resulting in reduced food supply for invertebrates. - Impedance of movement of invertebrates on plants. - Mortality of invertebrates due to abrasion of the desiccation-limiting waxy cuticular layers, and blockage of spiracles with resulting effects on breathing. Secondary impacts anticipated include:	C	High (B, T)	Institute strict dust control measures on unpaved roads and areas cleared of vegetation; tar or pave permanent roads.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	Reduction in food supply for insectivorous vertebrate species.				
Habitat fragmentation and movement restriction	Habitat fragmentation and movement restriction reduce the ability of species to access food, mates, and suitable habitats, leading to population declines and loss of biodiversity.	O	High (B, T)	- Avoid the further disturbance or destruction of High SEI areas - A Rehabilitation Plan must be implemented. - Access roads should have run-off control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.	Moderate (B, T)
Direct mortality of vertebrate species, mainly from road mortality (operational traffic)	Direct mortality of vertebrate species from road traffic occurs when animals are struck by vehicles, leading to population declines and disruption of local ecosystems.	O	Very High (B, T)	- All personnel and contractors must undergo Environmental Awareness Training and must include awareness about not harming or collecting species. - Any fauna threatened by the maintenance and operational activities should be removed to a safe location by an appropriate individual. - All vehicles accessing the site should adhere to a max 30 km/h max to avoid collisions. Appropriate signs must be erected. Collisions, especially considering tortoises, should be monitored on a weekly basis.	Moderate (B, T)
Encroachment of alien and invasive species in disturbed areas	Encroachment of alien and invasive species in disturbed areas leads to the displacement of native flora and fauna, altering ecosystem balance and reducing biodiversity.	O	High (B, T)	Create and implement a Solid Waste Management Plan. Prioritise waste management by ensuring all waste is collected, stored, and disposed of properly. It is recommended to remove waste from the site at least weekly	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				Implement a pest control plan, ensuring that no poisons are used.	
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, light and dust	Disruption or alteration of ecological life cycles due to noise, light, and dust interferes with species' breeding, migration, and feeding behaviours, ultimately weakening population stability and ecosystem resilience.	O	High (B, T)	- Any outside lighting should be designed and limited to minimise impacts on fauna. Lighting fixtures should be fitted with baffles, hoods or louvres and directed downward. Outside lighting should be directed away from highly sensitive areas such as the wetlands. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (yellow) lights should be used wherever possible. - Where feasible, motion detection lighting must be used to minimise the unnecessary illumination of areas. - No vehicle traffic nor the use of vehicle lights should be permitted during the night. - Noise must be kept to a minimum from dusk to dawn to minimise all possible disturbances to amphibian species and nocturnal mammals.	Moderate (B, T)
Direct mortality of invertebrate species	Direct mortality of invertebrate species occurs when individuals are killed through human activities such as construction, traffic, or chemical exposure, leading to declines in local populations and disruption of ecosystem functions.	O	Very High (B, T)	- All personnel and contractors must undergo Environmental Awareness Training and this must include awareness about not harming or collecting species. - All vehicles accessing the site should adhere to a max 30 km/h max to avoid collisions. Appropriate signs must be erected and speed limits enforced.	High (B) Moderate (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				Installation of a Speed Awareness System is highly recommended.	
Introduction of alien invasive invertebrate species	Introduction of alien invasive invertebrate species disrupts native ecosystems by outcompeting local species, spreading rapidly, and altering ecological processes, which can lead to biodiversity loss and habitat degradation.	O	Very High (B, T)	- Institute strict control over materials, equipment and vehicles brought onto site, which should be inspected for potential invasive species and / or steps taken to eradicate these before transport to the site. Two possible approaches are: Visual inspection of all materials, particularly those that have been stockpiled in high-risk locations, for presence of invasive species and apply topical control (e.g. direct spraying with low residual insecticides) when necessary; and Routine fumigation or spraying of all materials with appropriate low-residue insecticides prior to transport to or in a quarantine area on site. The second option requires less highly trained personnel but would probably result in much higher usage of pesticides. - Rehabilitate disturbed areas as quickly as possible to reduce the area where invasive species would be at a strong advantage and most easily able to establish. - Institute a monitoring programme to detect alien invasive species. - Institute an eradication / control programme for early intervention if invasive species are detected, so that	High (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				their spread to surrounding natural ecosystems can be prevented. - Monitoring programmes and control measures should be developed with reference inter alia to information provided by the IUCN SSC Invasive Species Specialist Group²⁰⁴. - Institute strict controls over materials and equipment being transported away from the site, to minimise the risk that species from the project area could be transported out of their natural range and potentially become tramp or invasive species elsewhere.	
Light pollution impacts on invertebrates	Light pollution impacts on invertebrates by disrupting their natural behaviours such as navigation, feeding, and reproduction, often leading to population declines and altered ecosystem dynamics.	O	Very High (B, T)	Use LPSV or monochrome orange LED lamps in ALL situations (including indoor locations where windows allow light to be emitted to the exterior) where lights could be visible from natural habitats. Use of monochrome light sources not only virtually eliminates direct impacts of light pollution on invertebrates, but also prevents insects attracted to lights being a nuisance and hence avoids secondary impact of insects being deliberately killed to prevent irritation to personnel. NO white LED, mercury vapour, halogen, HPSV or any other lamp producing wavelengths shorter than 560 nm should be used where their emissions will be visible in natural habitats.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				- Use the minimum power lamps necessary to produce essential illumination levels. - Use motion-sensor triggers for security lighting to minimise the duration for which light is emitted. - Direct all exterior lighting appropriately to illuminate only the desired area and/or shielded so as to eliminate spill into areas where lighting is not required.	
Dust pollution impacts on invertebrates	Dust pollution impacts on invertebrates by clogging respiratory structures, reducing feeding efficiency, and altering habitat conditions, which can lead to stress, reduced survival, and population declines.	O	High (B, T)	Institute strict dust control measures on unpaved roads; tar or pave permanent roads.	Low (B, T)
Direct mortality of fauna due to decommissioning activities	Direct mortality of fauna due to decommissioning activities occurs when animals are unintentionally killed during site closure processes such as dismantling, clearing, or heavy machinery use, leading to local population declines and habitat disruption.	D	Very High (B, T)	- All construction vehicles should adhere to a speed limit of maximum 30 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. - Any excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Excavations should only be dug when they are required and should be used and filled shortly thereafter. Limiting the closure and rehabilitation activities to the footprint areas only. Avoid entry/access to previously undisturbed or already rehabilitated areas.	High (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				Areas other than the footprint areas and existing surface infrastructure areas, should be declared as 'no-go' areas to vehicles (only). All essential operational staff – machinery must be limited to development area (no need to go outside the authorised area).	
Habitat degradation that drives displacement and longer-term population effects and persistence of post-decommissioning disturbance	Habitat degradation that drives displacement and longer-term population effects, along with the persistence of post-decommissioning disturbance, reduces habitat quality and forces species to relocate, ultimately weakening population stability and ecosystem resilience over time.	D	Very High (B, T)	- All hazardous materials, if any, should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner. - The rehabilitated areas must be revegetated with indigenous vegetation - Implementation of a closure / rehabilitation plan from the onset of the operation of infrastructure. Rehabilitation must be conducted concurrently. The rehabilitation must be reviewed every 3 years and amended accordingly. - Monitoring of rehabilitation implementation on an annual basis for 5 years post-closure. The plan and interventions must be amended accordingly. - All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.	High (B, T)

10.4.10 FLORA

The following preliminary impacts have been identified for the Flora aspect. The detailed report is included in **Appendix G.10**. Table 10-12 outlines the summary of the impacts identified and their significance.

Table 10-12 – Flora Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Reduction in populations of threatened plant species	Reduction of SCC plant populations through direct loss of individuals, direct habitat loss, disturbance of areas important for metapopulation dynamics, disruption of pollination and/or dispersal vectors, increased mortality, and fragmentation of habitats, thereby exacerbating existing conservation pressures and compromising the long-term viability of sensitive species.	C	Moderate (B)	- Restricting development to the smallest feasible footprint and avoiding sensitive habitats such as wetlands, freshwater seeps, mobile dunes, dense thicket and dune forest. Maintain ecological corridors and buffers, particularly coastal–inland linkages, to preserve habitat connectivity and ecological function. Rehabilitate temporarily disturbed areas using locally indigenous species. - At Thyspunt, one protected tree species (<i>Sideroxylon inerme</i>) occurs in relatively high numbers in the study area and will require a permit for removal.	Low (B)
			High (T)		Moderate (T)

10.4.11 TERRESTRIAL BIODIVERSITY

The following preliminary impacts have been identified for the Terrestrial aspect. The detailed report is included in **Appendix G.9**.



Table 10-13 outlines the summary of the impacts identified and their significance.

Table 10-13 – Terrestrial Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
No-go	Development pressure and impacts due to alien invasive species in the event that no development takes place and limited controls are put in place to prevent these impacts.	O	High (B, T)	Mitigation is assumed to be tighter control on future development, as well as rigorous control of alien invasive plant species.	Low (B, T)
Impacts on critical biodiversity areas	Loss of habitat within areas that are within mapped CBA areas. This affects the entire provincial conservation plan since the plan is based on a least-cost allocation, and alternative sites are therefore required to meet conservation targets.	C	High (B, T)	- All measures to minimise the extent of impacts on habitats, as well as to rehabilitate disturbed areas. A comprehensive rehabilitation plan is required to be implemented that includes monitoring measures. An alien invasive management plan is required to be implemented that includes monitoring. - Offsets may be required to locate alternative sites to include in the CBA network. Engagement with relevant authorities is required to investigate options.	High (B, T)
Impacts on threatened ecosystems	Loss of habitat within areas that are within mapped threatened ecosystems.	C	Very High (B) High (B)	- All measures to minimise the extent of impacts on habitats, as well as to rehabilitate disturbed areas. A comprehensive rehabilitation plan is required to be implemented that includes monitoring measures. An alien invasive management plan is required to be implemented that includes monitoring. - Offsets may be required according to legislation for any impact of Medium or higher.	Very Low (T) Very Low (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Impacts on protected areas	Loss of habitat within areas that are within designated protected areas.	C	Very High (B) Very Low (T)	- All measures to minimise the extent of impacts on habitats, as well as to rehabilitate disturbed areas. A comprehensive rehabilitation plan is required to be implemented that includes monitoring measures. An alien invasive management plan is required to be implemented that includes monitoring. - A legal process may be required to de-proclaim the protected area.	High (B) Very Low (T)
Disruption of ecosystem processes	Excavation of material during construction and obstruction of sand movement during operation will change ecosystem-wide processes leading to permanent ecological changes.	C	Very High (B, T)	- A better understanding of hydrological processes is required to understand the possible impact. - Rehabilitation of disturbed areas will be required to stabilise sand movement close to the completed project. Where possible, infrastructure must not cross prevailing sand movement corridors. - In the event that the project is approved, it is recommended that a comprehensive long-term ecological study is undertaken across the entire ecosystem in order to monitor future changes due to the project. This may not mitigate impacts but would be invaluable scientific information for understanding this and other similar ecosystems.	High (B, T)
Establishment and spread of alien invasive plant species	Impacts due to alien invasive species (displacement of indigenous species, change	O	High (B, T)	Rigorous control of alien invasive plant species. Implementation of alien	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	in soil properties, artificial stabilisation of sand, change in fire regimes).			invasive management plan, including long-term monitoring.	

10.4.12 AQUATIC ECOSYSTEMS

The following preliminary impacts have been identified for the Aquatic Ecosystems aspect. The detailed report is included in **Appendix G.7**. Table 10-14 outlines the summary of the impacts identified and their significance.

Table 10-14 – Aquatic Ecosystems Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Wetland loss and/or degradation	Wetland loss and/or degradation as a result of both design, construction and operational phase impacts.	C, O, D	High (B) Very High (T)	Bantamsklip - Establishment of the area north of the R43 as a no-go area for all NPP-associated activities, other than alien plant clearing and management. - Confirmation that the modelled radius of draw-down for the NPP site would not extend north of the R43 and inclusion of engineering design approaches that will limit the radius of draw-down to the area south of the road. - Inclusion of allowance for faunal underpasses under the R43, particularly at the Haelkraal River crossing, where extended large culverts could be included. - Declaration of the area north of the R43 as a formal Nature Reserve in	Moderate (B) High (T)
Wetland conservation	Wetland and associated ecosystem conservation as a result of exclusion of sensitive wetland areas from development layouts and inclusion of additional areas outside of the proposed development footprint as conservation areas.	O, D	Moderate + (B, T)		Very High + (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				perpetuity and ring-fencing adequate funds for its ongoing maintenance. ■ Compilation of a Reserve Management Plan that details management requirements, responsibilities and land uses for the area that complement ecosystem conservation objectives. ■ Ring-fencing adequate funding for decommissioning, including adherence to a detailed rehabilitation plan (to be compiled during detailed design for the site, if authorised in the EIA process). Thyspunt ■ Attention to the design of all access roads to ensure that they: ■ Do not cross through or even pass within the same side of the high dunes containing the Langefonteinvelei. ■ Avoid all wetland areas unless with specific comment from the wetland ecologist indicating a low significance impact. ■ Are setback from wetlands by at least 50 m. ■ Are bridged when crossing the watershed between the Langefonteinvelei system to the west and the Eastern Valley Bottom wetland to the east. ■ Do not interfere in the movement of sands along the Oyster Bay dunefield – this could also require bridging. ■ Allow for faunal underpasses where necessary to ensure that overall biodiversity in the important Oyster Bay	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				dunefield and Eastern Valley-Bottom wetland systems are not impacted. ■ Attention to the design and alignment of transmission lines such that their impact on dune function and associated wetlands and general biodiversity function is minimised (ideally to negligible levels) – this would include omission of maintenance roads under these lines, with access for repairs or maintenance rather allowed for by helicopter or controlled quad-bikes over natural dune surfaces. ■ Attention to the design of the NPP building space to ensure that there is a zero probability of construction-phase catastrophic failure through liquefaction. ■ Confirmation of the modelled radius of draw-down for the site, based on SRK (2011-2013) to improve confidence in assigning a negligible significance rating to this impact from an aquatic ecosystems perspective and development of engineering design approaches that will limit the radius of draw-down during construction and dewatering. ■ Provision of minimum setbacks of at least 220 m from the Langefonteinvele wetland for all built infrastructure and construction activities including stockpiles, laydown areas and spoil storage. ■ Provision of minimum setbacks of at least 150 m from the upstream edge of all coastal seeps for all built	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				infrastructure and construction activities including stockpiles, laydown areas and spoil storage. - Conservation of dunes that act as ecological support areas for wetlands including the coastal seeps, hence: No development should extend north beyond the southern toe of the high dune that forms the southern boundary of the Langefonteinvelei – existing developments in this area could be retained provided that there is no change in their existing footprint including no change in hardened surface area. The low dune immediately north of the coastal seeps must be retained and should be protected from construction phase activities. - Provision of minimum setbacks of at least 100m from all wetlands identified in the area north of the Oyster Baty dunefield – this has implications for the proposed siting of the HV Yard – these measures may be amended subject to on-site ground-truthing, with an understanding of specific development plans and footprints for this area. - Development of an effective engineering design to ensure the upstream diversion and downstream re-spread of groundwater flows, such that the highly probably changes in flows into downstream dependent coastal seep wetlands are minimised – these downstream spreading / dissipation	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				measures would need to be in place before any upstream diversion / dewatering takes place, to prevent saltwater intrusion. ■ The NPP platform should be located as far east as possible (while avoiding the Langefonteinvelei to the north), to reduce the extent of its impact on coastal seeps, which occur primarily towards the west. ■ The seawater outlet channel should be piped or lined so as to prevent saltwater contamination of coastal seeps. ■ A stormwater management plan must be developed that shows how water quality and water quantity impacts to downstream receiving areas would be managed so as to prevent erosion or ecological responses to pollution / changes in water quality. ■ Monitoring of surface and groundwater quality in areas downslope / downstream of any nuclear waste storage areas must be implemented – these areas must be designed so as to minimise the possibility of leachate, including lining as required. ■ Details for the treatment of sewage and quality and disposal of treated effluent must be provided and should ensure no impacts to areas of conservation concern. ■ Construction phase mitigation would be critical to prevent aquatic ecosystem degradation and would need to adhere to strict no-go areas that included	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				fencing off of extensive areas of sensitive wetland and terrestrial habitat along roads during their construction as well as allowance for rehabilitation of disturbed areas and management of haulage of material onto and off the site so that disturbance and degradation impacts are limited. Construction phase mitigation and management should include, inter alia, attention to: Ensuring that sea water is not used for dust suppression outside of the actual NPP footprint – it should not be used along roads or transmission line construction zones. Treated effluent / other sources of nutrient-enriched water should not be used for dust suppression outside of the NPP footprint. Stockpiles must be sited and managed such that they do not result in contamination of any areas of conservation concern. - Ring-fencing adequate funding for decommissioning, including adherence to a detailed rehabilitation plan (to be compiled during detailed design for the site, if authorised in the EIA process. - Securing of all intended Eskom owner areas, and: Declaration of all areas outside of the access roads and NPP building platform and HV yard area as a formal Nature Reserve in perpetuity.	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				Ring-fencing adequate funds for ongoing maintenance including alien clearing. Exclusion of agriculture, mining and windfarm expansion from these areas. Compilation of a Reserve Management Plan, that details management requirements, responsibilities and land uses for the area that complement ecosystem conservation objectives.	

10.4.13 MARINE ECOLOGY

The following preliminary impacts have been identified for the Marine Ecology aspect. The detailed report is included in **Appendix G.12**. Table 10-15 outlines the summary of the impacts identified and their significance.

Table 10-15 – Marine Ecology Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Intertidal habitat loss and disturbance	Bantamsklip The loss of subtidal and intertidal habitat is unavoidable for the proposed project activities. While the intertidal and subtidal habitats of Bantamsklip are considered typical of the South Cape coast and are not considered of particular sensitivity or ecological significance, the placement of this infrastructure within an EBSA or within delineated Endangered/Vulnerable habitats results in a High significance rating.	C	High (B, T)	Placing infrastructure outside of CBA or Vulnerable habitats.	Low (B, T)
Subtidal habitat loss and disturbance		C	High (B, T)		Low (B, T)
	Thyspunt				

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	The loss of subtidal and intertidal habitat is unavoidable for the proposed project activities. Impacts on the benthos are linked to the physical disturbance of the substratum, resulting in habitat loss and mortality of fauna. Recovery time varies according to sediment particle size (in soft sediment systems) and the prevailing current strength, with a longer recovery period expected for coarse sediments and a stronger prevailing current. Some infrastructure placed sub tidally will eventually be buried, but all infrastructure is expected to be recolonised through the migration of adults from neighbouring populations by currents and tides (Newell et al. 1998). Following the termination construction, the impacted area usually recolonises rapidly as opportunistic taxa associated with disturbed environments (e.g., surface deposit feeders) settle. As the community reaches equilibrium, short-lived species are succeeded by long-lived taxa. While the intertidal and subtidal habitats of Thyspunt are considered typical of the South Cape coast and are not considered of particular sensitivity or ecological significance, the placement of this infrastructure within CBA Natural habitat or within delineated Vulnerable habitats results in a High significance rating.				
Pelagic open water habitats disturbance	Pelagic open water habitat disturbance alters the physical and chemical conditions of the marine environment, disrupting feeding, migration, and breeding patterns of species that rely on these ecosystems.	C	Moderate (B) Low (T)		Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Smothering impacts on benthic fauna in sediment disposal area	Smothering impacts on benthic fauna in sediment disposal areas occur when deposited sediments cover the seabed, suffocating organisms, reducing habitat quality, and disrupting ecological functions.	C	Moderate (B, T)	Bantamsklip Any disposal of sediment offshore will require a Dumping at Sea permit. It is critical that the toxicity of the sediment be assessed prior to discharge to ensure full assessment of potential impacts on marine biota and habitats at and adjacent to the dump site.	Low (B, T)
Turbidity impacts of sediment disposal on pelagic fauna	Turbidity impacts of sediment disposal on pelagic fauna reduce water clarity, impairing feeding efficiency, navigation, and respiration, which can stress populations and disrupt ecological balance in open water habitats.	C	Low (B, T)		Low (B, T)
Turbidity and smothering impacts of sediment disposal on squid stock and fishery	Thyspunt Key risks to the chokka squid fishery at Thyspunt arise from increased turbidity, sediment plumes, and smothering of spawning substrates related to disposal of excavated sediment offshore. Since spawning aggregations occur close to shore and the fishery operates intensively in this area, any disposal of sediment offshore will require a Dumping at Sea permit. It is critical that the toxicity of the sediment be assessed prior to discharge to ensure full assessment of potential impacts on marine biota and habitats at and adjacent to the dump site.	C	Very High (T)	- Protecting spawning events and maintaining suitable spawning habitat conditions. - All high-turbidity activities (e.g., construction and disposal of excavated sediment) should occur outside peak chokka squid spawning periods. Along the Eastern Cape coast, spawning peaks typically occur in spring–summer (roughly October–March), although spawning may occur year-round. Site-specific timing should be confirmed with DFFE fisheries data and liaising with local fishers. - In addition, efforts should be made to minimise sediment plumes wherever possible, even outside of chokka spawning seasons.	Moderate (T) (dumping) Very Low (T) (no dumping)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				Preferably, alternative uses should be found for the excavated sediment, and it should not be disposed of offshore.	
Below water noise impacts	Bantamsklip Both above water and below water noise are of concern at the Bantamsklip site, due to the relatively close proximity of the Dyer Island seabird colonies (in particular, the colonies of Critically Endangered African Penguin). Thyspunt Underwater noise impacts may affect various biota, including marine mammals, sea turtles, fish and diving birds (gannets and cormorants). Marine invertebrates may also be impacted by underwater noise (Solé <i>et al.</i> 2023) but that these impacts are considered limited in nature (de Soto 2016). The main adverse impacts of underwater sound on marine species can be broadly summarised as physical/physiological effects (e.g., mortality, non-recoverable injury, permanent threshold shift (PTS) in hearing, temporary threshold shift (TTS) in hearing, recoverable injury), or behavioural responses (e.g., stress, changes in movements, migration, feeding, breeding, displacement, disturbance) (Bailey <i>et al.</i> 2010). Long term noise exposure may cause chronic effects, including developmental deficiencies and physiological stress (Popper & Hawkins 2016). Potential impacts on marine fauna from underwater noise depend on the noise source itself (the loudness and frequency), the attenuation of the noise in the specific location,	C	High (B, T)	A noise modelling assessment should be undertaken to quantify the area of impact and should be used to inform mitigation measures. This includes: Deployment of Marine Mammal Observers. Restriction of blasting time of time/number of charges per day/season. Soft-start procedures.	Moderate (B)
					Low (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	the distance from the sound source to the receptor species but also the sensitivity of the species under assessment (i.e. hearing range sensitivity of adults vs juveniles etc.) (Hastings & Popper 2005). Construction is likely to involve very loud noise (both impulsive and non-impulsive) from drilling, blasting and pile driving, and given the likely presence of sensitive cetaceans and fish in the area.				
Impacts to marine biota due to brine discharge	The primary purpose of desalination is the separation of dissolved salts and other solutes from the fresh product water. As such, the primary impacts on marine environments associated with desalination plants are associated with negatively buoyant, highly saline brine discharge. All marine organisms have a range of tolerance to salinity, which is related to their ability to regulate the osmotic balance of their individual cells and organs to maintain positive turgor pressure. Salinity changes may affect aquatic organisms through direct toxicity, which initiates physiological changes (particularly osmoregulation), and indirect toxicity by modifying species distributions. Salinity changes can also cause changes to water column structure (e.g., stratification) and water chemistry (e.g., dissolved oxygen saturation and turbidity). Behavioural responses to changes in the salinity regime can include escaping in the case of mobile animals such as fish and macrocrustaceans, or avoidance by sessile animals (e.g., barnacles and mussels) by closing shells or by retreating deeper into	C	High (B, T)	- Placement of infrastructure (both the pipeline and plume) to avoid CBA Natural habitat or within delineated Vulnerable habitats. - Compliance with WQG limits at the edge of the designated mixing zone.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation															
	sediments. Sub-lethal effects of salinity stress can include modification of metabolic rates, change in activity patterns, or alteration of growth rates. The 1995 South African Water Quilty Guidelines (WQG) set an upper target value for salinity of 36 PSU (DWAF 1995), while the more recent limits are set at 10% above ambient (DFFE 2022). At levels exceeding 40 PSU, significant negative effects are expected (while the anticipated salinity concentration of the construction phase brine discharge is not currently known, but it is likely to fall above this).																			
Impacts on fisheries due to exclusion zones	Impacts on fisheries due to exclusion zones arise when fishing areas are restricted or closed, reducing access to resources and livelihoods for local communities while potentially altering fishery dynamics.	C	Low (B, T)		Low (B, T)															
(Re)mobilisation of oxygen depleting substances, nutrients and noxious substances from disposed sediment	The (re)mobilisation of oxygen-depleting substances, nutrients, and noxious substances from disposed sediment can lower water quality, cause oxygen depletion, and release harmful compounds that stress aquatic organisms and disrupt ecosystem balance.	C	Moderate (B, T)	Ensure compliance with limits stipulated below. <table><tr><th rowspan="2">Metal (µg/g or ppm dry weight)</th><th colspan="3">National Action List for dredge disposal (South Africa)</th></tr><tr><th>Warning Level</th><th>Level I</th><th>Level II</th></tr><tr><td>Arsenic (As)</td><td>42</td><td>57</td><td>93</td></tr><tr><td>Cadmium (Cd)</td><td>1.2</td><td>5.1</td><td>9.6</td></tr></table>	Metal (µg/g or ppm dry weight)	National Action List for dredge disposal (South Africa)			Warning Level	Level I	Level II	Arsenic (As)	42	57	93	Cadmium (Cd)	1.2	5.1	9.6	Low (B, T)
Metal (µg/g or ppm dry weight)	National Action List for dredge disposal (South Africa)																			
	Warning Level	Level I	Level II																	
Arsenic (As)	42	57	93																	
Cadmium (Cd)	1.2	5.1	9.6																	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation																								
				<table><tr><td>Copper (Cu)</td><td>110</td><td>230</td><td>390</td></tr><tr><td>Chromium (Cr)</td><td>250</td><td>260</td><td>370</td></tr><tr><td>Mercury (Hg)</td><td>0.43</td><td>0.84</td><td>1.5</td></tr><tr><td>Nickel (Ni)</td><td>88</td><td>140</td><td>370</td></tr><tr><td>Lead (Pb)</td><td>110</td><td>218</td><td>530</td></tr><tr><td>Zinc (Zn)</td><td>270</td><td>410</td><td>960</td></tr></table>	Copper (Cu)	110	230	390	Chromium (Cr)	250	260	370	Mercury (Hg)	0.43	0.84	1.5	Nickel (Ni)	88	140	370	Lead (Pb)	110	218	530	Zinc (Zn)	270	410	960	
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Zinc (Zn)	270	410	960																										
Above water noise impacts	Bantamsklip Both above water and below water noise are of concern at the Bantamsklip site, due to the relatively close proximity of the Dyer Island seabird colonies (in particular, the colonies of Critically Endangered African Penguin). Above water noise pollution affects birds in a number of ways, including direct physical impacts (damage to hearing), stress, fright-flight and avoidance responses. There are also potential behavioural impacts, including changes in foraging, reproductive success, communication and potential decreased response to audible alerts (from, for example, predators) (Ortega 2012).	C	High (B) Low (T)	■ Ensure adequate setbacks from sensitive receptors and incorporate noise barriers and/or enclosures (e.g., vibration isolators and acoustic enclosures) around machinery and equipment to reduce sound oscillation. ■ A noise modelling assessment should be undertaken to quantify the area of impact and should be used to inform mitigation measures.	Moderate (B) Very Low (T)																								
Impacts of artificial lighting	Impacts of artificial lighting disrupt natural behaviours such as navigation, feeding, and reproduction in both terrestrial and aquatic	C	Moderate (B, T)	■ Reduce the lighting to a minimum compatible with safe operations whenever and wherever possible to reduce nocturnal faunal attraction; position light sources, if possible and	Low (B, T)																								

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	species, leading to ecological imbalances and reduced biodiversity.			consistent with safe working practices, in places where emissions to the surrounding environment can be minimised i.e., aim lighting downward rather than out to sea.	
Disturbance and/or mortality of marine life due to the intake of seawater for desalination	Disturbance and/or mortality of marine life due to the intake of seawater for desalination occurs when organisms are trapped, injured, or killed during water withdrawal, leading to population losses and disruption of marine ecosystems.	C	Moderate (B, T)	Horizontal intake of water; intake velocities kept below 0.15 m/s; avoid upper 1 m and lower 1 m of water column.	Low (B, T)
Impacts to marine biota due to discharge of desalination co-pollutants	Impacts to marine biota due to discharge of desalination co-pollutants arise when concentrated brine and associated chemicals alter water quality, causing physiological stress, reduced survival, and habitat degradation for marine organisms.	C	Moderate (B, T)	Ensure compliance with WQG limits at edge of delineated mixing zone.	Low (B, T) (WQG not met) Very Low (B, T) (WQG met)
Discharge of sewerage effluent	Discharge of sewerage effluent degrades water quality by introducing excess nutrients, pathogens, and pollutants, which can harm aquatic organisms, disrupt ecosystems, and pose risks to human health.	C	Moderate (B, T)	Ensure compliance with WQG limits at edge of delineated mixing zone.	Low (B, T) (WQG not met) Very Low (B, T) (WQG met)
Impacts of highly saline discharge water (brine) diluted with cooling water	Impacts of highly saline discharge water (brine) diluted with cooling water can elevate local salinity levels, stressing marine organisms, altering community composition, and degrading surrounding habitats.	O	Low (B, T)	Mitigation measures will be investigated as part of EIA phase.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Impacts of thermally elevated discharge water	Thermal impacts are of particular concern for once-through cooling ($\Delta T=12^{\circ}\text{C}$). Changes in water temperature can have a substantial impact on marine species and ecosystems, with the effects either influencing the physiology of the biota (e.g. growth and metabolism, reproduction timing and success, mobility and migration patterns and production); and/or influencing ecosystem functioning (e.g. through altered oxygen solubility). An increase in water temperature can have a substantial impact on aquatic organisms and ecosystems, with the effects influencing the physiology of the biota (e.g. growth and metabolism, reproduction timing and success, mobility and migration patterns, and production); and/or ecosystem functioning (e.g. through altered oxygen solubility) (Bamber 1995). For thermal barriers to be effective in limiting or altering migration paths of marine organisms, they need to be persistent over time and cover a large cross-sectional area of the water body (van Ballegooyen et al. 2005). Internationally, a number of studies have investigated the effects of heated effluent from coastal power stations on the open coast and have been used for previous cooling water assessments for other coastal power plants (van Ballegooyen et al. 2005). Work has been undertaken to assess impacts on the marine biota at the Thyspunt site, including the white mussel <i>Donax serra</i> , abalone <i>H. midae</i> , kelp <i>L. pallida</i> , mytilid mussels, rock lobster <i>J. lalandii</i> . Reported effects of thermal pollution include an increase in biomass of shallow water hake	O	Very High (B, T)	- Limits are set as the median value for a range defined by the 20th and 80th percentiles of the seasonal and/or event-driven distributions for the receiving system while the more recent limits are set at 10% above ambient (DFFE 2022). - It should be noted that outfalls of a similar nature to that being considered for the once-through cooling option for this study do exist in South Africa at present (e.g. Koeberg NPP in the Western Cape) and have also been proposed for other similar projects (including the Duynfontyn Nuclear 1 EIA and other coastal power plants). While this option was not considered a fatal flaw in this assessment, a design of this nature is not strictly accommodated within the existing guideline framework for discharge of effluent from land-based sources into the coastal environment (DEA 2014) and would therefore require motivation under the “exceptional circumstances” clause included in these guidelines	Moderate (B, T)
					High (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	Merluccius capensis and West Coast sole <i>Austroglossus microlepis</i> at 18°C, but no influence on chub-mackerel <i>Scomber japonicus</i> at temperatures less than 17.5°C (Macpherson 1991). In addition, 18°C was found to be the lower lethal limit reported for larvae and eggs of <i>galjoen</i> <i>Dichistius capensis</i> (Van Der Lingen 1994). This includes impacts on plankton and the pelagic food web. The 1995 South African WQGs recommend that the maximum acceptable variation in ambient temperature should not exceed 1°C at the edge of the mixing zone (DWAF 1995). Currently, limits are set as the median value for a range defined by the 20th and 80th percentiles of the seasonal and/or event-driven distributions for the receiving system while the more recent limits are set at 10% above ambient (DFFE 2022). It should be noted that outfalls of a similar nature to that being considered for the once-through cooling option for this study do exist in South Africa at present (e.g. Koeberg NPP in the Western Cape) and have also been proposed for other similar projects (including the Duynefontyn Nuclear 1 EIA and other coastal power plants). While this option was not considered a fatal flaw in this assessment, a design of this nature is not strictly accommodated within the existing guideline framework for discharge of effluent from land-based sources into the coastal environment (DEA 2014) and would therefore require motivation under the “exceptional circumstances” clause included in these guidelines.				

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Operational noise impacts	Bantamsklip Operational noise impacts during the operational phase are generated from infrastructure maintenance and equipment. Both above water and below water noise are of concern at the Bantamsklip site, due to the relatively close proximity of the Dyer Island seabird colonies (in particular, the colonies of Critically Endangered African Penguin). Thyspunt Noises are commonly generated from turbines, generators, cooling towers and other infrastructure (e.g., pumps, fans and auxiliary systems) during routine operations (Jongens 2010, Garrett <i>et al.</i> 2016). These sounds arise as a byproduct of mechanical function such as steam flows, mechanical vibrations, airflow through ventilation for pressure control and filtration as well as from intermittent activities (e.g., maintenance and vehicle traffic) (Jongens 2010). Noise levels can propagate into the surrounding environment, potentially affecting nearby communities and marine fauna. Underwater noise from coastal plants can transmit through cooling water intakes and discharges, potentially disturbing marine fauna such as fish and marine mammals by masking communication signals and altering foraging behaviours (Bailey <i>et al.</i> 2010, Crowell 2016, CBD 2022). Elevated noise levels may also induce physiological stress responses in sensitive species within the receiving marine environment.	O	Low (T)	- A noise modelling assessment should be undertaken to quantify the area of impact and should be used to inform mitigation measures. - Ensuring the NPP is equipped with adequate setbacks from sensitive receptors and incorporate noise barriers and/or enclosures (e.g., vibration isolators and acoustic enclosures) around machinery and equipment to reduce sound oscillation.	Low (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Disturbance and/or mortality of marine life due to the intake of seawater	The impacts of seawater abstraction on marine life can include entrainment and impingement. Entrainment occurs when organisms pass through intake structures and into the processing equipment (Pankratz 2004). Impingement occurs when larger marine organisms are trapped against intake screens by the velocity of the water (Bamber & Seaby 2004). While the significance of both impingement and entrainment is related to the location of an intake, impingement is primarily a function of intake velocity, and entrainment depends largely on the overall volume of water drawn into plant.	O	High (B, T)	- Intake structures should be positioned away from sensitive environments or areas with high species diversity or abundance, like rocky reefs, and should not draw in water from the upper one metre of the water column, as planktonic organisms tend to concentrate in this zone. - The intake should also avoid the bottom one metre of the water column to minimise intake of suspended sediment. - The horizontal extraction of water should aid in reducing fish entrainment as fish have been shown to avoid rapid changes in horizontal flow (Pankratz 2004). - There is a broadly accepted rule that water extraction (horizontal intake of water) velocities should not exceed 0.15 m/s to minimise debris and marine life impingement (Fedorenko 1991). Intake velocities can be reduced to the requisite 0.15 m/s through the use of footer valves — these increase the area of intake, resulting in a decrease in intake velocity to safe levels.	Moderate (B, T)
Potential impacts of co-pollutant discharges	The impacts of co-pollutant discharges (such as that of biocides) are also of concern for both cooling and desalination systems. Co-pollutants are often discharged to the receiving environment as a result of the extensive pre-treatment of source water required to prevent clogging and biofouling of plant infrastructure.	O	Moderate (B, T)	- Ensure compliance with WQG limits at edge of delineated mixing zone. - The concentrate must be discharged into a suitable area with adequate mixing and offshore dilution, and a sufficient distance from sensitive habitats.	Low (B, T) Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	Pre-treatment typically includes filtration (aided by the addition of coagulants), pH control, the addition of anti-scalants, biocide, cleaning-in-place (CIP) chemicals (weak acids and detergents) as well as neutraliser (if an oxidising biocide is used). Any residual chemicals or other additives used in pre-treatment are frequently co-discharged after dilution with the concentrate into the receiving environment (usually the sea). Another critical factor that also needs to be observed is that oxygen depletion in the effluent might also occur through the addition of sodium metabisulfite, an oxygen scavenger, should it be used as a neutralizing agent for chlorine to protect the membranes used in the desalination process (Hoepner & Lattemann 2003b). In general, the toxicity of the various chemicals most likely to be used in the pre-treatment and CIP process (with the exception of any chlorine biocides) is relatively low. A model determining the extent of discharge is recommended to assess whether limits are adhered to around the RMZ.			- Appropriate discharge design. - The removal of particulates from the backwash sludge. - Neutralisation of strong acidic and alkaline solutions. - Properly considered dousing regimes.	
Potential impacts of exclusion areas on biodiversity	The long-term, highly legislated exclusion areas inherent to the development of a NPP site will likely have long term, positive knock-on benefits for marine biodiversity, due to exclusion areas becoming de facto 'protected area'. These types of exclusion areas are considered excellent Other Effective Area-Based Conservation Measures (OECMs) candidates. OECM is a term that refers to areas conserving biodiversity that exist outside	O	High (B, T)	No practical mitigation possible.	NA (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	the formal protected area network and may not be primarily managed for conservation. OECMs are geographically defined areas that deliver effective and sustained in-situ biodiversity conservation outside of formally declared protected areas, in accordance with CBD Decision 14/8 and relevant national legislation. These 'other' management measures include, for example, community-conserved areas, fishery closure areas or government-restricted areas (as would be the case for the Thyspunt NPP exclusion area). Such OECMs are considered complementary to MPAs as part of South Africa's commitments under the Kunming–Montreal Global Biodiversity Framework (GBF) 30x30 target (Kowalski & Smith 2025). South Africa currently protects only 5.4% of its mainland Exclusive Economic Zone through formal MPAs, underscoring the importance of alternative and complementary mechanisms, such as OECMs. Exclusion zones will be legislated and therefore exploitative pressures will be removed. These secondary positive impacts are synonymous with NPP developments elsewhere, globally (Jonas <i>et al.</i> 2024). Bantamsklip Exclusion zones around the proposed Bantamsklip NPP are expected to have limited impacts on the line fishery, small pelagic fisheries, and kelp harvesting within the concession area. Shore-based and line fish operations may experience minor spatial displacement, but the coastal fishery is broadly				

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	distributed, and most productive grounds lie outside the exclusion area, so effects on catches are expected to be minimal. Small pelagic species, which are highly mobile and fished primarily offshore, are unlikely to be affected in any measurable way. Kelp harvesting within the immediate concession footprint may be slightly reduced where exclusion zones overlap with accessible beds, but overall impacts are minor and localised, with negligible effects on regional production. Thyspunt The establishment of marine exclusion zones around the proposed NPP site at Thyspunt is expected to result in localised impacts on the commercial chokka squid fishery in South Africa due to the loss of access to fishing grounds that are intensively used close to shore. Although the exclusion area will likely represent a relatively small proportion of the total south coast squid fishing grounds, it overlaps with productive spawning and fishing areas, meaning vessels operating from nearby ports may experience displacement of effort this fishery operates close to shore at certain times of the year). The highly mobile nature of squid and the broad distribution of spawning activity along the south coast mean that regional catch levels are unlikely to be substantially affected, as fishing effort can shift to adjacent areas. However, localised impacts may still occur, particularly for smaller operators who rely on proximity to productive grounds. Consequently, while stock-level impacts are expected to be limited, socio-				

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	economic effects on the local fishery may be of moderate significance and require consideration in mitigation and management planning. To a lesser extent, line fishing that is conducted from, or close, to shore, may also experience a small impact from these exclusion zones.				
Potential impacts of exclusion areas on fisheries		O	High (T)	No practical mitigation possible.	NA (T)
Potential impacts of exclusion areas on fisheries and mariculture		O	Moderate (B)	No practical mitigation possible.	NA (B)
Potential Unplanned Events					
Spillage of hazardous substances on marine biota	There is a risk of spillage of a variety of hazardous substances during the use of machinery and construction vehicles. For example, spillage may occur as a result of fuel or oil leaks or during refuelling, and these substances could then be washed into marine system. Hydrocarbons are toxic to aquatic organisms and precautions must be taken to prevent them from contaminating the environment.	C, O, D	Low (B, T)	- Implementation of a rigorous environmental management and control plan to limit ecological risks from accidents. - All fuel and oil must be stored with adequate spillage protection. - Intentional disposal of any substance into the aquatic environment must be strictly prohibited, while accidental spillage must be prevented, contained, and reported immediately.	Very Low (B, T)
Unintentional discharge of polluted groundwater	Should groundwater contamination occur, there is a possibility at both sites for the discharge of organic, bacterial and	C, O	Low (B, T)		Very Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	hydrocarbon contaminants into the marine environment via polluted ground water (Griffiths <i>et al.</i> 2016). Contamination may occur from leaks and spillages from both on-site sanitation facilities, as well as from fuel, oil and grease storage facilities (Griffiths <i>et al.</i> 2016).				
Collision risk due to increased vessel presence	The proposed development will result in an increase in vessel traffic during the construction phase with a corresponding increased risk of potential collision with marine megafauna. Several cetacean species do occur within the coastal waters off both Thyspunt and Bantamsklip, both as resident and migratory populations. An increased risk of collisions with turtle species that may occur in the area is also of concern. The largest concern is the potential for impacts with Critically Endangered African penguins, given the proximity of the Dyer Island colony with the Bantamsklip site. Overall, however, relative to the total number of vessels operating along the southern Cape coastline, construction at both sites represents a relatively small increase in total vessel traffic.	C	Low (B, T)	- Requirements for education and awareness with vessel crews about collision risks. - Undertaking risk assessments to identify potential hazards associated with increased vessel traffic and develop contingency plans to mitigate the impacts.	Very Low (B, T)
Radiation emissions	A major concern associated with the development of any nuclear facility is the release of radiation emissions into the surrounding environment. In South Africa, the NNR controls radiation emissions released into the environment. As such the proposed plant will be legally required to meet the NNR's dose limits prior to approval. It is important to note	O	Low (B, T)	- Compliance with NRR limits. - While such emissions are highly unlikely, it is essential that monitoring of marine species (both sessile and mobile fauna) to assess compliance over time for levels of non-naturally occurring radionuclides.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	that, at no stage is there direct contact between the reactor and the coolant, or between the coolant and the seawater. Therefore, the most likely pathway for the release of radiation into the marine environment is through the release of contaminated cooling water. The dose limits allowed are, however, set by the NNR and the development will not be approved if these limits are not met by the plant. In the unlikely event of a nuclear accident affecting the marine environment, mortalities will be focused in the general area of the power station. Highly mobile species, such as fish or sharks, exposed to low to intermediate levels of radiation may, however, move great distances. This could pose a threat to public health if these fish were later consumed.				

10.4.14 AVIFAUNA

The following preliminary impacts have been identified for the Avifauna aspect. The detailed report is included in **Appendix G.11**. Table 10-16 outlines the summary of the impacts identified and their significance.

Table 10-16 – Avifauna Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Habitat destruction within the project footprint	Habitat destruction within the project footprint results in the direct loss of ecosystems and	C	High (B, T)	During the breeding season (August to December) cormorant breeding areas are considered No-Go areas. Outside	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	species, reducing biodiversity and ecological functions in the affected area.			of the breeding season, these areas are considered high sensitivity areas. - All High sensitivity areas must be avoided for high impact development. - Minimisation mitigation will be required for changes to project infrastructure design to limit the amount of habitat loss. - Demarcate work areas during the construction phase to avoid affecting outside areas. Use physical barriers and signage. - Do not clear areas of indigenous vegetation outside of the direct project footprint. - Minimise vegetation clearing to the minimum required. - Consult a fire expert and compile and implement a Fire Management Plan to minimise the risk of fires around the project site. - Compile and implement a Rehabilitation Plan from the onset of the project. - Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Surplus rehabilitation material can be applied to other others in need of stabilisation and vegetation cover. - Indigenous vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion (Beatty <i>et al</i>, 2017; Sinha <i>et al</i>, 2018).	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				- Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities. - Pre-construction environmental induction for all staff on site to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, remaining within demarcated construction areas etc.	
Destruction, degradation and fragmentation of surrounding habitats	Destruction, degradation, and fragmentation of surrounding habitats diminish ecosystem integrity by breaking up continuous habitats, reducing biodiversity, and impairing species movement and ecological functions.	C	High (B, T)	- Minimisation mitigation will be required for changes to project infrastructure design to limit the amount of habitat loss. - Demarcate work areas during the construction phase to avoid affecting outside areas. Use physical barriers and signage. - Do not clear areas of indigenous vegetation outside of the direct project footprint. - Minimise vegetation clearing to the minimum required. - Consult a fire expert and compile and implement a Fire Management Plan to minimise the risk of veld fires around the project site. - EO to provide supervision and oversight of vegetation clearing activities. - Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all areas of	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				construction. This includes wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources. ■ Solid Waste must be legally discarded off-site and not dumped into surrounding areas. ■ Suitable sanitary facilities to be provided for construction staff as per the guidelines in Health and Safety Act. ■ Temporary laydown areas should be clearly demarcated and rehabilitated subsequent to end of use. ■ Pre-construction environmental induction for all staff on site to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, remaining within demarcated construction areas etc. ■ A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment. ■ Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place.	
Displacement of avifaunal community (including several SCC) due to disturbance such as noise, light, dust, vibration	Displacement of avifaunal communities (including several SCC) due to disturbance such as noise, light, dust, and vibration disrupts feeding, breeding, and migration behaviours, leading to reduced habitat use and potential population declines.	C	High (B, T)	■ The increase presence of humans cannot be well mitigated against. Staff must be advised to not leave the boundary of the project footprint. ■ Implement a noise and light management plan, including restrictions on night-time work and use of low-impact lighting. ■ Noise must be kept to minimum and when possible, no construction activity is to occur during dawn to avoid impacts to the dawn chorus in the surrounding areas. ■ Any large-based noise or vibration disturbances (such as blasting) should be avoided entirely during August to December, in line with the Cormorant breeding season. ■ Generators used must have baffle boxes. ■ All construction vehicles should adhere to a speed limit of a maximum of 40	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				km/h to avoid collisions. Appropriate speed control measures and signs must be erected. A nest walkdown must be performed by an avifauna specialist prior to site clearance.	
Direct mortality from persecution or poaching of avifauna species and collection of eggs	Direct mortality from persecution or poaching of avifauna species and collection of eggs leads to immediate population declines, disrupts breeding success, and threatens the survival of vulnerable bird species.	C	High (B, T)	- A nest walkdown must be performed prior to clearance of the site, this is especially pertinent for the detection of SCC species nests. If nests are found a suitably qualified specialist must be contacted to advise on the way forward. - Immediately prior to the removal of vegetation, at least two (2) staff members must traverse the clearance area to create a disturbance so that species have the opportunity to vacate the area. - Any avifauna threatened by the construction activities should be removed safely by an appropriately qualified environmental officer or removal specialist. - All construction vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. - Poaching must be made a punishable offence, and any incidences must be reported to the relevant conservation body. - All personnel and contractors to undergo Environmental Awareness	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				Training. A signed register of attendance must be kept for proof of attendance. - Existing roads to be used as much as possible. - All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species, and owls, which are often persecuted out of superstition. Signs must be put up to enforce this. - All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof of attendance. Lines and servitude team should also be trained and have regular refresher awareness at least one every 5 years for team members who have been trained before and all new team members to be trained upon start as line technicians/managers.	
Thermal Pollution of Water	Thermal pollution of water occurs when heated discharges raise ambient water temperatures, disrupting aquatic ecosystems by reducing dissolved oxygen levels and stressing or displacing temperature-sensitive species.	O	High (B, T)	- Monitor water temperature and aquatic bird populations. - Establish a real-time water quality monitoring system with automated alerts for threshold exceedances. - Adjust operations to avoid critical periods for sensitive species.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Radiological Contamination (Accidental Release)	Radiological contamination from accidental release introduces harmful radioactive substances into the environment, posing severe risks to aquatic ecosystems, biodiversity, and human health through long-term exposure and bioaccumulation.	O	Low (B, T)	- Adherence to international nuclear safety standards. - Continuous environmental and radiological monitoring. - Conduct regular emergency response drills that include wildlife rescue and containment scenarios. - Emergency response plans for wildlife and habitat protection.	Very Low (B, T)
Destruction and degradation of surrounding habitats	Destruction and degradation of surrounding habitats reduce ecological integrity by eliminating vital resources, disrupting species interactions, and diminishing biodiversity in the affected areas.	O	High (B, T)	- Demarcate operational physical barriers and signage. - Do not clear areas of indigenous vegetation outside of the direct project footprint. - Minimise vegetation clearing to the minimum required. - Consult a fire expert and compile and implement a Fire Management Plan to minimise the risk of veld fires around the project site. - A Solid Waste Management Plan must be implemented, and solid waste legally discarded off site and not dumped into surrounding areas. - An Alien Management Plan must be compiled and implemented.	Low (B, T)
Bird Collisions with Cooling Towers and Large Structures and Other Associated Infrastructure	Bird collisions with cooling towers, large structures, and associated infrastructure cause direct mortality and injury, reducing avifauna populations and disrupting migratory pathways.	O	Moderate (B, T)	- All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution. - Install visual deterrents (e.g., UV-reflective markers) on all new and	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				existing tall structures, and review effectiveness annually. - Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used. - Fencing mitigations: Top 2 strands must be smooth wire. Routinely retention loose wires. - Minimum 30 cm between wires. - Monitor for collision incidents and adapt measures as needed for a two-year period. After this two-year period, monitoring can be assessed if it is still required.	
Bird Disturbance due to Increased or Chronic Light and Sound Pollution	Bird disturbance due to increased or chronic light and sound pollution disrupts natural behaviours such as feeding, nesting, and migration, leading to stress, reduced reproductive success, and displacement from critical habitats.	O	High (B, T)	- Use downward-facing, shielded, and low-UV lighting. - Oversee implementation and compliance with noise and light mitigation measures. - Establish and enforce noise level thresholds (e.g., <55 dB(A) at sensitive habitat boundaries) and monitor compliance using portable sound meters. - Schedule high-noise activities outside of August to December, in line with the Cormorant breeding season.	Low (B, T)
Direct mortality and disturbance from increased vehicle and human presence	Direct mortality and disturbance from increased vehicle and human presence reduce avifauna populations by causing collisions,	O	High (B, T)	Any avifauna threatened by the activities should be removed safely by an appropriately qualified environmental officer or removal specialist.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	habitat avoidance, and stress that disrupts feeding and breeding behaviours.			- Implement a long-term avifauna monitoring program to detect and respond to emerging risks. - All vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. - Poaching must be made a punishable offence, and any incidences must be reported to the relevant conservation body. - All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof of attendance. - Existing roads to be used as much as possible. - All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species, and owls, which are often persecuted out of superstition. Signs must be put up to enforce this. - All personnel and contractors undergo Environmental Awareness Training. A signed register of attendance must be kept for proof of attendance. Line and servitude team should also be trained and have regular refresher awareness at least one every 5 years for team members who have been trained before and all new team members to be	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				trained upon start as line technicians/managers. All waste and used products must be responsibly removed and disposed from site.	
Direct mortality due to earthworks, vehicle collisions and persecution	Direct mortality due to earthworks, vehicle collisions, and persecution reduces avifauna populations by causing immediate fatalities, disrupting breeding success, and diminishing local species abundance.	D	Moderate (B, T)	- All personnel should undergo environmental induction with regards to avifauna and awareness about not harming or collecting species. - Prior to commencing work each day, two individuals should traverse the working area in order to disturb any birds and so they have a chance to vacate. - Any avifauna threatened by deconstruction activities should be removed safely by an appropriately qualified environmental officer or removal specialist. - All construction vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. - All hazardous materials, if any, should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner.	Low (B, T)
Inability of avifauna species to immigrate due	Inability of avifauna species to immigrate due to continued habitat degradation restricts population recovery and genetic diversity by	D	Moderate (B, T)	Rehabilitation in accordance with the Rehabilitation Plan for the development must be undertaken in areas that have	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
to continued habitat degradation	preventing birds from accessing suitable habitats, leading to long-term declines in resilience and survival.			been modified during the Operational Phase and disturbed during the Decommissioning Phase. - Monitoring of the rehabilitated area must be undertaken at annually for 3 years after the decommissioning phase. - All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. - There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous flora. - Should the line be decommissioned that it must be removed as the collision risk persist long term.	
Radiological Contamination during Decommissioning	Radiological contamination during decommissioning can release residual radioactive materials into the environment, posing long-term risks to ecosystems, biodiversity, and human health through exposure and accumulation.	D	Moderate (B, T)	- Strict decontamination and site remediation protocols. - Continuous environmental and radiological monitoring. - Develop a post-decommissioning monitoring plan for avifauna and habitat recovery, with clear triggers for remedial action if contamination is detected.	Very Low (B, T)

10.4.15 SOCIO-ECONOMIC

The following preliminary impacts have been identified for the Socio-economic aspect. The detailed report is included in **Appendix G.14**.



Table 10-17 outlines the summary of the impacts identified and their significance.

Table 10-17 – Socio-economic Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Impacts Related to the Presence of Construction Workers	Due to the Large number of construction workers (10,000) and the duration of the construction phase (5-8 years), their presence will significantly alter the demographic and socio-economic profile of the affected towns. The presence of a large construction workforce (including contractor staff) is likely to result in a temporary but significant shift in the demographic and socio-economic profile of settlements within the Area of Influence. This may include population growth in towns, a higher proportion of working-age adults (often male-dominated), and increased household incomes for those directly employed. Secondary impacts may include pressure on rental accommodation and basic services, changes in local spending patterns and prices, and heightened risks of social tension where employment opportunities and associated benefits are perceived to be inequitably distributed between local residents and in-migrants. Construction workers also create a number of social risks, including an increase in crime, sexually transmitted diseases, gender-based violence, drug and alcohol abuse, and teenage and unwanted pregnancies. There is also the potential for an increase in prostitution and an increase in sexually transmitted diseases (STDs), including HIV. Given the significant number of construction workers and the duration of the construction	C	Very High (B, T)	- Develop and implement a Construction Workforce Management Plan. - Prioritise local hiring to reduce labour influx and manage employment expectations. - Use managed worker accommodation to avoid informal settlement formation and housing pressure. - Prohibit recruitment at the project gate to prevent uncontrolled job seeker influx and informal settlements. - Implement and strictly enforce a Worker Code of Conduct governing behaviour, community interaction, alcohol use, and respect for local people and customs. - Provide mandatory induction training for all workers on: - Gender Based Violence (GBV) - Sexual Exploitation and Abuse (SEA) - Sexual Harassment (SH) - Appoint dedicated Community Liaison Officers (CLOs) to manage day to day community–project interactions. - Maintain an effective Stakeholder Engagement Plan, including: - Accessible communication channels - Regular community updates - Maintain a functional grievance mechanism for influx related complaints. - Implement local skills development and training programmes to enable local residents to access construction employment opportunities.	High (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	phase, the project will put pressure on the local housing market and is likely to increase rental and housing costs, which, in turn, will negatively impact existing residents' ability to afford higher costs. Accommodating construction workers will place significant pressure on local services, such as water, sanitation, and refuse collection, as well as on the local municipality's ability to meet increased demand and the needs of existing residents. The impact will be exacerbated by the influx of job seekers. The transport of construction workers and construction material (including heavy-duty loads) will create traffic impacts on existing road users. Due to the scale of the project, the number of construction workers that will need to be transported to the site daily, and the duration of the construction phase, the potential traffic impacts are likely to be significant, especially given the current small size of the towns in the Areas of influence. Both sites are located in established tourism destinations. The social risks associated with the large number of construction workers, together with traffic-related impacts and changes in the socio-economic demographic profile of the study areas, are likely to negatively affect the areas' existing tourism offerings. There will be positive impacts on property values, an increase in demand linked to contractors and permanent workers. Also, negative impacts: rental costs increase as			- Coordinate with local authorities and SAPS to manage community health, safety, and security risks associated with workforce presence. - Undertake a Municipal Infrastructure Capacity Assessment (water, sanitation, health, education, waste) prior to peak construction to identify and manage pressure points. - Develop and implement social cohesion measures to reduce tensions between local residents and incoming workers. - Monitor workforce numbers, accommodation, and community impacts continuously and adapt mitigation measures as required.	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	contractors can afford to pay more, squeezing out local people. Negative impacts if the perception is created that the tourism offering, the area, and the town's sense of place are affected. Linked to the scale and nature of the project in an undeveloped, largely pristine area. The influx of construction workers and job seekers will also change the character of the towns, from quiet, coastal holiday/fishing towns to more industrial, working towns. Outside of the holiday seasons, most of the affected towns are quiet.				
Job creation	The construction phase is estimated to last 5-8 years. The number of employees during the construction phase is expected to be large, given the scale of the infrastructure to be constructed. At the local level, unskilled, semi-skilled, and skilled workers will be required for labour-intensive functions. Skilled and highly skilled labour will likely be sourced from the province or nationally, rather than locally. As a result of job creation, people in the local area surrounding the NPP will see improvements in their livelihoods. Local contractors may need to employ workers to support services required by the project. Hence, skills development initiatives may be necessary to upskill those entering the workforce without the necessary skills. Although the nature of most jobs during this phase is temporary, people employed will gain experience and stand a better chance of	C	Very High + (B, T)	- A Grievance Mechanism and SEP should be prepared and implemented before and during construction to communicate the project and the employment opportunities to the public and to manage negative impacts through the Grievance Mechanism. - A worker's Grievance Mechanism will also be required as per IFC Performance Standard 2. - The project should apply a 'locals first' policy, especially for semi-skilled and unskilled jobs. Most skilled positions, however, are likely to be filled by individuals from outside the area due to the area's low skill levels relevant to the project. - Special consideration should be given to communities near the project regarding the benefits arising from it, as they will be most affected.	Very High + (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	employment after working on the construction of the project. The increase in employees for the project will indirectly lead to more jobs for businesses providing services to the NPP construction, such as logistics, local public transport for employees, and more. The estimated workers are as follows: Construction 6 500 vendor construction workers 2 860 vendor staff 300 Eskom Project Staff 52 Eskom Consultants 700 off-site Operation 2 400 persons (on-site) Refuelling/Major Maintenance 1 000 persons			- Where possible, the hiring process should promote gender equality and women's employment. - The proponent should work closely with the municipality to establish a database of local companies, including BBBEE companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies, accommodation, etc.) before the commencement of the tender process for construction service providers. - These companies should be notified of the tender process and invited to bid for project-related work.	
	Long-term employment opportunities will be created during this phase of the project, with most positions requiring skilled and highly skilled personnel. These roles will primarily include engineers, technicians, and other technical specialists, supported by ancillary staff, including cleaners, security personnel, and maintenance teams. Skilled and highly skilled workers will benefit from long-term jobs during this phase, as it is expected to last approximately 40+ years. As noted, many of the jobs generated during the construction	O	High + (B, T)	- Apprenticeships, Learnerships, and/or internships could be used to provide locals with the experience they need to play a role in the Project. This could help reduce youth unemployment in the municipality. - Through partnerships with universities and TVET colleges, Eskom could equip local people with the appropriate skills to make them employable during the operational phase.	High + (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	phase are likely to be lost once the Project transitions into the operational phase. This is because the two phases require different skill sets: construction relies heavily on semi-skilled and unskilled labour, whereas the operational phase demands much greater specialised technical skills. In addition to direct employment, local businesses are expected to benefit indirectly during the operational phase, as ongoing demand for goods and services will support sustained employment and development within the local economy.			- Although job losses are inevitable at the end of the construction phase, a reasonable portion of local employees could be trained during the construction phase so they can transition and perform duties of the operational phase. - Employee benefits, such as the Unemployment Insurance Fund, could limit disruptions in livelihoods due to job losses after the construction phase ends. - Non-core services such as construction vehicle repairs and maintenance could be sought from local subcontractors.	
	Limited job creation is expected during this phase, as labour for dismantling the NPP is required. Rehabilitation of the site and environmental monitoring also require skilled labour. Some of the workers who were part of the operational phase could be transitioned into the decommissioning phase and trained to manage the work required for decommissioning. Jobs created during this phase are temporary and will end once rehabilitation is complete.	D	High + (B, T)	- A Grievance Mechanism and SEP should be prepared and implemented before decommissioning to communicate the employment opportunities. - The project should apply a 'locals first' policy, especially for semi-skilled and unskilled jobs. - Special consideration should be given to communities near the project regarding the benefits arising from it, as they will be most affected. - Where possible, the hiring process should promote gender equality and women's employment. - The proponent should work closely with the municipality to establish a database of local companies, including BBBEE companies, which qualify as potential service providers (e.g., construction	High + (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				companies) before the commencement of the tender process for decommissioning service providers. These companies should be notified of the tender process and invited to bid for Project-related work.	
Influx of job seekers	The unemployment rate of the Eastern Cape was 39.3% and 39.5% during the first and second quarters of 2025, respectively (Eastern Cape Socio Economic Consultative Council, 2025). An unemployment rate this high pose a challenge to areas which are developing. These areas will experience increased in in-migration due to real and perceived job opportunities. Consequently, the communities will be negatively affected as there will be an increased demand on infrastructure such as roads, municipal services to accommodate the rising population. Municipal services such as water, sanitation, refuse removal, and health care will have heightened pressures from both locals and people migrating to the Project area. In contrast, in the Western Cape, according to 2025Q4 stats, the province has an unemployment rate of 18.1%, which is the lowest in the country. The influx of job seekers does not guarantee employment as not everyone who migrates to the area will find jobs. As a result, there will be an increase in local unemployment. Health problems such as HIV/AIDS, STIs and STDs will also rise with the population increase. Due to changes in the social structures. There	C	Very High (B, T)	- An influx management plan should be developed, including: - Prioritising local hiring to minimise labour influx and manage employment expectations. - Using managed accommodation to prevent informal settlement and housing pressure. - Enforcing a code of conduct to manage behaviour and community interactions. - Managing community health, safety, and security risks linked to labour influx. - Maintaining stakeholder engagement and a grievance mechanism to address influx-related issues. - As part of onboarding construction workers, training should be provided on preventing GBV, Sexual Assault (SEA) and Sexual Harassment (SH). - The project must engage with communities using dedicated community liaison officers and have an effective SEP, including a grievance mechanism for communities to access and lodge complaints. - Local employment should be a priority for the construction contractor to lessen	High (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	could also be tensions between locals and new commers. Housing demand will also rise due to the increase in population. Consequently, informal dwellings could increase in the area. The rise of unemployed people in Thyspunt and/or Bantamsklip and surrounding areas may result in social challenges such as crime, Gender Based Violence (GBV), alcohol abuse, and prostitution. There could be possible delays in construction, causing this phase to last longer than anticipated. This could be good for the employees as their contracts may be extended for this period. It could also be good for local businesses as their services will be required for an extended period. There will be increased pressure on municipal and essential services such as healthcare, education and housing. There is also the potential for the disruption of social cohesion due to the influx of people from different backgrounds form the locals. Potential increased risk of social ills such as GBV, unemployment and crime, have the potential of reaching the 'limits of un-acceptable change'.			the number of workers away from their homes. ■ Training programmes must be implemented to enable local participants to take advantage of employment opportunities. ■ No recruitment should occur at the project gate to prevent informal settlements around the project site. ■ A municipal Infrastructure Capacity Assessment should be done to ensure that the influx of job seekers does not overwhelm municipal infrastructure relating to sanitation, water, health, and education facilities. ■ Social cohesion should be maintained to prevent rising tensions between pre-existing and newer arriving people.	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Associated infrastructure development	The project will require new and upgraded infrastructure. The construction of the NPP will require additional and upgraded roads for construction workers and construction vehicles. Upgrades will be needed on the existing roads. Such upgrades can include converting gravel roads to tarred roads, adding traffic lights, and mending potholes. The road upgrades will also benefit other road users, such as farmers, holidaymakers and permanent residents. This is particularly true of the Thyspunt site, as the existing roads are of poor quality, particularly the road to Oyster Bay. Although additional infrastructure will be built, there will be temporary pressure placed on the existing infrastructure, such as traffic congestion caused by construction vehicles during peak and off-peak hours. The municipalities will also need to provide additional schooling and health facilities. Measures to improve infrastructure will have a positive effect on the local areas, making them more accessible to people. The impact will be more positive in the Thyspunt area, as the area is less accessible than Bantamsklip.	C	High + (B)	- Road safety should be maintained by ensuring that construction vehicles have a recognised route, and they follow the road rules. - The municipality should approve the infrastructure associated with the project, such as external roads, to avoid contradicting the IDPs for the local municipality and district municipality. - The SEP must be implemented to ensure that communities are aware of any infrastructure to be added to the project. - The Grievance Mechanism should be implemented to deal with any issues that are related to the project infrastructure.	High + (B)
			Very High + (T)		Very High + (T)
Local economy	Considering the relatively high unemployment levels and few employment opportunities, there will be a localised economic benefit to the communities in the area. Local businesses have lower potential due to the regional financial diversification. Therefore, it is likely that contractors and engineering firms based outside of the municipality will benefit the most from the project. The service industry of	C	High + (B, T)	- The engineering, procurement, and construction contractor should prefer appropriate subcontractors in the surrounding communities, followed by those in the municipal area and those outside the province. - Give due notice to employees and businesses that will be affected by the	Very High + (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	Thyspunt and/or Bantamsklip will also be at an advantage. The potential prospects would relate to the site's transportation, security, cleaning, catering, and lodging for construction employees. The project will benefit the national, provincial, and local economies at different rates. The local economy will be boosted by increased demand for services such as accommodation, retail, recreation, and construction supplies. Local businesses can provide the project and its employees with the products and services required during construction. Goods and services will include construction supplies and contracting services like transportation, equipment rental, and skilled labour. Enabling the development of small and medium-sized enterprises. The local economy will benefit from the inclusion of local businesses in the project. Moreover, creating job opportunities will stimulate economic growth. As discussed, the project will contribute to the construction and upgrading of new and existing infrastructure, such as roads.			progression of the project to the operational phase. ■ The project could partner with local suppliers through procurement programmes to develop local suppliers. ■ Procurement programmes should prioritise local procurement for locally available goods and services. ■ Resources required during construction should be sourced, preferably from local businesses. Accommodation needed for contractors should favour local guesthouses and hotels.	
	The local economy will benefit during the operational phase, as approximately 2 400 workers will be employed. They all require goods and services from local businesses such as catering, accommodation and more. Other businesses will experience difficulties during the shift from construction to operation.	O	High + (B, T)	■ The project should prefer appropriate businesses in the surrounding communities, followed by those in the municipal area, then the province and then those outside the province. ■ Give due notice to employees and businesses that will be affected by the	Very High + (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	These businesses include local subcontractors who performed construction duties and businesses from which materials and services were sourced during the construction phase.			progression of the project to the operational phase. ■ The project could partner with local suppliers through procurement programmes to develop local suppliers. ■ Procurement programmes should prioritise local procurement for locally available goods and services. ■ Offer opportunities to local maintenance professionals where possible (electrical, civil, and mechanical work). ■ Ensure verification of local suppliers so that SMEs are notified of procurement opportunities and tenders. ■ Eskom should develop a database of local suppliers.	
Loss of agricultural land	The project is located within plots that form part of an agriculturally active area. The physical construction of the infrastructure discussed in the project description will require vegetation clearance. Eskom intends to develop a small portion of the area. A portion of the project will be within the farmlands. The Agricultural assessment found that the area to be developed by the project is of low agricultural potential. The report concludes, “the proposed development on the Bantamsklip or the Thyspunt coastal site is acceptable because it leads to negligible loss of future agricultural production potential” (Lanz, 2025). However, there could be impacts on neighbouring farmers, which will need to be mitigated.	C	Low (B, T)	■ The project should limit construction activities during planting and harvesting seasons. ■ Disturbed areas should be rehabilitated in the post-construction phase. ■ Preparation and implementation of a SEP before and during the construction phase. ■ The project should agree with the neighbouring local farmers in the area on how they will be compensated for damages if there are damages to farm infrastructure. Agreements should be entered into before the construction phase starts. ■ All farm gates must be closed after passing through these.	Very Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				- Contractors appointed by the project should provide daily transport for unskilled and semi-skilled workers to and from the site. This is to prevent workers crossing farmlands. - The project should hold contractors liable for compensating farmers and communities in full for any losses or damage to farm infrastructure or farm animals. - The project should implement a Grievance Mechanism that provides locals with an effective and efficient mechanism to address issues related to the project.	
Dust	Construction activities on the construction site will generate dust. Construction vehicles transporting sand and other materials on gravel roads and off-loading processes often scatter dust, leading to wind-blown dust affecting communities. However, the air quality assessment report finds that “There are no sensitive features on site and any no-go areas from an air quality perspective near the Thyspunt site” and “there are no sensitive features on site and any no-go areas from an air quality perspective near the Bantamsklip site” (Liebenberg-Enslin, 2025, p. 62). Air quality impacts during construction would be reduced through standard dust control measures, including limiting vehicle movement and speeds, applying water sprays to unpaved	C	Moderate (B, T)	- Water sprays on all unpaved roads used during construction. - Chemical suppressants on all temporary on-site roads. - Paving of all permanent on-site roads. - Water sprays at all operational areas where dust is generated by dozing and grading. - Cover temporary stockpiles. - Water sprays are used in the crushing and screening of aggregates.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	roads and cleared areas, reducing exposed surfaces, and stabilising stockpiles to minimise dust generation and wind erosion. (Liebenberg-Enslin, 2025).				
Noise	Although construction vehicles and equipment are noisy, it is not expected that this will be a major challenge during construction, as the social receptors are distant from the sites, as can be seen from the Area of Influence (Aoi). Bantamsklip Based on a desktop assessment, five sensitive receptors were identified around the Bantamsklip site, with the closest receptor located ~1.6 km from the proposed infrastructure. The noise-generating potential of the project is anticipated to be high; however, given the limited number of nearby receptors, the site sensitivity from a noise perspective is classified as “low”. Based on the use of the rating tool detailed in the acoustic report, the acoustic impacts of the project if located at the Bantamsklip site, are anticipated to be “moderate” to “low” (Collet, 2025). Thyspunt Based on a desktop assessment, 16 sensitive receptors were identified around the Thyspunt site, with many located directly on the site boundary. The project's noise-generating potential is expected to be high. With numerous nearby receptors identified, the site sensitivity from a noise perspective is classified as “high”. Based on the use of the	C	Moderate (B, T)	■ Installing acoustic enclosures for equipment causing radiating noise. ■ Improving the acoustic performance of constructed buildings by applying sound insulation. ■ Establishing noise deflection walls. ■ Ensuring equipment with the lowest sound power level specifications is selected for the project. ■ Ensuring equipment is properly maintained and installing suitable mufflers/silencers on engine exhausts, where practical. ■ Equipment must be suitably sized for the proposed task. ■ Locating noise sources in less sensitive areas to take advantage of distance and shielding.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	risk assessment/rating tool detailed in the acoustic report, the acoustic impacts of the project if located at the Thyspunt site, are anticipated to be “very high” to “high”. It is noted that these receptors will need to be confirmed in the EIA phase as residential in nature and inhabited. Some are currently leased by Eskom to outside parties, and these leases will be terminated before construction begins (Collet, 2025).				

	During the operations of the NPP, the following infrastructure will generate noise: ■ Turbines generate continuous mechanical and aerodynamic noise. ■ Diesel Generators have an operational noise level of 60 dB(A)¹. ■ Gas Turbines have operational noise levels of 85 dB(A) at 1 m from the package¹. Auxiliary Equipment ■ Includes pumps, compressors, Heating, Ventilation, and Air Conditioning (HVAC) systems, and other plant infrastructure. ■ Equipment associated with spent fuel handling and storage can generate noise. ■ Wastewater Treatment Works (WWTW) can generate noise ■ Mechanical equipment and pumps contribute to operational noise. Internal and Access Roads Vehicle movement and transport activities within the site could generate noise. Other Infrastructure Offices, canteens and auxiliary service infrastructure may have HVAC and other noise-generating systems. Bantamsklip Site Noise Impacts During Operations: The noise-generating potential is also high, but there are far fewer sensitive receptors, with the closest being about 1.6 km away. There are 5 identified sensitive receptors at Bantamsklip, all located farther from the site	O	Moderate (B, T)	■ Installing acoustic enclosures for equipment causing radiating noise. ■ Improving the acoustic performance of constructed buildings by applying sound insulation. ■ Establishing noise deflection walls. ■ Ensuring equipment with the lowest sound power level specifications is selected for the project. ■ Ensuring equipment is properly maintained and installing suitable mufflers/silencers on engine exhausts, where practical. ■ Equipment must be suitably sized for the proposed task. ■ Locating noise sources in less sensitive areas to take advantage of distance and shielding. ■ Implement a noise management plan if required by regulatory authorities.	Low (B, T)
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	(the closest is about 1.6 km away). These include: ▪ Edge of Pearly Beach Settlement ▪ Kleyn Hagelkraal Farm ▪ Two farmsteads ▪ Buffeljachtsbaai Public Library The lower number and greater distance of receptors at Bantamsklip result in a lower risk of significant noise impact. Thyspunt Site Noise Impacts During Operations: The noise-generating potential is high due to the presence of sensitive receptors (residences, farmhouses, and a lodge) located close to the site boundary. These include: ▪ Residences (to be confirmed as inhabited during the EIA phase) ▪ Farmhouses ▪ Oyster Bay Beach Lodge ▪ Edge of Oyster Bay Settlement These receptors are at risk of direct noise impact due to their proximity to the proposed plant. Anticipated operational noise impacts are rated as very high to high, posing a significant risk to community health and comfort.				
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Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Visual	The visual impact assessment considered the tallest and most prominent project components (the power plant, communications tower and meteorological mast) under a worst-case scenario, using expert judgement and accepted visual assessment techniques (Klapwijk, 2025). Bantamsklip Sensitive receptors include the village of Pearly Beach, a popular holiday destination, Buffeljachtbaai, a small settlement to the east of the site and Quoin Point. Several activities and institutions rely on the aesthetic environment, such as game farms, national parks, lodges, guesthouses, and several private nature reserves. These include Groot Hagelkraal Naturte reserve, Quoin Point Nature Reserve, Agulhas National Park, Uilkraalsmond Nature Reserve and Kleyn Kloof private nature reserve. Other sensitive receptors are travellers in the R43, which becomes the R317 and the road to Buffeljachtbaai. Dyer Island Provincial Nature Reserve lies about 15 km west of the site off the coastline. There are a few homesteads along this section of the coast. Most are around the Buffeljachtbaai village (Klapwijk, 2025). Construction activities, including vegetation removal, earthworks and road preparation, would negatively affect landscape character, visual quality and sense of place, resulting in a moderate change to key views at a local-to-regional scale, with the greatest impact	C	Moderate (B, T)	- Limit the area of disturbance for access roads and construction camp sites. - Locate construction camps and all related facilities such as stockpiles, lay-down areas, batching plants in areas already impacted such as existing farmyards or in unobtrusive locations away from the main visual receptors. - Limit access tracks for construction and maintenance vehicles to existing roads where possible. Once established do not allow random access through the veld. - Suppress dust during construction. - Blend edges of road and platforms with surrounding landscape. - Rehabilitate exposed disturbed areas. - Avoid vegetation stripping in straight lines but rather non-geometric shapes that blend with the landscape. - Limit need for security lighting. - Use non-reflective materials. - Paint all other project infrastructure elements such as operational buildings, support poles etc. a dark colour. - Avoid bright colour/patterns and logos.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	occurring on-site. Due to the scale of the NPP and the low visual absorption capacity of the receiving environment, mitigation measures are expected to have limited effectiveness, more so during operation (Klapwijk, 2025). Thyspunt The sensitive visual receptors include the western edge of Cape St. Francis, the private nature reserve Rebelsrus, travellers on the main roads such as the coastal road from St Francis Bay to Oyster Bay, R330, R102 and the N2 (Klapwijk, 2025).				
	Bantamsklip There would be high visual intrusion due to the large scale and height of NPP infrastructure in a flat, open coastal landscape with low visual absorption capacity. Direct visibility from sensitive receptors, including: ■ Pearly Beach (~7 km west) ■ Buffeljachtbaai (~6 km east) ■ R43/R317 road users ■ Several nature reserves and Agulhas National Park are within the viewshed Permanent change to sense of place, shifting from a remote, natural coastal character to an industrial landscape. Night-time visual impacts are significant due to: ■ Security lighting	O	High (B, T)	■ Lighting management. ■ Minimise security lighting to the absolute minimum. ■ Use downward-directed, shielded light fixtures. ■ Avoid high mast perimeter lighting; use motion-activated lighting where possible. ■ Reduce light spill beyond the site boundary. ■ Material and colour treatment. ■ Use non-reflective materials. ■ Paint buildings, poles and infrastructure in dark, muted colours that match the surrounding landscape. ■ Avoid bright colours, patterns and logos. ■ Landscape rehabilitation and maintenance. ■ Maintain rehabilitated areas to prevent visual scarring.	High (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	- Red aviation hazard lights on tall masts - Visibility over long distances in a dark rural sky Thyspunt Key visual impacts: High visual intrusion during operation due to the scale and mass of the NPP, despite partial screening by longitudinal dunes. Fewer sensitive visual receptors than Bantamsklip because: - Dunes largely screen Oyster Bay - Cape St Francis is ~11–12 km away, with reduced impact due to distance - Strong alteration of sense of place, from remote, unspoilt coastline to industrial character Night-time lighting impacts, including: - Security lighting - Red flashing aviation lights on masts visible over long distances.			- Blend cut-and-fill slopes with surrounding landforms. - Ensure long-term vegetation management does not create stark. - Ongoing involvement of a landscape architect during detailed design and operation to manage scale, form, colour and lighting integration.	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Spatial planning	Bantamsklip Bantamsklip is in a rural, low-growth area and not yet formally included in spatial frameworks for nuclear development. The site overlaps with protected and critical biodiversity areas, and environmental overlays tightly regulate development. Urban expansion near the site is not anticipated, and the risk of conflict with settlement growth is very low. However, formal inclusion in future planning documents is recommended for clarity and management. Both sites are expected to have low impacts due to their remote locations and strong planning controls. Thyspunt is preferred for immediate development because it is already integrated into planning frameworks, whereas Bantamsklip would require additional formal planning steps. Thyspunt Thyspunt is already included in local and district planning frameworks as a potential nuclear site. Strict land use controls are in place within a 16 km zone to prevent urban expansion, limit population growth, and manage risks. The site is buffered by conservation land, and any development proposals are subject to review by Eskom's Nuclear Sites Department. These controls minimise the impact on surrounding settlements, and the likelihood of incompatible development is considered highly unlikely.	C	High + (B, T)	- During the next MSDF review cycle, the Bantamsklip site must be included as a spatial proposal. - Thyspunt is already included in local and district planning frameworks as a potential nuclear site.	High + (B)
					Very High + (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Devaluation of property	The project could lead to the devaluation of properties within its vicinity. Reduced property values could be caused by the spread of informal settlements in the area, which causes visual impacts for residents and potential property buyers. People also do not want to live near informal settlements, as they are concerned about the perceived crime associated with them. The negative perceptions around living in proximity to an NPP could also devalue properties.	C	Moderate (B, T)	- Town planning should take place in collaboration with the local municipality to reduce the chances of informal settlements developing. - Buffer zones around the construction site should be enforced to ensure that no informal settlements are developed close to the site.	Moderate (B, T)
	Intrusive impacts associated with the project (e.g., traffic congestion, visual impacts) could lead to the devaluation of properties within the NPP area. Reduced property values could also be caused by increased need for housing and the spread of informal settlements in the area. Additionally, perceived dangers associated with nuclear energy can also discourage buyers and lower property demand in the real estate markets. The outward migration of people after the construction phase, estimated at 10 000 people, could also harm the real estate market, as there will be a surplus of homes.	O	High (B, T)	- Eskom needs to work with the municipality to select specific locations for employee housing. - Together with the municipality, ensure that there is enough housing for the influx of people in the area during construction. - Town planning should take place in collaboration with the local municipality. To reduce the likelihood of informal settlements developing. - Buffer zones around the NPP should be enforced to ensure that no informal settlements are developed close to the site.	Moderate (B, T)
Property values increase	There is also a likelihood that some property values will increase as construction workers look for accommodation. This would be true for villages like Pearly Beach and Oyster Bay (Thyspunt site), as they are situated close to the NPP construction sites.	C	Moderate + (B, T)	- Town planning should take place in collaboration with the local municipality. - Workers, particularly semi-skilled and skilled workers, should be encouraged to live close to the site.	High + (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				Buffer zones around the construction site should be enforced to ensure that no informal settlements are developed close to the construction site.	
Fisheries	During the construction phase at Thyspunt and Bantamsklip, fisheries are primarily affected by habitat loss and disturbance, increased turbidity and sediment plumes, underwater and above-water noise, and temporary exclusion of fishing activities. Excavation and offshore disposal of sediment pose a particular risk to the chokka squid fishery at Thyspunt, where smothering of spawning grounds is possible. At the same time, noise and disturbance are of greater concern at Bantamsklip due to nearby sensitive seabird and marine mammal areas (Anchor Environmental Consultants, 2025).	C	Moderate (B)	- Avoid sensitive habitats as far as possible. - Minimising the construction footprint. - Timing sediment disposal outside peak spawning periods. - Reducing or eliminating offshore dumping where possible. - Implementing noise controls and monitoring. - Ensuring compliance with water quality guidelines for any discharges.	Low (B)
			Very High (T)		High (T)
	During the operational phase, fisheries at both Thyspunt and Bantamsklip may be affected by seawater abstraction (entrainment and impingement of fish and larvae), thermal discharges from cooling water, brine and co-pollutant discharges from desalination, operational noise, and permanent marine exclusion zones. With appropriate design and controls, particularly low-velocity horizontal intakes, avoidance of surface and bottom waters, and strict compliance with Water Quality Guidelines for temperature, salinity, and chemicals, most operational impacts can be reduced to low or moderate significance. However, exclusion zones remain an unavoidable impact, resulting in a high	O	Moderate (B)	- With appropriate design and controls, particularly low-velocity horizontal intakes, avoidance of surface and bottom waters, and strict compliance with Water Quality Guidelines for temperature, salinity and chemicals, most operational impacts can be reduced to low or moderate significance. - However, exclusion zones remain an unavoidable impact, resulting in a high negative effect on the chokka squid fishery at Thyspunt and a moderate impact on linefishing, kelp harvesting and mariculture at Bantamsklip, for which no practical mitigation is	Moderate (B)
			Very High (T)		High (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	negative effect on the chokka squid fishery at Thyspunt and a moderate impact on line fishing, kelp harvesting and mariculture at Bantamsklip, for which no practical mitigation is available other than long-term monitoring and adaptive management (Anchor Environmental Consultants, 2025).			available other than long-term monitoring and adaptive management.	
Community health, safety and security	Community health and safety are described in IFC PS 4 (International Finance Corporation, 2012). The standard aims to minimise risks and impacts on local communities due to project aspects, such as workforce, equipment, and infrastructure. This includes risks related to accidents, hazardous materials, disease transmission, and interactions with security personnel. The standard emphasises the proponent's responsibility to avoid or minimise these risks, particularly for vulnerable groups, and acknowledges the role of public authorities in promoting community well-being. As discussed, the project could expose communities to social challenges such as increased crime and reduced sense of safety. An increase in crime affects locals' security by exposing them to potential criminal activity. There is an increased risk of STIs and STDs due to the increase in the local population as a result of the influx. Risk of STIs and STDs to communities needs to be mitigated through training and awareness creation for the workforce on the risk of spreading disease and how to prevent the spread of diseases. The construction site should be secured to prevent communities from accessing it and being	C	High (B, T)	▪ Mandatory training on STIs/GBV/SEA/SH for all workers. ▪ Enforce a strict worker Code of Conduct with zero tolerance for criminal behaviour. ▪ Strict rules should apply to any construction accommodation, such as not allowing children or prostitutes into the project accommodation. ▪ Provide on-site health services to construction workers (health screening, providing condoms, and awareness materials). ▪ Ensure security personnel are trained in the IFC PS4 requirements. Such as the appropriate use of force. ▪ Security personnel should also be screened for past criminal records or past human rights abuses. ▪ House workers in managed formal accommodation to avoid informal settlements. ▪ Coordinate with local police and community safety forums. ▪ Secure the construction site.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	exposed to dangerous equipment and construction vehicles.			Implement and maintain a community grievance mechanism for reporting safety concerns.	
Outward migration of construction workers	Once construction ends, the approximately 10 000 workers employed on the Project will leave the area. This will harm local communities that may have become economically dependent on these workers. Local businesses, accommodation providers, and service industries are likely to experience reduced income as spending in the local economy declines. In addition, social relationships formed during construction will be disrupted. Some workers may have formed long-term relationships with residents, including starting families. As workers move away to seek employment elsewhere, there is a risk that these relationships will end, potentially leaving social and emotional impacts on affected households, including the possibility of absent parents.	C	High (B, T)	- Implement a phased and well-communicated demobilisation plan to avoid sudden workforce withdrawal and allow communities and local businesses time to adjust. - Provide transferable skills training and certification during construction to improve workers' employability on other projects or in alternative sectors after construction. - Support local economic transition, including linking local suppliers and service providers to the operational phase or alternative markets. - Use managed worker accommodation with a clear exit and rehabilitation strategy to prevent informal settlement formation and secondary social impacts after construction.	Moderate (B, T)
Traffic	The construction phase will see a significant rise in traffic due to the movement of construction workers and the delivery of materials and equipment. This will lead to higher traffic volumes on provincial roads near the site. The increased traffic is expected to reduce the level of service on affected roads, potentially causing congestion, delays, and temporary disruptions to local traffic and tourism movements. There will be an elevated	C	High (B, T)	- A dedicated Construction Traffic Management Plan to address these impacts, including haul routes, timing restrictions, safety measures, and ongoing monitoring, must be developed. - Early engagement with road authorities and upgrades to site access roads are also advised.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	risk to road safety, particularly for pedestrians and non-motorised users, due to the higher volume and mix of heavy vehicles and regular traffic. This is especially relevant in nearby settlements and along key provincial routes. The transport of oversized and heavy construction components will require careful route planning, assessment of geometric and structural constraints, and, if necessary, temporary works or modifications to accommodate these loads. Escorts and permits will be necessary. Construction activities may temporarily disrupt normal traffic patterns, especially during peak construction periods or when abnormal loads are being transported. The impact of construction traffic may be compounded during seasonal tourism peaks or when other developments are underway in the region (Innovative Transport Solutions, 2025). The traffic report recommends developing a dedicated Construction Traffic Management Plan to address these impacts, including haul routes, timing restrictions, safety measures, and ongoing monitoring. Early engagement with road authorities and upgrades to site access roads are also advised. Formalising and enhancing pedestrian walkways and public transport pick up and drop off points and coordinating closely with road authorities and emergency planners. Early identification and protection of abnormal load corridors, strict adherence to access standards, and targeted stakeholder engagement are also advised to ensure safe, efficient, and minimally disruptive			- Formalising and enhancing pedestrian walkways and public transport pick up and drop off points and coordinating closely with road authorities and emergency planners. - Early identification and protection of abnormal load corridors, strict adherence to access standards, and targeted stakeholder engagement.	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	road construction activities (Innovative Transport Solutions, 2025).				
	During the operational phase, traffic impacts are expected to be significantly lower than during construction. The main sources of traffic will be daily staff commutes, occasional deliveries (including nuclear fuel, delivered 2–3 times per year), transport of LLW and ILW to Vaalputs, visitors, maintenance and diesel/gas deliveries. HLW will be stored on-site. The infrequent nature of nuclear fuel deliveries means their impact on the road network will be negligible. Routine operational traffic is not expected to exceed the capacity of the existing road network, given the low growth rate in background traffic and the robust capacity of key intersections.	O	High (B, T)	■ New site access roads should be designed, including appropriate turning lanes and access control to ensure safety and operational efficiency. ■ Maintain and monitor access roads and intersections to ensure continued safe and efficient operation. ■ Implement parking and on-site circulation planning to avoid congestion at the facility. ■ Integrate public transport options and improve pedestrian walkways and crossings where demand exists. ■ Continue targeted maintenance and upgrades for provincial link roads, especially those identified as being in poor condition during the construction phase. ■ Review and upgrade public transport stopping areas and pedestrian facilities within nearby settlements to improve safety and accessibility. ■	Moderate (B, T)
Cultural Heritage Impact	Bantamsklip The site is embedded in a wilderness landscape, with very high and high sensitivity, adjacent to Agulhas National Park and several nature reserves. The open coastal plain allows for wide vistas and long visual distances, with little topography or vegetation to shield new	C	High (B, T)	Bantamsklip ■ Establish strict exclusion zones over: The coastal band (up to 300–500 m from shoreline). All areas containing shell middens, fish traps, artefacts, and shipwrecks.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	development. Key features include Carruthers Hill, Scarpe, and the historic scenic R43/R317 route, all of which have local heritage significance. The landscape's integrity is such that large-scale infrastructure (like a nuclear power station and associated overhead power lines) would have a major, negative, and largely irreversible impact (Wiltshire N, 2025). The coastal band (up to 300–500m from the shoreline) contains numerous, well-preserved Later Stone Age shell middens, fish traps, and shipwrecks. Inland, archaeological sensitivity drops sharply beyond 300m from the coast. The area has been occupied since the Stone Age, with evidence of hunter-gatherers, pastoralists, and colonial farming. The shell middens are considered highly significant archives of pre-colonial life and are protected by heritage legislation (Wiltshire N, 2025). The Bantamsklip coastal zone is of high local archaeological significance due to its dense, well-preserved sequence of Middle and Later Stone Age shell middens, artefacts and associated cultural landscape features spanning at least 80 000 years of human occupation (Wiltshire N, 2025). Thyspunt Thyspunt is provisionally protected as a Grade I Cultural Landscape (of national significance), with protection lapsing in February 2027 (renewable). The site is surrounded by nature reserves and protected areas and features sensitive dune fields with significant archaeological value. The landscape is natural,			Conserve all Later Stone Age and Middle Stone Age shell middens as protected heritage resources. Protect the wilderness character and visual integrity of the landscape by avoiding large-scale infrastructure. Prevent development that would affect long-distance views, scenic routes (R43/R317), and heritage landmarks (e.g. Carruthers Hill). Manage public access to sensitive heritage areas, following controls similar to those implemented at Koeberg. Implement Chance Finds Protocols for any permitted ground disturbing activities (e.g. conservation management works). Maintain the site as part of the broader protected area network adjacent to Agulhas National Park and surrounding nature reserves. Thyspunt ■ Maintain provisional Grade I Cultural Landscape protection, with renewal beyond February 2027. ■ Establish a Grade IIIA no development coastal buffer: ■ Approx. 10 km × 500 m along the shoreline. ■ Establish a Grade IIIB no development buffer over the open dune system: ■ Approx. 18 km × 1.2 km inland. ■ Implement strict exclusion zones over: - Dense shell middens. - Fish traps and shipwreck locations.	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	with very high archaeological and palaeontological significance, and is considered unsuitable for nuclear development from a cultural landscape perspective. The dune fields provide some visual shielding, but their archaeological significance outweighs this benefit (Wiltshire N, 2025). The site's status as a Grade I landscape is under review, and further engagement with SAHRA is needed to clarify boundaries and motivations for the nomination. The coastal band (up to 500 m from the shoreline) and open dunes (up to 1.2 km inland) contain dense shell middens, fish traps, and shipwrecks. The area has been occupied since the Early Stone Age, with evidence of hunter-gatherers, pastoralists, and colonial farming (Wiltshire N, 2025). The shell middens are among the best preserved in South Africa and are considered highly significant. A Grade IIIA no-development buffer is recommended along the coast (10 km x 500 m), and a Grade IIIB buffer over the open dune system (18 km x 1.2 km) (Wiltshire N, 2025). The Thyspunt cultural landscape is of Grade 3 (local) heritage significance, with the coastal strip rated Grade IIIA (high local significance) and the open dune system rated Grade IIIB (moderate local significance).			Archaeologically sensitive dune fields. - Avoid all highly sensitive areas, prioritising preservation of: Landscape integrity. Connectivity between heritage features. The setting and context of archaeological sites. - Conserve and protect exceptionally well-preserved shell middens, recognised as nationally significant. - Apply controlled public access management, aligned with Koeberg's best practice. - Implement and enforce Chance Finds Protocols during all construction and pre-construction activities. - Undertake expanded heritage and archaeological studies before any development decisions. - Engage continuously with SAHRA to: Confirm final heritage grading. Clarify site boundaries. Ensure regulatory compliance. - Consider site museums or conservation/interpretation centres to preserve and communicate cultural heritage values, as at Koeberg.	
Health	The health assessment report highlights PM _{2.5} as the primary health concern in Bantamsklip and Thyspunt, with children and older adults	C	Moderate (B, T)	Access to the construction site will be tightly controlled to minimise exposure	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	most vulnerable. The construction of the NPP will increase PM _{2.5} (fine particulate matter) in the air, which is linked to cardiovascular, respiratory diseases, and lung cancer, especially in nearby communities. Baseline health data indicate moderate cardiovascular vulnerability and low respiratory vulnerability in the general population. Sensitive receptors include hospitals, schools, daycare facilities, and elderly housing, but in rural areas, all residents are considered potentially sensitive (van Niekerk, 2025).			- and disturbance to surrounding communities. - Secure construction sites and manage labour camps to minimise exposure. - Use of water sprays, covering of stockpiles, and minimising vehicle movement on unpaved surfaces to reduce dust emissions. - Continuous measurement and modelling of PM_{2.5} levels to identify and protect sensitive groups. - Use international standards (WHO, USEPA) to quantify risks and adapt mitigation as new data emerges. - Special attention to children and older adults in planning and interventions.	
Tourism	With the NPP located on the coast, tourists interested in visiting the coast may be discouraged from doing so due to concerns about nuclear energy.	O	Moderate (B, T)	- Provide relevant and accurate information to tourists through tourist information centres and tourism-affiliated businesses. - Promote local procurement from tourism businesses during project operations (accommodation, conferencing, catering). - Implement an ongoing tourism-focused communication programme that clearly explains operational safety, environmental monitoring, and emergency preparedness in plain language. - Engage in the enhancement of coastal and marine management measures to keep the coast pristine.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				- Provide support to local tourism businesses to ensure that they can provide good service delivery to the tourism industry. - Operational safety and environmental compliance should be embedded into the core principles of the project to ensure that it is part of the institutional culture.	
	The NPP could also have a positive impact on tourism, such as the improved infrastructure provided by the project, which will improve access to the coast. There could be an increase in tourism among people interested in NPP. Specialised tours could be allowed for those interested in seeing the NPP during the operational phase, this could boost the tourism industry. There are proposals to turn the site into a nature reserve as what has been done at Koeberg. This could attract tourists to the area.	O	Moderate + (B, T)	- Provide relevant and accurate information to tourists through tourist information centres and tourism-affiliated businesses. - Promote local procurement from tourism businesses during project operations (accommodation, conferencing, catering). - Engage in the enhancement of coastal and marine management measures to keep the coast pristine. - Provide support to local tourism businesses to ensure that they can provide good service delivery to the tourism industry.	Moderate + (B, T)
Provision of electricity	The NPP will generate electricity that will be added to South Africa's national power grid, increasing the country's energy capacity. This will lessen the likelihood of loadshedding. Not having loadshedding will, in turn, support the country's economy. The added electricity supply to the country will support development and national economic stability. The impact is	O	High + (B, T)	Apply strict operational safety, reliability, compliance and maintenance programmes. These measures will ensure that the energy supply to the national grid is not interrupted.	Very High + (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	rated as high positive and very high positive post-enhancement measures.				
Radiological impact on the public	The radiological assessment for the proposed NPP at Thyspunt and Bantamsklip concludes that radiation exposure to the public during normal operations would remain well within regulatory safety limits. Conservative modelling shows that annual radiation doses from airborne releases, liquid discharges, and external exposure are all far below the national public dose limit of 1 millisievert per year (mSv)/year.²⁰⁵, as well as the stricter site-specific constraint of 0.25 mSv/year. The highest calculated public exposure is for adults, with estimated total doses of 0.171 mSv/year at Thyspunt and 0.129 mSv/year at Bantamsklip. These values are considered low and pose no measurable health risk. Short-term operational events, such as maintenance or refuelling, may cause brief increases in	O	Low (B, T)	- Design and operate the NPP to keep public radiation exposure well below 1 mSv/year and the 0.25 mSv/year site constraint. - Apply conservative radiological modelling for routine and abnormal operating conditions. - Maintain robust containment and engineering barriers to prevent unplanned radioactive releases. - Minimise groundwater contamination risk through coastal siting and engineered safeguards. - Implement continuous environmental monitoring of air, water, soil, food pathways, and biota. - Control maintenance and refuelling activities to ensure short-term releases remain within limits.	Low (B, T)

²⁰⁵ mSv/year stands for millisieverts per year.

- A sievert (Sv) is a unit used to measure the health effect of radiation on the human body.
- A millisievert (mSv) is one thousandth of a sievert.
- mSv/year therefore describes how much radiation a person is exposed to over the course of one year.

For context:

- Average natural background radiation worldwide is about 2–3 mSv/year.
- The regulatory limit for public exposure from nuclear facilities in South Africa is 1 mSv/year, excluding natural background radiation.
- The doses predicted for this project are well below both natural background levels and regulatory limits.

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	releases, but these are also predicted to remain safely within acceptable limits. Environmental assessments indicate that existing levels of natural and artificial radioactivity in air, water, soil, and living organisms are low, and no significant increase is expected from plant operations. The risk of groundwater contamination is assessed as negligible due to the coastal setting, robust engineering barriers, and continuous monitoring. Assessments of non-human biota similarly show no exceedance of international screening thresholds, indicating no ecological harm. Overall, both sites are rated as having low radiological significance under normal operating conditions. From a radiological perspective, neither Thyspunt nor Bantamsklip is preferred over the other, as both meet safety requirements using conservative assumptions. Emergency preparedness measures will also be in place to manage unlikely accident scenarios and to prevent significant off-site impacts. Emergency preparedness and response for the proposed NPP is governed by strict regulatory requirements set by the NNR and the DFFE. Emergency response planning is a mandatory component of the SSR and the ESIA, ensuring that credible accident scenarios are anticipated and managed in line with national legislation and international good practice.			- Develop and implement an NNR-compliant Emergency Preparedness and Response Plan. - Maintain trained emergency response teams and clear incident escalation procedures. - Restrict access and use shielding and containment to limit exposure during incidents. - Apply public protection measures (e.g. shelter in place or evacuation) only if thresholds are approached. - Ensure timely reporting, regulator coordination, and public communication during incidents. - Review emergency plans regularly and update based on drills and lessons learned.	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	Potential emergency scenarios range from minor operational incidents, such as maintenance-related releases, to abnormal or accidental releases of radioactive material via air or water. Direct external radiation exposure from plant structures is also considered, while groundwater contamination is assessed as highly unlikely due to the coastal location and engineered safety barriers. All scenarios are evaluated conservatively to ensure protection of workers, the public, and the environment. In the event of an incident, immediate response actions include activating trained emergency teams, containing and controlling radioactive materials, and real-time monitoring of air, water, soil, and food pathways. Access to affected areas is restricted, and engineered shielding and containment systems are used to minimise exposure. Public protection measures, such as evacuation or shelter-in-place, would be implemented only if dose thresholds were at risk of being exceeded, alongside medical assessment where required and transparent communication with surrounding communities. Emergency preparedness is supported by continuous environmental monitoring, routine review of emergency plans, and regular training and drills. All incidents must be promptly reported to relevant authorities, with a coordinated response between regulators and the operator. Where necessary, remediation and long-term environmental recovery measures would be implemented. Lessons learned from exercises and incidents are				

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	systematically incorporated to ensure continuous improvement of emergency response capability.				
Financial viability of the NPP	Financial feasibility of the project Given the expected benefits and costs associated with the construction, operation, and decommissioning phases of the project, it is assumed that the project will generate sufficient returns on investment during its operational phase. It is important to note that the financial assessment of the project is conducted for the entire lifespan of the project. Therefore, all the phases (planning, construction, operation and decommissioning) are included in the analysis.	O	Very High + (B, T)	The maximisation of the financial success of the project depends on factors such as financial structure and cost of capital, construction risk management, project governance and procurement efficiency, and long-term tariff and regulatory stability.	Very High + (B, T)
Job losses	Jobs created during the construction and operational phases will be lost during this phase, regardless of whether they were for skilled or unskilled workers. Tasks or jobs previously required (such as operating and maintaining the nuclear reactor equipment) will be completed. Loss of employment will lead to a reduction and disruption in the standard of living for those affected.	D	High (B, T)	- Implement a phased and well-communicated demobilisation plan to avoid sudden workforce withdrawal and allow communities and local businesses time to adjust. - The Unemployment Insurance Fund can benefit workers whose employment may be lost during the decommissioning phase transition. - Provide transferable skills training and certification during operation to improve workers' employability on other projects or in alternative sectors after decommissioning. - Support local economic transition to alternative markets.	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
				Use managed worker accommodation with a clear exit and rehabilitation strategy to prevent informal settlement formation and secondary social impacts after decommissioning.	
Reduction in electricity	The decommissioning of the NPP after more than four decades of operation could lead to a reduction in the amount of energy supplied to the national grid.	D	Very High (B, T)	The only mitigation is that an alternative power source for the grid is found.	Low (B, T)
Infrastructure	With the decommissioning of the NPP, there will be impacts on local infrastructure such as roads, which will have been maintained for the project. Accommodation used for the project and social infrastructure, such as medical facilities, schools, and the like. The infrastructure could fall into disrepair once the NPP is closed.	D	High (B, T)	- The municipality should be extensively consulted on what should happen to the infrastructure that will need to be maintained post the project. - A plan should be developed in consultation with the municipality regarding infrastructure management.	High (B, T)

10.4.16 HERITAGE

The following preliminary impacts have been identified for the Heritage aspect. The detailed report is included in **Appendix G.16**.



Table 10-18 outlines the summary of the impacts identified and their significance.

Table 10-18 – Heritage Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Impacts to the Cultural Landscape	Bantamsklip This study assesses the significance and sensitivity of the cultural landscape potentially impacted on by the proposed nuclear power station and associated infrastructure at Bantamsklip. The study identifies that the entire project site is located in areas of very high and high sensitivity in an overwhelmingly wilderness natural landscape with fine grained human elements, which would be unable to be supported from a cultural landscape perspective. The concern relates specifically to the Agulhas National Park and surrounding Nature Reserves and Protected Areas which abut the proposed site. Further also the very high sensitive topographical features such as the scarpe and Carruthers Hill which dominate the coastal plain as well as the historic scenic local road, the R43/ R317, which has been identified as a scenic route with local heritage significance. The open coastal plain character of the landscape allows for wide vistas and long visual distances and views with very little topography, built form or vegetation for visual shielding of the proposed development. The impact of infrastructure related to a nuclear power station development must also be taken into account. The overhead power lines that will connect the station to the nearest grid connection will need to traverse the very highly sensitive and no-go topographical features, such as the scarpe and ridgelines,	C, O, D	Very High (B)	■ The proposed OHL routes to align with existing linear infrastructure such as main roads. ■ Careful design of the facility to minimise the visual interruption along the coastal corridor. ■ Placement of the facility within the recommended area to minimise impact on the highly sensitive archaeological shell middens.	High (B)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	which is unsupportable from a cultural landscape perspective.				
	Thyspunt This study assesses the significance and sensitivity of the cultural landscape potentially impacted on by the proposed nuclear power station and associated infrastructure at Thyspunt. The study identifies that the entire project site is located in areas of very high and high sensitivity in a natural landscape with very high archaeological and palaeontological significance which has been provisionally protected as a Grade I Cultural Landscape and would be unable to be supported from a cultural landscape perspective. The concern relates specifically to the provisionally protected Grade I heritage site within which the project site is located and surrounding Nature Reserves and Protected Areas which abut the proposed site. Further also the very high sensitive topographical features such as the dune field which dominate the coastal plain and have very high archaeological significance. The dune fields do offer some shielding from the visual impact of a large-scale development on surrounding visual receptors but their archaeological significance outweigh any benefit this might offer. Slopes of 10% up to > 30% are present on the site and would be no-go for large scale development from cultural landscape perspective. Sensitive cultural coastline features such as the historic fish traps and rocky shores and sandy beaches are testament to the long ongoing	C, O, D	High (T)	■ The proposed OHL routes to avoid the sensitive dune field, route possibly via Oyster Bay. ■ Careful design of the facility to minimise the visual interruption along the coastal dune band. ■ Placement of the facility within the recommended area to minimise impact on the highly sensitive archaeological shell middens and open dune fields.	Moderate (T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	relationship between man and environment in this area and are of at least high local and provincial heritage significance. The impact of infrastructure related to a nuclear power station development must also be taken into account. The overhead power lines that will connect the station to the nearest grid connection will need to traverse the very highly sensitive and no-go dune field features. The intake and outlet pipes will have a high negative impact on the significant historic coastline as well as the temperature of the surrounding ocean where the globally significant and temperature-sensitive stromatolite features have been identified. The nearby coastal towns, agricultural landscape and recent addition of the wind energy developments do reduce the wilderness sense of place of the landscape somewhat; however the intentional conservation of the remaining natural and cultural features indicate a recognition and appreciation for these elements in the landscape and the undulating dune landscape provides some visual shielding from the surrounding development.				
Impacts to Archaeological and Heritage Resources	Bantamsklip As described extensively by Hart (2012), the area around Bantamsklip has not been studied extensively in terms of research projects at undergraduate and postgraduate level. However, their surveys conducted more than 13 years ago revealed over 50 observations of Later and Middle Stone Age material spread	C	Very High (B, T)	Bantamsklip A no development sensitivity zone, graded IIIA is delineated along the coastline spanning about 5km long by 300m wide. Developments taking place inside this zone such as the proposed water extraction pipeline, should be built to avoid excavations into the shell	Very Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	out across the immediate coastal strip up to 300m from the beach. The density of archaeological material drops off quickly as one moves further away from the rocky shoreline where marine foods were harvested by hunter-gatherers. Little to no evidence of widespread archaeological material was found in the middle zone between 500 m to 1 000 m from the coastline. The field visit in 2026 sought to assess whether any significant development or environmental changes had occurred since 2012. The study site was found to be largely in the same state as that described by Hart in 2012. The field assessment identified 9 observations inside the proposed development area that had already been documented by Hart which included some of the well-preserved shell middens, the Hagelkraal werf and preliminary observations of the cultural landscape setting using a drone to capture video and photographic footage. The gradings proposed by Hart in 2012 mostly assign Grade IIIB ratings to the shell middens with a few lower gradings assigned to more ephemeral scatters of shell (Grade IIIC). We largely concur with these findings and would propose that, as a collective series of well-preserved coastal sites, that an appropriate grading for the sensitivity zone is set at Grade IIIA, high local significance. This area runs from the western boundary of the property at Bantamsklip point and ends on the southeastern end at Shell Point, measuring			middens. If elevated construction above the middens is not possible, then mitigation of impacted sites must take by a qualified archaeologist. The bulk of the material must remain in situ unless excavated to a research project standard. ■ A site museum and conservation centre is setup using existing infrastructure available to provide public access to interpretative material describing the significance of the sites. ■ Public access to the shell middens should be made possible by declaring the remaining part of the property as a conservation area in a similar way to the Koeberg site. Monitored access to the shell middens is advised and walking trails should be carefully designed to avoid further damage to the middens. ■ Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	about 300 m wide from the coastline and around 5 km in length. Thyspunt As described extensively by Hart (2012), the dense vegetation across the inland dune cordon significantly hampers archaeological surveys and a widespread sampling excavation programme was undertaken to explore whether obscured and hidden archaeological material persisted into this zone. No evidence of widespread archaeological material was found in the middle zone between 500 m to 1 000 m from the coastline and the archaeological sites are noted again once one moves into the open dune fields about 1.2 km from the coastline. The field visit in 2026 sought to assess whether any significant development or environmental changes had occurred since 2012. The study site was found to be largely in the same state as that described by Hart in 2012. The largest change that has taken place lies on the boundary of the study area to the north where a large number of already built wind farms now cover the landscape. The field assessment identified 10 observations inside the proposed development area that had already been documented by Hart which included some of the well-preserved shell middens, some non-conservation worthy buildings and preliminary observations of the cultural landscape setting using a drone to capture video and photographic footage.			vicinity of the find and HWC must be alerted immediately to determine an appropriate way forward. Thyspunt - A no development sensitivity zone, graded IIIA is delineated along the coastline spanning about 10km long by 500m wide. Developments taking place inside this zone such as the proposed water extraction pipeline, should be built to avoid excavations into the shell middens. If elevated construction above the middens is not possible, then mitigation of impacted sites must take by a qualified archaeologist. The bulk of the material must remain in situ unless excavated to a research project standard. - A grade IIIB sensitivity zone is delineated over the open dune system which also holds a number of open-air archaeological sites. This area measures around 18km long by 1.2km wide. Only appropriate development in this area can take place with more room for full mitigation of affected archaeological sites. - A site museum and conservation centre is setup using existing infrastructure available to provide public access to interpretative material describing the significance of the sites. - Public access to the shell middens should be made possible by declaring the remaining part of the property as a	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	The gradings proposed by Hart in 2012 mostly assign Grade IIIB ratings to the shell middens with a few lower gradings assigned to more ephemeral scatters of shell (Grade IIIC). We largely concur with these findings and would propose that, as a collective series of well-preserved coastal sites, that an appropriate grading for the sensitivity zone is set at Grade IIIA, high local significance. This area runs from the western boundary of the property near Oyster Bay and ends on the eastern end of Thysbaai, measuring about 500 m wide from the coastline and around 10 km in length. The open dune fields are also sensitive, and a Grade IIIB rating running a length of about 18km and roughly 1.2 km wide is recommended – this will sufficiently manage future impacts in this area with appropriate attention being paid to proposed developments.			conservation area in a similar way to the Koeberg site. Monitored access to the shell middens is advised and walking trails should be carefully designed to avoid further damage to the middens. Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and the relevant heritage authority (currently SAHRA but usually the ECPHRA) must be alerted immediately to determine an appropriate way forward.	
Impacts to Palaeontological Heritage Resources	Bantamsklip The proposed development at Bantamsklip will involve construction-related activities including vegetation clearance, surface stripping, levelling, and localised excavations for associated infrastructure within the defined development footprint. These activities will result in disturbance of surface and shallow	C	Very High (B, T)	- Palaeontological monitoring of excavations for the main NPP footprint - A Chance Fossil Finds Protocol (CFFP) must be implemented as part of the EMP, requiring work to cease in the vicinity of any fossil discovery and assessment by a qualified palaeontologist.	Very Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	sub-surface sediments and therefore have the potential to impact palaeontological resources where fossil-bearing geological units are present. The development area is predominantly underlain by Quaternary coastal sediments of the Bredasdorp Group, comprising the Strandveld Formation (Holocene unconsolidated aeolian sands) and the Waenhuiskrans Formation (Late Pleistocene semi-consolidated aeolian sands with calcrete development). These deposits mantle Early to Late Ordovician quartzitic bedrock of the Peninsula Formation (Table Mountain Group), which is locally exposed along the rocky coastline and occurs at shallow depth beneath the coastal sediment cover. Regionally, the Waenhuiskrans and Strandveld formations are recognised as potentially fossiliferous units, capable of preserving terrestrial gastropods, rare vertebrate remains, ostrich eggshell fragments, trace fossils, palaeosols, and locally significant vertebrate trackways in consolidated aeolianites. However, the site-specific palaeontological potential within the development footprint is considerably reduced. Field assessment results indicate that the coastal sediments are extensively vegetated, calcretised, and reworked, with limited natural exposure of intact stratigraphic horizons. Only a single occurrence of sparse, fragmentary invertebrate shelly material preserved within calcrete of the Waenhuiskrans Formation was recorded during the field survey, and no vertebrate			Minimise disturbance: Where feasible, utilise existing roads and previously disturbed areas to limit new ground disturbance.	

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	fossils, trackways, or diagnostically significant assemblages were identified. The underlying Peninsula Formation quartzites are lithologically resistant, highly deformed, and unfossiliferous, with regional fossil occurrences limited to sparse and low-diversity trace fossils. No fossil material was observed within bedrock exposures during the field assessment, and the likelihood of encountering palaeontologically significant material within this unit during construction is considered low. Most proposed ground-disturbing activities are expected to be shallow and localised, largely confined to unconsolidated surface sands and calcretised horizons of the Bredasdorp Group. These activities are unlikely to intersect deeper, potentially fossil-bearing horizons or intact palaeosurfaces of high scientific significance. It is recognised that extensive excavations exceeding approximately 5 m in depth would take place in the immediate area for the nuclear power station and may intersect or expose potentially fossiliferous horizons, including locally concentrated fossil accumulations at depth. In a broader stratigraphic context, this would elevate the palaeontological sensitivity of the deeper subsurface to moderate or high. Under such circumstances, the likelihood of encountering in situ fossil-bearing units would be greater than during shallow construction activities. Based on the geological context, results of the field assessment, the verified low palaeontological sensitivity of the geological units present, and the nature and scale of the				

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	proposed development, the overall impact of the development on palaeontological heritage resources is assessed as low. No direct negative impacts on known or significant palaeontological resources are anticipated. Nevertheless, as with all developments within coastal Quaternary sedimentary environments, a low residual risk of chance fossil discoveries remains, particularly within calcretised aeolian sands or buried palaeosol horizons. This risk can be effectively managed through the implementation of a standard Chance Fossil Finds Procedure during construction. Thyspunt The proposed development at Thyspunt will involve construction-related activities that include vegetation clearance, surface stripping, levelling, localised excavations, and the establishment of associated infrastructure within the defined development footprint. These activities will disturb surface and shallow sub-surface sediments and, as such, have the potential to impact palaeontological resources where fossil-bearing geological units are present. The development area is predominantly underlain by Neogene to Quaternary coastal sediments of the Algoa Group, principally the Nanaga Formation and unconsolidated aeolian sands of the Schelm Hoek Formation, which mantle Silurian-aged quartzitic bedrock of the Nardouw Subgroup (Table Mountain Group). Borehole data indicate the presence of				

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	additional Algoa Group units at depth, including the Alexandria, Salnova and Nahoon formations, although these units are not exposed at surface within the current development footprint. Regionally, several of the Algoa Group formations are recognised as fossiliferous, particularly the Alexandria, Salnova, Nahoon and Schelm Hoek formations, which may preserve marine and terrestrial invertebrates, trace fossils, vertebrate remains, palaeosols and associated archaeological material. However, the site-specific potential for significant palaeontological resources within the development footprint is considerably reduced. Much of the development area is characterised by dense dune vegetation, soil development, calcretisation and reworked aeolian deposits, which significantly limit the exposure of potentially fossil-bearing strata. Where quartzitic bedrock is exposed along the rocky coastline, it comprises lithologies known to preserve only sparse trace fossils regionally and is of low palaeontological sensitivity. Similarly, although the Schelm Hoek Formation is regarded as having very high palaeontological sensitivity in a regional context, the unconsolidated nature of the dune sands, extensive vegetation cover, and absence of observable fossil material within the footprint indicate a low likelihood of encountering scientifically significant				

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	palaeontological resources during construction. The depth and extent of most proposed excavations are expected to be shallow and localised, further reducing the probability of intersecting fossil-bearing horizons associated with deeper Algoa Group formations or the Nardouw Group deposits. It is recognised that extensive excavations exceeding approximately 5 m in depth would take place in the immediate area for the nuclear power station and may intersect or expose potentially fossiliferous horizons, including locally concentrated fossil accumulations at depth. In a broader stratigraphic context, this would elevate the palaeontological sensitivity of the deeper subsurface to moderate or high. Under such circumstances, the likelihood of encountering in situ fossil-bearing units would be greater than during shallow construction activities. Based on the geological context, field assessment results, absence of recorded fossil material, and the nature of the proposed construction activities, the overall impact of the proposed development on palaeontological heritage resources is assessed as low-moderate. No direct negative impacts on known palaeontological resources are anticipated. However, as with all developments in coastal Quaternary settings, there remains a low residual risk of chance fossil discoveries during ground-disturbing activities, particularly within unconsolidated aeolian sands or calcretised horizons. This risk can be adequately managed through the				

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	implementation of a standard Chance Fossil Finds Procedure during construction.				

10.4.17 NOISE

The following preliminary impacts have been identified for the Noise (Acoustic) aspect. The detailed report is included in **Appendix G.18**. Table 10-19 outlines the summary of the impacts identified and their significance.

Table 10-19 – Noise Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Noise impact on surrounding sensitive receptors	The noise impact is determined by the number of receptors located close to the site that will be impacted on directly by the project.	C, O, D	Moderate (B)	■ Installing acoustic enclosures for equipment causing radiating noise. ■ Improving the acoustic performance of constructed buildings by applying sound insulation. ■ Establishing noise deflection walls. ■ Ensuring equipment with the lowest sound power level specifications are selected for the project. ■ Ensuring equipment is properly maintained and installing suitable mufflers/silencers on engine exhausts, where practical. ■ Equipment must be suitably sized for the proposed task. ■ Locating noise sources in less sensitive areas to take advantage of distance and shielding.	Low (B)
			Moderate (T)		Moderate (T)

10.4.18 TOWN PLANNING

The following preliminary impacts have been identified for the Town Planning aspect. The detailed report is included in **Appendix G.24**. Table 10-20 outlines the summary of the impacts identified and their significance.

Table 10-20 – Town Planning Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Urban (residential or otherwise) expansion	Bantamsklip No urban (residential or otherwise) expansion closer to the proposed site is envisaged in the district and municipal spatial development frameworks. The site is, however, not yet included as a potential site for nuclear power generation and associated infrastructure and ancillary uses.	C, O	Low (B)	In terms of forward planning, it is adherence with the (draft) OEMZ and the context of the Protect Areas and CBAs that the inclusion of a new nuclear site is to be assessed. The land use environment is conducive to a proposed nuclear power station, as national- and district-scale energy generation and associated infrastructure is placed outside of settlement boundaries as a norm.	Very Low (B)
	Thyspunt The urban edge around Oyster Bay does not create expansion towards Thyspunt beyond the eastern edge of the town, and neither is there planned westward expansion of the St Francis cluster. In addition, the spatial development frameworks have already set the land use exclusions and management parameters for any land uses (agricultural or otherwise) within 16km proximity to the proposed site.	C, O	Moderate (T)	The land use exclusions and management parameters for any land uses (agricultural or otherwise) within 16km proximity to the proposed site must be adhered to.	Very Low (T)

10.4.19 VISUAL

The following preliminary impacts have been identified for the Visual aspect. The detailed report is included in **Appendix G.15**. Table 10-21 outlines the summary of the impacts identified and their significance.

Table 10-21 – Visual Impact Significance (P – Planning, C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Change of the landscape characteristics and key views (visual intrusion) and change to the sense of place	A change in landscape characteristics and key views often results in visual intrusion, where new structures or alterations disrupt established sightlines, scenic vistas, or the natural harmony of the environment. This can diminish the sense of place, as communities may feel a loss of identity, cultural connection, or emotional attachment to familiar surroundings, leading to reduced aesthetic value and altered perceptions of the area's character.	P	Low (B, T)	- Restrict access to sensitive areas by vehicles and machinery. - Select routes to each location based on sensitive areas. - Do not allow deviation from access road or random driving through natural areas. - Draft specific specifications for each action and provide a “conduct” list to persons working on site during the design phase. - Prepare mitigation design details and specifications for all actions e.g. colour and form, slope stabilisation and vegetation to blend new cut and fill landforms into the setting. - Include screen berms in tender documentation for pricing by contractor. - Appoint a specialist such as a landscape architect to advise on the design of earth shaping and site rehabilitation.	Low (B, T)
	Construction activities include the removal of vegetation, earthworks required to create building terraces for internal substations and	C	Moderate (B, T)	Limit area of disturbance for access roads, and construction camp sites.	Moderate (B, T)

	preparation of the internal roads as well as excavations for the plant structures' foundations and associated infrastructure and the clearing of vegetation for access roads. Construction activities would potentially negatively affect the landscape's visual quality and sense of place relative to its baseline. They would contrast with the patterns that define the structure of the landscape.			■ Locate construction camps and all related facilities such as stockpiles, lay-down areas, batching plants in areas already impacted such as existing farmyards or in unobtrusive locations away from the main visual receptors. ■ Limit access tracks for construction and maintenance vehicles to existing roads where possible. Once established do not allow random access through the veld. ■ Suppress dust during construction. ■ Blend edges of road and platforms with surrounding landscape. ■ Rehabilitate exposed disturbed areas ■ Avoid vegetation stripping in straight lines but rather non-geometric shapes that blend with the landscape. ■ Limit need for security lighting. ■ Use non-reflective materials. ■ Paint all other project infrastructure elements such as operational buildings, support poles etc. a dark colour. ■ Avoid bright colour/patterns and logos.	
	Operational activities include the regular maintenance of the plant and associated infrastructure, vegetation management u and around the structures and maintenance of all other infrastructural components. Security lighting, aviation hazard flashing lights, and other lighting associated with the movement of security vehicles at night. These activities along with the physical presence of the Project components day and night, constitute the visual impact.	O	High (B, T)	■ Limit need for security lighting. ■ Use non-reflective materials. ■ Paint all other project infrastructure elements such as operational buildings, support poles etc. a dark colour. ■ Avoid bright colour/patterns and logos. ■ Maintain rehabilitated disturbed areas.	High (B, T)

	Decommissioning and closure activities include the dismantling and removal of infrastructure and the rehabilitation of the site back to its current, mostly natural, state.	D	Very Low (B, T)	- Remove all project components from site. - Rip all compacted hard surfaces such as platforms, works areas, access and service roads etc. and reshape to blend with the surrounding landscape. - Rehabilitate/revegetate all disturbed areas to visually the original state by shaping and planting.	Very Low (B, T)
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10.4.20 HEALTH RISK

The following preliminary impacts have been identified for the Health Risk aspect. The detailed report is included in **Appendix G.19**. Table 10-22 outlines the summary of the impacts identified and their significance.

Table 10-22 – Health Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Short-term PM _{2.5} exposure	Potential health effects include: - Respiratory effects Asthma exacerbation in asthmatic adults and children. Chronic obstructive pulmonary disease (COPD). Respiratory infections. - Cardiovascular effects Cardiac conditions. Stroke or thrombo-embolic disease. - Mortality All-cause: total from all natural causes (excludes accidents, self-harm or homicide).	O	Low (B, T)	Not assessed at Scoping stage.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	Mortality due to the above cardiovascular effects (strong evidence). Mortality due to the above respiratory effects (limited evidence).				
Long-term PM _{2.5} exposure	Potential health effects include: - Respiratory effects Decrements in lung function. Asthma incidence and prevalence increase in children. - Cardiovascular effects Cardiac heart disease or stroke in those with pre-existing disease. - Nervous system effects Reduced cognitive function and neurodegeneration in adults (consistent evidence). Neurodevelopmental effects in children (limited and inconsistent). - Reproductive effects Male and female reproduction and fertility. Pregnancy and birth outcomes. - Cancer Lung cancer. - Mortality Mortality, natural all-cause, all ages. Cardiovascular disease (consistent). Respiratory disease (generally consistent).	O	Low (B, T)	Not assessed at Scoping stage.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	COPD (modest and generally less precise).				

10.4.21 CLIMATE CHANGE

The following preliminary impacts have been identified for the Climate Change aspect. The detailed report is included in **Appendix G.23**. Table 10-23 outlines the summary of the impacts identified and their significance.

Table 10-23 – Climate Change Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Increasing temperatures and long-term heat exposure	Long-term increases in baseline ambient temperatures may affect equipment performance margins, cooling efficiency, and occupational heat exposure over the operational life of the proposed nuclear power plant and associated infrastructure.	O	Moderate (B, T)	Not assessed at Scoping stage.	Not assessed at Scoping stage
Water stress and drought affecting water availability	Increasing drought risk and extremely high baseline water stress may affect water availability for construction activities and long-term operational requirements.	C, O	High (B, T)	Not assessed at Scoping stage.	Not assessed at Scoping stage
Extreme rainfall and surface runoff	Intense rainfall events may result in localised flooding, erosion and temporary disruption during construction and operation. This excludes compound coastal flooding, which addressed separately under coastal processes.	C, O	Low (B, T)	Not assessed at Scoping stage.	Not assessed at Scoping stage

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Wildfire risk	Climate-driven changes in fire-conductive conditions may increase wildfire risk affecting access routes, auxiliary infrastructure, and emergency response capacity.	C, O	Low (B)	▪ Not assessed at Scoping stage.	Not assessed at Scoping stage
			Moderate (T)	▪ Not assessed at Scoping stage.	Not assessed at Scoping stage
Coastal processes	Sea-level rise and extreme coastal events may affect the integrity, safety, and operability of coastal and near-shore infrastructure over the project lifetime. Inclusive of HILP events.	O	High (B, T)	▪ Not assessed at Scoping stage.	Not assessed at Scoping stage
Climate-related disruption to interdependent infrastructure	Climate-related impacts on water supply, electricity transmission, transport access, and emergency response systems may result in cascading and compounding operational disruptions to the proposed nuclear power plant and associated infrastructure.	C, O	High (B, T)	▪ Not assessed at Scoping stage.	Not assessed at Scoping stage

10.4.22 RADIOLOGICAL IMPACTS

The following preliminary impacts have been identified for the Radiological aspect. The detailed report is included in **Appendix G.21**. Table 10-24 outlines the summary of the impacts identified and their significance.

Table 10-24 – Radiological Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Public exposure to radionuclides	The regulatory dose constraint for the public dose is met at both sites; i.e. the annual dose	O	Low (B, T)	▪ Monitor exposure levels at regular intervals.	Low (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	is less than 0.25 mSv/y for any member of the public.			- Monitor groundwater quality at regular intervals. - Leak detection monitors. - Emergency Preparedness Plans. - Emergency zone implementation.	
Non-human biota exposure to radionuclides	The regulatory dose constraint for the non-human biota dose is met at both sites; i.e. the annual dose is less than 10 µGy/h for all organisms.	O	Low (B, T)		Low (B, T)

10.4.23 RADIOACTIVE WASTE AND TRANSPORT

The following preliminary impacts have been identified for the Radioactive Waste and Transport aspect. The detailed report is included in **Appendix G.22**. Table 10-25 outlines the summary of the impacts identified and their significance.

Table 10-25 – Radioactive Waste and Transport Impact Significance (C – Construction, O – Operation, D – Decommissioning) (B – Bantamsklip, T – Thyspunt)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
Radioactive Waste and Transport	If waste generated at a NPP exceeds general clearance levels as defined in the IAEA General Safety Guide (GSG-18) (IAEA, 2023), it is considered radioactive by definition. The nature and quantities of radioactive waste, which may be in solid, liquid, or gaseous form, depend on the reactor type, specific design features, operating procedures and practices (including maintenance, refuelling, and operational incidents), the plant's operational history, and the integrity of the fuel. HLW will be stored on-site.	O, D	High (B, T)	- The National Radioactive Waste Disposal Institute Act (NRWDIA) (Act No. 53 of 2008), the Radioactive Waste Management Policy and Strategy (2005), the IAEA Safety Standards and the Safety Standards and Regulatory Practices (Regulation No. 388) must be adhered to. - The IAEA Specific Safety Guide (SSG-40) (IAEA, 2016) requires that measures be implemented to keep the generation of gaseous, liquid, and solid waste to a minimum practicable level,	Moderate (B, T)

Impact	Nature	Phase	Significance – Before mitigation	Provisional Mitigation Measures	Significance – after mitigation
	Transport of LLW and ILW will be disposed of at the Vaalputs Radioactive Waste Disposal Facility. Nuclear fuel is only anticipated to be delivered to the selected site delivered 2–3 times per year.			and that these measures be defined and implemented within the framework of a Radioactive Waste Management Programme (RWMP). Emergency evacuation routes and their performance must be considered, with the need to ensure that the network can handle evacuation scenarios efficiently.	

10.4.24 TRAFFIC

The traffic impact assessment can only be undertaken in the EIA phase, with potential impacts including site access and road geometry, construction traffic impacts, abnormal and heavy load transport, operational traffic, nuclear fuel and waste transport, emergency evacuation, public transport and pedestrian safety and road condition and maintenance. The Scoping Phase traffic reports are included in **Appendix G.20**.

10.5 CUMULATIVE IMPACT ASSESSMENT

Cumulative impacts refer to the successive, incremental, and/or combined effects of a project, activity, or action when considered alongside other existing, planned, or reasonably foreseeable developments. The assessment and management of cumulative impacts focus on those impacts that are scientifically significant or of concern to affected communities. While this assessment primarily addresses South African regulatory requirements, elements of internationally recognized standards, such as the IFC Performance Standards, provide valuable context for identifying and mitigating cumulative impacts. These standards will guide alignment during later stages of the project lifecycle.

Cumulative impacts are evaluated within the project's **area of influence**, which includes:

- Areas directly impacted by the project;
- Surrounding regions influenced by other existing and planned projects; and
- Broader geographic and temporal scales where unplanned but predictable impacts may emerge.

While compliance with IFC Performance Standards is not a requirement under South African EIA regulations, their guidance on addressing cumulative impacts is acknowledged. This includes analysing the interaction of project impacts with other human activities and natural drivers affecting Valued Environmental and Social Components (VECs). During financial close and subsequent phases, the project will incorporate additional measures to align with international standards where necessary.

This cumulative impact assessment provides a foundation for understanding the broader environmental and social context of the proposed NPP. It evaluates the additive effects of the project in conjunction with other renewable energy developments within the region and other developments in the broader area, with the goal of proposing actionable measures to mitigate cumulative impacts where feasible. These measures will be detailed in the Environmental and Social Management Plans (ESMPs) and broader Environmental and Social Management System (ESMS) as the project progresses. Cumulative impacts with existing and planned facilities may occur during construction and operation of the proposed NPP. While one project may not have a significant negative impact on sensitive resources or receptors, the collective impact of the projects may increase the severity of the potential impacts.

Therefore, a number of projects within the surrounding area that have submitted applications for environmental authorisation (some of which have been approved) have been considered. The projects considered are from the latest REEA database from the DFFE (2025Q3). It is important to note that the existence of an approved EA does not directly equate to actual development of the project. Furthermore, during the pre-application virtual public meetings held on 01 and 02 December 2025, the members of the public were encouraged to inform the EAP of any new projects within the broader area that they may be aware of. No response to such requests has been received to date.

The proposed NPP is not located within one of the promulgated Renewable Energy Development Zones (REDZ). The projects located within a 50 km radius of the sites that should be considered in the cumulative impact assessment is included in Figure 10-1, Figure 10-2, Table 10-26 and Table 10-27.

The cumulative impact assessments from the scoping phase specialist reports, where relevant are provided below.

10.5.1 AIR QUALITY

10.5.1.1 Bantamsklip

Proposed developments at Bantamsklip include a Wave Energy Converter and an Abalone Farm with solar array (**Table 10-26, Figure 10-2**).

The proposed developments are unlikely to result in air quality impacts when operational, and the impacts from construction activities are likely to be localised. Only construction of the solar array is likely to result in noticeable fugitive dust emissions. Given the distance away from Bantamsklip, the potential for cumulative impacts is very low.

10.5.1.2 Thyspunt

Proposed developments within the area are all renewable projects, e.g. PV Solar plants and Wind Energy facilities. A list of 25 approved renewable projects and one pending approval within a 50 km of the project site was provided by WSP as per the Renewable Energy EIA Applications (REEA) dataset for Q3 2025 (**Table 10-27, Figure 10-2**).

The operational phase of both PV Solar Plants and Wind Farms will not result in air pollution emissions other than maintenance vehicles on the roads. It is primarily the construction phase that is of concern relating to the potential for air pollution impacts.

The main pollutants of concern are particulate matter ($PM_{2.5}$ and PM_{10}) as a result of mainly construction activities, and from mobile and stationary equipment using diesel as fuel. Gaseous pollutants from diesel combustion include SO_2 , oxides of nitrogen (NO_x), CO, Total Organic Carbons (TOC) and hydrocarbons (HC). Diesel combustion typically results in higher particulate emissions and referred to as diesel particulate matter (DPM) due to their respirable size. Gaseous emissions are mainly associated with vehicle emissions and likely to be at low levels.

Typical construction activities at renewable facilities include:

- Vehicle tailpipe emissions from construction vehicles and equipment,
- Road construction (internal roads);
- Foundation construction (roads, fences, etc.);
- Mounting of the supporting structures;
- Solar panels and inverters installation and connection or wind turbine installation; and
- Cable and overhead powerline.

These activities are similar to the ones assessed for the construction of the NPP. The impacts are expected to be localised and up to a distance of 2.1 km. It is unlikely that all the approved projects would start construction simultaneously. However, construction activities could result in short-term exceedances of PM_{10} and $PM_{2.5}$, and unacceptable dustfall rates in the vicinity of these activities if not mitigated. Should some of these developments start construction simultaneously, the cumulative impact could be significant for the duration of the construction phases, which would typically be between 12 to 18 months.

10.5.2 SURFACE WATER

The expected cumulative impacts during the construction phase include:

- Establishment of additional road networks: Concentrated flows and redirection of flow paths.
- Building of houses and commercial centres: Increased hardened surfaces causing concentrated and increased runoff.

- Spoil heaps: Concentrated flows and redirection of flow paths.
- Traffic on roads: Potential pollution due to vehicles.
- The expected cumulative impacts during the operational phase include:
- Power lines and pylons: Increased hardened surfaces at pylon bases causing redirection of flow paths.
- Traffic on roads: Potential pollution due to vehicles.
- Residential and commercial activities: Potential pollution due to spillages. Increased hardened surfaces causing concentrated and increased runoff and increase in downstream flood levels.

10.5.3 MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE

At Thyspunt, the dominant eastward longshore transport suggests that sediment plumes generated by repeated disposal events could be transported along consistent pathways, potentially resulting in cumulative hotspot effects in nearshore areas. While sediment transport at Bantamsklip shows no clear evidence of persistent unidirectional drift. As a result, transport pathways at Bantamsklip may be more dispersed, which could reduce the likelihood of cumulative plume impacts, although this remains subject to confirmation through site-specific spoil disposal modelling and disposal location.

Furthermore, at Thyspunt, if spoil (beach nourishment) on the St Francis beaches is implemented, these concurrent works substantially increase system complexity and the risk of cumulative impacts, especially if volumes placed are well above natural transport rates. Although this option warrants further detailed investigation, the present scoping assessment does not consider it beyond the contextual discussion provided above.

10.5.4 FAUNA AND INVERTEBRATES

Project impacts are often assessed by comparing the predicted post-development condition to a pre-development baseline. Where a project can be considered in isolation, this approach is generally adequate. However, both the Bantamsklip and Thyspunt receiving environments occur within landscapes that have already been influenced by historical and ongoing human activities (e.g., roads, fencing, settlement expansion, agriculture, altered fire regimes, and existing power/linear infrastructure). In such contexts, the “baseline” at the time of assessment may already represent a shifted baseline (i.e., a system that has deviated materially from its original ecological state). It is therefore appropriate to consider cumulative effects, where the impacts of the proposed NPP add to (or interact with) pre-existing pressures and reasonably foreseeable future development, resulting in an overall effect greater than the NPP’s isolated footprint.

This section describes the potential cumulative impacts of the proposed NPP and associated infrastructure on fauna (vertebrates and invertebrates) and their supporting habitats, with particular focus on sensitive receptors (e.g., intact coastal habitats, wetlands/water resources, ecological corridors, and SCC).

At a scoping level, the cumulative impacts most likely to be material for the animal theme are:

- Long-term, additive habitat loss and fragmentation reducing resilience and persistence potential of sensitive taxa;
- Cumulative light pollution, which can substantially increase the operational impact footprint for invertebrates and indirectly affect vertebrate assemblages; and
- Cumulative invasive species risk, particularly where establishment results in irreversible or difficult-to-reverse ecosystem change.

Before and after mitigation, these impacts are expected to be Very High.

Cumulative impacts cannot be managed solely through footprint minimisation; they require project-lifecycle controls that reduce the project's additive contribution to broader pressures:

- Avoidance-first spatial planning: demonstrate avoidance of high-SEI habitats and key corridors at layout finalisation.
- Connectivity design package: fauna crossings at priority points, wildlife-permeable fencing solutions where feasible, and minimised new linear barriers.

Lighting Management Plan (mandatory):

- Spectrum controls (exclude short-wavelength emissions visible from natural habitats);
- Shielding and directional control;
- Intensity minimisation and triggered lighting (motion sensors); and
- Auditability (specification-based procurement and compliance checks).

Biosecurity and invasive species programme (mandatory):

- Inspection/quarantine procedures for incoming materials and equipment;
- Early detection monitoring and rapid response protocols;
- Strict waste management to reduce pest attraction and secondary invasions;
- Traffic and roadkill management: speed enforcement, night driving limits, collision monitoring and adaptive interventions;
- Fire management alignment: ensure site operations do not exacerbate inappropriate fire frequency/intensity in surrounding natural habitats; and
- Offset consideration (where residual impacts remain): particularly relevant where cumulative loss contributes to threshold effects (e.g., corridor severance, high-significance invertebrate habitat loss).

10.5.5 TERRESTRIAL

10.5.5.1 Bantamsklip

The Bantamsklip area is subject to existing and approved marine- and coastal-related developments that contribute to the cumulative environmental context of the site. These include the approved construction and operation of a wave energy converter adjacent to the Abagold Farms near Hermanus and an approved abalone farming development with an associated solar array on a portion of Remaining Extent of Farm 385 near Pearly Beach. While these projects are spatially discrete, they collectively contribute to increased development pressure within the broader coastal and marine environment, with potential cumulative implications for habitat disturbance, ecological processes and landscape character.

10.5.5.2 Thyspunt

The Thyspunt area occurs within a broader regional landscape that has experienced substantial renewable energy development, particularly wind energy facilities and associated infrastructure within the Kouga and Koukamma Local Municipalities. Numerous wind energy projects, including the Impofu North, East and West Wind Farms, the Jeffrey's Bay, Ubuntu, Kouga, Red Cap Kouga, Happy Valley, Deep River and Tsitsikamma Community Wind Energy Facilities, have been granted EA, together with several associated amendments, battery energy storage systems and supporting infrastructure. While some associated projects, such as specific battery energy storage systems and powerline developments, have been refused authorisation, the cumulative footprint of approved wind energy and energy related developments contributes to increasing transformation, fragmentation and disturbance of the regional terrestrial environment. The concentration of these developments within the broader area has the potential to result in cumulative impacts on habitat connectivity,

ecological processes, avifaunal movement, landscape character and ecosystem resilience, which must be considered in assessing the overall cumulative impact of the proposed development.

10.5.6 AQUATIC ECOSYSTEMS

The cumulative impacts include:

- Impacts associated with transmission line corridors to either site;
- Indirect impacts associated with locally increased populations in the broader areas, with accommodation and servicing (water and sanitation) requirements likely to increase for both construction and operational phase workforces, as well as for jobseekers; and
- Impacts associated with the construction of security fences around the broader sites.

10.5.7 MARINE ECOLOGY

The proposed NPP developments are expected to result in localized environmental pressures, primarily associated with habitat disturbance, construction activities, and operational discharges. However, the cumulative impacts in the broader regional context are considered moderate prior to mitigation and low post-mitigation. While there are no proposed or authorised EAs that will overlap with any of the marine ecology and fisheries impacts identified in this report, there is a proposed, authorisation has been granted for a proposed abalone farm, with solar array near Pearly Beach (some 6.5 km west of Bantamsklip). Abalone farm operations tend to produce low volume, high quality seawater discharge from the on-land holding tanks. While it is not clear if there are other effluent streams authorised for discharge at this site, it is highly unlikely that any such discharges will overlap spatially with the proposed NPP discharges. Should such overlaps occur, the high-quality effluent volume from the abalone farm is unlikely to compound any impacts from the NPP discharges. Rather, there is a small risk that the construction and operation of the Bantamsklip NPP, if unmitigated, may result in changes in intake water quality for the farm, with potential impacts to operations and stock well-being.

This assessment is supported by the absence of other similar industrial or coastal developments in proximity to the site, meaning that additive effects from multiple developments are minimal. Consequently, while site-specific impacts may occur, the overall regional cumulative pressure on marine and coastal ecosystems is low, and no significant exacerbation of existing environmental stressors is anticipated. Mitigation measures (as put forward here) focusing on habitat protection, sediment control, and monitoring of marine resources will further reduce the potential for cumulative impacts. This assessment applies to both Thyspunt and Bantamsklip.

10.5.8 SOCIO-ECONOMIC

Cumulative social impacts have been identified conceptually but could not be assessed in detail due to limited information on the timing and scale of other planned or future developments in the area. Examples of cumulative impacts include traffic congestion and accidents due to increases in vehicular traffic on community roadways (International Finance Corporation, 2021, p. 7).

10.5.9 HERITAGE

The cumulative impact of a development is the impact that development will have when its impact is added to the incremental impacts of other past, present or reasonably foreseeable future activities that will affect the same environment. It is important to note that the cumulative impact assessment for a particular project, like what is being done here, is not the same as an assessment of the impact of all surrounding projects. The cumulative assessment for this project is an assessment only of the

impacts associated with this project but seen in the context of all surrounding impacts. It is concerned with this project's contribution to the overall impact, within the context of the overall impact. But it is not simply the overall impact itself.

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

In terms of cumulative impacts to heritage resources, impacts to archaeological and palaeontological resources are sufficiently dealt with on a case by case basis. The primary concern from a cumulative impact perspective would be to the cultural landscape. The cultural landscape is defined as the interaction between people and the places that they have occupied and impacted. In some places in South Africa, the cultural landscape can be more than 1 million years old where we find evidence of Early Stone Age archaeology (up to 2 million years old), Middle Stone Age archaeology (up to 200 000 years old), Later Stone Age archaeology (up to 20 000 years old), evidence of indigenous herder populations (up to 2000 years old) as well as evidence of colonial frontier settlement (up to 300 years old) and more recent agricultural layers.

Modern interventions into such landscapes, such as industrial development, constitute an additional layer onto the cultural landscape. The primary risk in terms of negative impact to the cultural landscape resulting from development lies in the eradication of older layers that make up the cultural landscape. In terms of impacts to heritage resources, it is preferred that new electricity generation infrastructure is concentrated in one location and is not sprawled across an otherwise rural or agricultural landscape.

The development of a nuclear power plant at either Thyspunt or Bantamsklip will impact on landscapes characterised as having a sense of place with strong coastal wilderness qualities. Based on the current footprint of the Koeberg nuclear power plant along the West Coast, the footprint of the new facility will largely fall on an area of about 1km long x 500m wide. This is much smaller than a typical solar PV farm or a wind energy facility. Furthermore, the development of a nuclear power plant will not lead to a rapid development of additional nuclear power plants in the same area. However, the associated overhead powerlines needed to connect the power plant to the national grid will increase the negative impact on the cultural landscape sensitivities present at both sites. At Bantamsklip this will be an acute impact there are hardly any large electrical distribution lines present near the study site. At Thyspunt, the rapid development of wind farms bordering the study area has already created a large network of new powerlines since the 2012 HIA and has severely degraded the rural setting surrounding Thyspunt. Another powerline at Thyspunt will therefore add to an existing network of powerlines and the significance of this impact will largely rest on whether Thyspunt Cultural Landscape is formally protected as a National Heritage Site. If this declaration is finalised under Section 27 of the NHRA then a new powerline through the NHS will not be acceptable.

10.5.10 VISUAL

Cumulative landscape and visual effects (impacts) result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments

(associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future. They may also affect how the landscape is experienced, and cumulative effects may be positive or negative. Where they comprise a range of benefits, they may form part of the mitigation measures. In relation to an activity, cumulative impact therefore means “the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may be significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities” (NEMA EIA Reg GN R982 of 2014).

Cumulative increases cannot be measured empirically. However, it can be assumed that, as visual impacts reduce exponentially with distance, conversely doubling the size and volume of a development may increase the impact exponentially.

Cumulative effects can also arise from the intervisibility of a range of developments and the combined effects of individual components of the proposed development occurring in different locations or over a period of time. The separate effects of such individual developments may not be significant, but they may adversely impact visual receptors within their combined visual envelopes. Intervisibility depends upon general topography, aspect, vegetative cover or other visual obstruction, elevation and distance, as this affects visual acuity, which is also influenced by weather and light conditions (LI-IEMA (2013)).

10.5.10.1 Bantamsklip

The cumulative effect of the NPP is significant in the context of the site. There is currently little visible development around the study area, and the area is considered relatively pristine. The only activity in the area that is industrial in nature is the abalone farms near Buffeljachtbaai and the two adjacent wind turbines. The rest of the surrounding activities are nature based such as nature reserves and agricultural. The introduction of a very large and visually dominant NPP together with the associated power grid system will greatly increase the cumulative effect of an industrial component in a rural natural setting.

The significance of the cumulative effect of the NPP on the surrounding area is considered high due to the lack of significant visible industrial structures and activities. Night lighting in the form of security and safety requirements will significantly increase the impact of night lighting on the relatively dark rural night sky.

10.5.10.2 Thyspunt

The cumulative effect of the NPP is significant in the context of the site. There is currently little visible development around the study area, and the area is considered relatively pristine. There are several wind farms to the north and west of Oyster Bay and are more than 5 km away. These tall structures provide an industrial ambience that will be added to the industrial image that the NPP will introduce to the area. The combined effect of proposed NPP project and the existing wind farms would cause a major change the nature, sense of study and character of the sub-region's landscape's baseline.

The night lighting from safety and security lighting will compound the impact of the night lights from the chokka boats that work in the bay.

The significance of the cumulative effect of the NPP on the surrounding area is moderate due to the tempering effect of the existing wind turbine farms and associated power distribution infrastructure

and the night lighting that is already compromised by the chokka fishing boat that are active in the area.

10.5.11 CLIMATE CHANGE

Cumulative climate change impacts are considered in relation to GHG emissions and their contribution to global climate change, rather than as geographically localised cumulative effects. This approach reflects the global and non-localised nature of GHG emissions, which accumulate in the atmosphere and exert their effects at a planetary scale, irrespective of the point of origin.

Consistent with Section 24 of NEMA and relevant judicial precedent, the CCIA will assess cumulative emissions at the project level, consolidating emissions from all interdependent components of the proposed NPP and its associated infrastructure that fall within the scope of this EIA process. This will include emissions arising across the construction, operation and maintenance phases of the project, as well as relevant upstream and downstream lifecycle processes where information is reasonably available.

The CCIA will not attempt to aggregate or model emissions from unrelated existing or future third-party developments, alternative generation projects, or national-scale electricity system changes, as such assessments fall outside the scope and mandate of a project-level CCIA. Instead, the Project's consolidated emissions profile will be contextualised within South Africa's national GHG inventory, emissions trajectory and carbon-budget framework, with the intention to support the competent authority's cumulative evaluation under section 24O(1)(b) of NEMA.

Detailed quantification of cumulative lifecycle emissions and their relative contribution to national and global emissions will be undertaken during the EIA-phase CCIA, based on refined project information and updated activity data.

10.5.12 TRAFFIC

The cumulative and seasonal effects include the interaction of project-related traffic with seasonal tourism peaks and other planned developments in the region.

10.6 EXISTING DEVELOPMENTS IDENTIFIED IN THE SITE VICINITY

10.6.1 BANTAMSKLIP

In the northern section, the Bantamsklip site partially overlaps with the Walker Bay Nature Reserve.

Franskraalstrand (20 km) and Pearly Beach (7 km) are mainly holiday villages with small, retired communities. To the south-east, the coast is largely undeveloped except for a few homes at Buffeljachtbaai and an abalone farm near Plaatjieskraalbaai.

Northeast of the R43, the land consists mostly of private farmland and nature reserves, including part of Agulhas National Park bordering the study area. The surroundings are sparsely populated, especially towards Quoin Point. Pearly Beach is the largest community within 15 km from the site.

10.6.2 THYSPUNT

The land use between the coast and the ridgeline of inland vegetated dunes is primarily nature reserve. The western edge of the reserve abuts the coastal village of Oyster Bay while the eastern edge borders land that is undeveloped and in private ownership. This land has several private

houses, mostly holiday homes which are built near the edge of the consolidated dunes and overlook the rocky seashore. St. Francis Bay is located at the eastern edge of the site.

A prior township application was submitted for Rocky Coast Farm near Cape St. Francis's western boundary. The current proposal suggests clustering new homes near existing residences, with the remaining land designated as a nature reserve.

The Impofu Wind Farms are located north of the Thyspunt site, adjacent to the proposed NPP Eskom property.

10.7 SURROUNDING RENEWABLE ENERGY PROJECTS

10.7.1 BANTAMSKLIP

Figure 10-1 indicates the renewable projects in the surrounding area within 50 km of the Bantamsklip site, as per the REEA dataset for Q3 2025. The list of these projects along with the type of technology, associated permitting process they are subjected to, and applicant are included in **Table 10-26**. The table further highlights whether the projects have been approved, in the process of being approved or rejected, and the distance of each project to the Bantamsklip site.

Table 10-26 – Approved renewable projects within 50 km of the Bantamsklip site

PROJECT NAME	EAP	STATUS	DFFE REFERENCE NUMBER	DISTANCE AWAY
The Proposed Construction and Operation of a Wave Energy Converter Adjacent to the Abagold Farms, Hermanus, Western Cape Province	Anchor Environmental CC	EA granted (3 MW)	12/12/20/2405	41.6 km
Proposed Abalone Farm, with solar array on a Ptn of Rem Farm 385, Pearly Beach	Unknown	EA granted (MW Unknown)	16/3/3/1/E2/29/1021/20	10.1 km

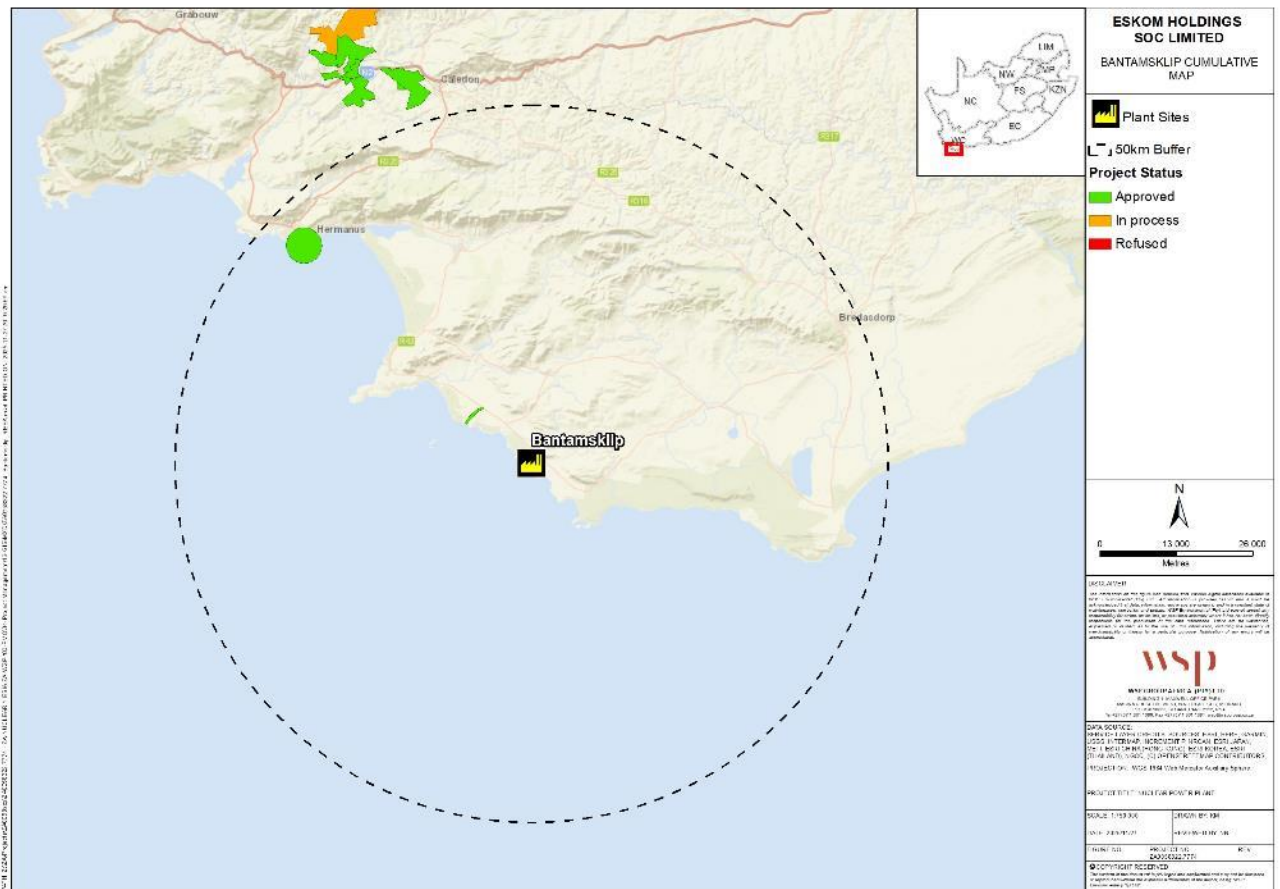


Figure 10-1 – Existing surrounding projects within 50 km of the Bantamsklip site (REEA, Q3 2025)

10.7.2 THYSPUNT

Figure 10-2 indicates the renewable projects in the surrounding area within 50 km of the Thyspunt site, as per the REEA dataset for Q3 2025. The list of these projects along with the type of technology, associated permitting process they are subjected to, and applicant are included in **Table 10-27**. The table further highlights whether the projects have been approved, in the process of being approved or rejected, and the distance of each project to the Thyspunt site.

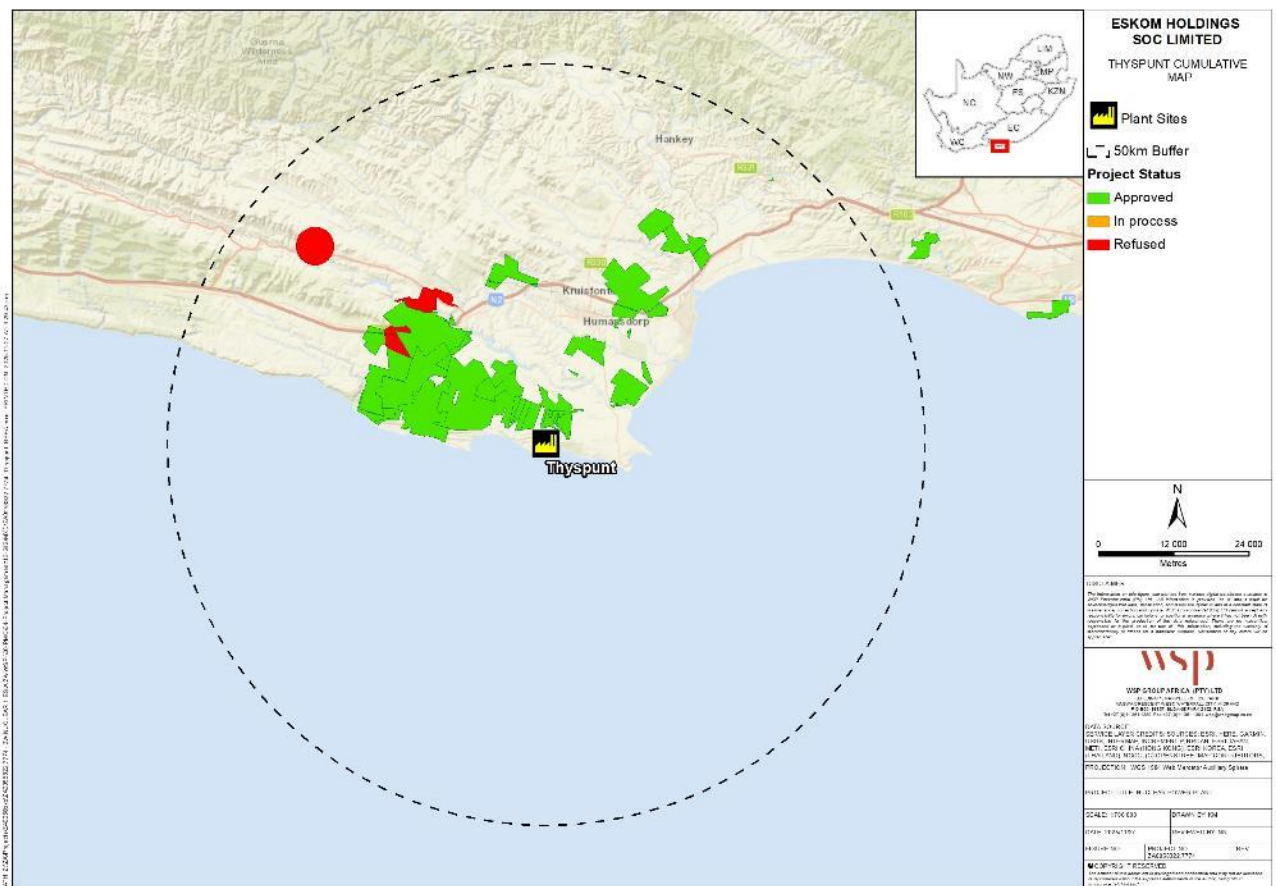
Table 10-27 – Approved renewable projects within 50 km of the Thyspunt site

PROJECT NAME	EAP	STATUS	DFFE REFERENCE NUMBER	DISTANCE AWAY
Proposed establishment of battery energy storage systems for the Impofu wind farms (north), Kouga Local Municipality, Eastern Cape Province.	CEN Integrated Environmental Management Unit	EA Refused	14/12/16/3/3/1/2453	18.7 km
The proposed establishment of battery energy storage systems for the Impofu wind farms (east), Kouga Local Municipality, Eastern Cape Province.	CEN Integrated Environmental Management Unit	EA Refused	14/12/16/3/3/1/2454	11.2 km

PROJECT NAME	EAP	STATUS	DFFE REFERENCE NUMBER	DISTANCE AWAY
Establishment of a wind energy facility and associated infrastructure on a site near Oyster Bay, Kouga Local Municipality, Eastern Cape	Savannah Environmental (Pty) Ltd	EA Granted (160 MW)	12/12/20/1585	4.9 km
Establishment of a wind energy facility and associated infrastructure on a site near Oyster Bay, Kouga Local Municipality, Eastern Cape	Savannah Environmental (Pty) Ltd	Amendment Granted (0 MW)	12/12/20/1585/A5	4.9 km
Establishment of a wind energy facility and associated infrastructure on a site near Oyster Bay, Kouga Local Municipality, Eastern Cape	Savannah Environmental (Pty) Ltd	Amendment Granted (0 MW)	12/12/20/1585/AM6	4.9 km
Establishment of a wind energy facility and associated infrastructure on a site near Oyster Bay, Kouga Local Municipality, Eastern Cape	Savannah Environmental (Pty) Ltd	Amendment Granted (0 MW)	12/12/20/1585/AM7	6.7 km
Proposed Jeffrey's Bay Wind Energy Project, Kouga Local Municipality, Eastern Cape Province	Council for Scientific and Industrial Research	EA Granted (133.9 MW)	12/12/20/1718	18.4 km
Proposed Ubuntu Wind Energy project near Jeffreys Bay Eastern Cape	Council for Scientific and Industrial Research	EA Granted (100 MW)	12/12/20/1752	30.3 km
The Kouga Wind Farm in the Kouga Local Municipality, Eastern Cape Province	Savannah Environmental (Pty) Ltd	EA Granted (MW Unknown)	12/12/20/1756	2.2 km
The Kouga Wind Farm in the Kouga Local Municipality, Eastern Cape Province	Savannah Environmental (Pty) Ltd	Amendment Granted (110 MW)	12/12/20/1756/1	2.2 km
The Kouga Wind Farm in the Kouga Local Municipality, Eastern Cape Province	Savannah Environmental (Pty) Ltd	Amendment Granted (0 MW)	12/12/20/1756/1/AM4	2.2 km
Red Cap Kouga Wind Farm - Oyster Bay	Savannah Environmental (Pty) Ltd	EA Granted (77.6 MW)	12/12/20/1756/2	12.4 km
Happy Valley wind energy facility on a site near Humansdorp	Savannah Environmental (Pty) Ltd	EA Granted (40 MW)	12/12/20/1861	20.9 km
Happy Valley wind energy facility on a site near Humansdorp	Savannah Environmental (Pty) Ltd	Amendment Granted (0 MW)	12/12/20/1861/AM1	20.9 km
Proposed establishment of the Deep River wind energy facility near Humansdorp	Savannah Environmental (Pty) Ltd	EA Granted (100 MW)	12/12/20/1863	19.5 km
Development Plan for the Tsitsikamma Community Wind Energy Facility in the Tsitsikamma Area, Eastern Cape Province	Coastal and Environmental Services	EA Granted (100 MW)	12/12/20/2209	15.2 km

PROJECT NAME	EAP	STATUS	DFFE REFERENCE NUMBER	DISTANCE AWAY
Proposed solar power project of approximately 4.5MW on farm Broadlands near Humansdorp in the Kouga municipal area	Unknown	In process (4.5 MW)	12/12/20/2236	14.1 km
The Proposed 50 Mw Wind Energy Project on the Broadlands and Saragossa Farms Near Humansdorp in the Kouga Municipal Area, Eastern Cape Province	Unknown	EA Granted (MW Unknown)	12/12/20/2289	10.2 km
The Banna ba Pifhu 30.0 MW wind energy facility on the Broadlands farm near Humansdorp in the Kouga local municipality of the Cacadu district municipality, Eastern Cape Province	Arcus Consultancy Services South Africa (Pty) Ltd	EA Granted (MW Unknown)	12/12/20/2289/AM2	10.2 km
Proposed establishment and operation of a battery energy storage system and associated infrastructure for the Mpofu wind farm (east) Kouga LM, Eastern Cape	CEN Integrated Environmental Management Unit	EA Granted (MW Unknown)	14/12/16/3/3/1/2566	11.2 km
Proposed establishment and operation of a battery energy storage system and associated infrastructure for the Mpofu wind farm (West) Kouga LM, Eastern Cape	CEN Integrated Environmental Management Unit	EA Granted (MW Unknown)	14/12/16/3/3/1/2567	17 km
Proposed establishment and operation of a battery energy storage system and associated infrastructure for the Mpofu wind farm (North) Kouga LM, Eastern Cape	CEN Integrated Environmental Management Unit	EA Granted (MW Unknown)	14/12/16/3/3/1/2568	18.7 km
The proposed powerline linking Tsitsikama community wind energy facility to the proposed extension of the existing Deip River substation in the Tsitsikama area, Eastern Cape Province	Savannah Environmental (Pty) Ltd	EA Refused	14/12/16/3/3/1/699	20.6 km
Proposed electrical power Co-Generation plant located on ERF 637, Port Elizabeth, Eastern Cape Province	SRK Consulting (Pty) Ltd	EA Granted (19.3 MW)	14/12/16/3/3/1/813	46.3 km
Impofu North Wind Farm and Associated Infrastructure, Oyster Bay, Eastern Cape Province	Aurecon South Africa (Pty) Ltd	EA Granted (198 MW)	14/12/16/3/3/2/1102	16.5 km
The 182MW Impofu North wind farm and its associated infrastructure near Oyster Bay within the Kouga and Koukamma municipalities	Zutari (Pty) Ltd	EA Granted (MW Unknown)	14/12/16/3/3/2/1102/AM1	16.5 km
Impofu West Wind Farm and Associated Infrastructure, Oyster Bay, Eastern Cape Province	Aurecon South Africa (Pty) Ltd	EA Granted (174 MW)	14/12/16/3/3/2/1103	15.4 km

PROJECT NAME	EAP	STATUS	DFFE REFERENCE NUMBER	DISTANCE AWAY
Impofu East Wind Farm and Associated Infrastructure, Oyster Bay, Eastern Cape Province	Aurecon South Africa (Pty) Ltd	EA Granted (198 MW)	14/12/16/3/3/2/1104	4.8 km
The 189MW Impofu East wind farm and its associated infrastructure near Oyster Bay within the Kouga and Koukamma municipalities	Zutari (Pty) Ltd	EA Granted (MW Unknown)	14/12/16/3/3/2/1104/AM1	4.8 km
Proposed AES solar PV installation within Khai-Ma Local Municipality, Northern Cape Province	Environmental Impact Management Services (Pty) Ltd	EA Refused	14/12/16/3/3/2/572	37.4 km



10.8 SUMMARY OF IMPACT SIGNIFICANCE SCREENING

This section presents a summary outlining the likely significance of potential impacts identified for the construction, operational, decommissioning phases (Table 10-28) and potential cumulative impacts (

Table 10-29). This is used as a guide to determine whether additional assessment may be required in the EIA phase. Impacts will be refined and assessed during the EIA phase.

Table 10-28 – Significance of Potential Impacts

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
Air Quality	PM ₁₀ Concentrations and Dustfall rate	Negative	C	High (B, T)	Moderate (B, T)
	PM ₁₀ , SO ₂ , NO ₂ , CO, Ammonia and Formaldehyde Concentrations	Negative	O	Moderate (B, T)	Low (B, T)
	PM ₁₀ , SO ₂ , NO ₂ , and CO Concentrations, and Dustfall rates	Negative	D	High (B, T)	Moderate (B, T)
Dune Geomorphology	Development on mobile dunes	Negative	C	High (T)	Moderate (T)
				NA at B (no mobile dunes)	
	Development on artificially vegetated dunes	Negative	C	Moderate (B, T)	Low (B, T)
	Development on naturally vegetated dunes	Negative	C	Moderate (B, T)	Low (B, T)
		Negative	O	Low (B)	Low (B)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Geomorphologic conservation value			High (T)	Moderate (T)
	Access roads across the fixed, vegetated dunes: Eastern and Western Access Roads	Negative		Low (T)	Low (T)
				Moderate (T)	Low (T)
	Construction of transmission lines across the mobile, unvegetated dunes	Negative		Moderate (T)	Low (T)
	Construction of transmission lines across the fixed, vegetated dunes	Negative		Moderate (T)	Low (T)
	Impacts due to climate change	Negative		Low (T)	Very Low (T)
Geohydrology	Depletion of aquifer(s) by nuclear footprint excavation dewatering	Negative	C	Low (B, T)	Very Low (B, T)
	Depletion of aquifer(s) by dewatering	Negative	O	Low (B, T)	Very Low (T)
	Depletion of aquifer(s) by pumping for water supply	Negative	C, O	Low (T)	Very Low (T)
				NA at B	
	Groundwater contamination	Negative	C, O, D	Low (B, T)	Very Low (B, T)
	Release of radioactivity	Negative	O	Low (B, T)	Very Low (B, T)
Freshwater	Depletion of aquifers	Negative	C	Low (T)	Very Low (T)
				NA at B	

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Impact on surf zone	Negative	C	High (B, T)	Low (B, T)
		Negative	O	Low (B, T)	Very Low (B, T)
	Effect of brine on surf zone	Negative	C, O	High (B, T)	Very Low (B, T)
	Wastewater disposal	Negative	O	Moderate (B, T)	Low (B, T)
Surface Water	Increase in Runoff	Negative	C, O	Moderate (B, T)	Low (B, T)
	Increase in Erosion	Negative	C, O	Moderate (B, T)	Low (B, T)
	Changes in Flow Path	Negative	C, O	Moderate (B, T)	Low (B, T)
	Pollution of surface water	Negative	C, O	Moderate (B, T)	Low (B, T)
Marine Physical, Water Quality, Sediment Transport and Shoreline Change	On-beach placement: Sediments on the bottom and thickness	Negative	C, O	Moderate (B, T)	Low (B, T)
	On-beach placement: Turbidity and suspended sediments	Negative	C, O	Moderate (B, T)	Low (B, T)
	On-beach placement: Ecology (smothering and direct loss/disturbance of benthic habitat)	Negative	C, O	Moderate (B, T)	Low (B, T)
	Nearshore disposal: Sediments on the bottom and thickness	Negative	C, O	High (B, T)	Moderate (B, T)
	Nearshore disposal: Turbidity and suspended sediments	Negative	C, O	Moderate (B, T)	Low (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Nearshore disposal: Ecology (smothering and direct loss/disturbance of benthic habitat)	Negative	C, O	High (B, T)	Moderate (B, T)
	Offshore disposal: Sediments on the bottom and thickness	Negative	C, O	High (B, T)	Moderate (B, T)
	Offshore disposal: Turbidity and suspended sediments	Negative	C, O	Moderate (B, T)	Low (B, T)
	Nearshore disposal: Ecology (smothering and direct loss/disturbance of benthic habitat)	Negative	C, O	Moderate (B, T)	Low (B, T)
	Spoil disposal impacts on surf breaks	Negative	O	Very Low (B)	Very Low (B)
				Moderate (T)	Low (T)
	Dredging – Seabed excavation, morphology change and coastal processes	Negative	C, O	Moderate (B, T)	Low (B, T)
	Dredging – Water quality: plumes, turbidity, suspended sediments, and (where relevant) contaminants	Negative	C, O	High (B, T)	Moderate (B, T)
	Dredging – Ecology: direct habitat loss/disturbance and indirect effects (smothering)	Negative	C, O	Moderate (B, T)	Low (B, T)
	Dredging – Construction and operational impacts	Negative	C, O	Low (B, T)	Very Low (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Short term disruption of sediment transport	Negative	C	Low (B, T)	Low (B, T)
	Local scour around temporary works	Negative	C	Low (B, T)	Low (B, T)
	Dune/backshore disturbance	Negative	C	Moderate (B, T)	Low (B, T)
	Beach erosion due to on-beach or surf zone outfall discharge	Negative	C	Moderate (B, T)	Low (B, T)
	Local sediment transport disruption from permanent structures – pipelines	Negative	O	Low (B, T)	Very Low (B, T)
	Local sediment transport disruption from permanent structures – intake stilling basin and outfall structure	Negative	O	Moderate (B)	Low (B)
				High (T)	Moderate (T)
	Exposure of buried pipelines/structures due to future erosion	Negative	O	Very Low (B, T)	Very Low (B, T)
	Pipeline outfall exposure/scour to adjacent areas risk under future erosion	Negative	O	Low (B, T)	Very Low (B, T)
	Shoreline and sedimentary budget changes due to spoil	Negative	O	Moderate (B, T)	Low (B, T)
	Long-term coastline recession (SLR and climate change)	Negative	O	Very High (B, T)	Very Low (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Wave-climate-driven shoreline rotation / planform change	Negative	O	Low (B, T)	Very Low (B, T)
	Event-driven storm erosion overlay (cross-shore beach erosion during storms)	Negative	O	Low (B, T)	Very Low (B, T)
	Localised rocky-coast retreat where erodible deposits occur	Negative	O	Very Low (B, T)	Very Low (B, T)
	Chronic sedimentation at intakes	Negative	O	Low (B, T)	Low (B, T)
	Storm-driven “pulse” sand ingress at intakes	Negative	O	Low (B, T)	Low (B, T)
	Tsunami-driven erosion/deposition	Negative	C	Very Low (B, T)	Very Low (B, T)
	Elevated salinity in surf-zone and nearshore environments due to desalination brine discharges during construction stage	Negative	C	High (B, T)	Low (B, T)
	Beach erosion due to on-beach or surf zone outfall discharge	Negative	C	Moderate (B, T)	Low (B, T)
	Plume dispersion of brine (stilling basin and raceway or offshore tunnel intake and outfall)	Negative	C, O	Low (B, T)	Low (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Thermal plume dispersion (stilling basin intake and raceway outfall)	Negative	O	High (B, T)	Moderate (B, T)
	Thermal plume dispersion (offshore tunnel intake and outfall)	Negative	O	High (B, T)	Moderate (B, T)
	Damage to intake or outfall structures due to abnormal/extreme metocean conditions	Negative	O	Low (B, T)	Very Low (B, T)
	Blockage of intake pipes or outfall pipes	Negative	O	Moderate (B, T)	Low (B, T)
	Natural or climate-change-driven sea water temperature increases (impact to cooling system)	Negative	O	Low (B)	Very Low (B)
				Moderate (T)	Low (T)
	Recirculation of thermal plume (stilling basin intake and raceway outfall)	Negative	O	High (B, T)	Low (B, T)
	Recirculation of thermal plume (offshore tunnel intake and outfall)	Negative	O	Moderate (B)	Very Low (B, T)
				Low (T)	
	Flooding and inundation of the NPS due to distant tsunamis	Negative	O	Low (B, T)	Very Low (B, T)
	Flooding and inundation of the NPS due to local tsunamis	Negative	O	Low (B, T)	Very Low (B, T)
		Negative	O	Moderate (B)	Very Low (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Flooding and inundation of the NPS due to meteo-tsunamis			High (T)	
	Exposure of cooling water intake or outfall pipes	Negative	O	Low (B, T)	Low (B, T)
	Exposure of cooling water basin (intake) or raceway (outfall)	Negative	O	High (B, T)	Low (B, T)
	Inundation and scour-induced sedimentation impact to intake and outfall pipes	Negative	O	Low (B, T)	Low (B, T)
	Disruption of intakes and outfalls due to sediment transport and deposits	Negative	O	Moderate (B, T)	Low (B, T)
	Accidental spill	Negative	C, O	Moderate (B, T)	Low (B, T)
Geotechnical	Seismic Hazard	Negative	C, O, D	Moderate (B, T)	Low (B, T)
	Slope Stability	Negative	C	Low (B, T)	Very Low (B, T)
	Soil erosion from clearing of sites for drilling and test pitting	Negative	C	Very High (B, T)	Low (B, T)
	Potential Hydrocarbon (oils, fuels and chemicals) spillages during drilling (geotechnical investigations)	Negative	C	Very High (B, T)	Very Low (B, T)
	Volcanic Activity	Negative	C, O, D	Moderate (B, T)	Low (B, T)
	Surface Rupture	Negative	C, O, D	High (B, T)	Moderate (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
Agriculture	Loss of future agricultural production potential	Negative	C	Low (B, T)	Very Low (B, T)
		Negative	C	Moderate (T – inland)	Moderate (T i inland)
Fauna and Invertebrates	Vertebrates				
	Loss of habitat	Negative	C	Very High (B, T)	High (B, T)
	Encroachment of AIP species in disturbed areas	Negative	C	High (B, T)	Low (B, T)
	Direct mortality of fauna species, including possible SCCs	Negative	C	Very High (B, T)	High (B, T)
	Emigration of fauna	Negative	C	High (B, T)	Moderate (B, T)
	Reduced dispersal/migration of fauna	Negative	C	High (B, T)	Moderate (B, T)
	Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, light and dust	Negative	C	Very High (B, T)	High (B, T)
	Invertebrates				
	Loss of habitat	Negative	C	Very High (B, T)	High (B, T)
	Direct mortality of invertebrates, including SCCs confirmed to be present	Negative	C	Very High (B, T)	High (B)
					Moderate (T)
	Introduction of alien invasive invertebrate species	Negative	C	Very High (B)	High (B)
				High (T)	Moderate (T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Light pollution	Negative	C	Very High (B, T)	Low (B, T)
	Noise pollution, vibration	Negative	C	High (B)	Moderate (B, T)
				Moderate (T)	
	Dust pollution	Negative	C	High (B, T)	Low (B, T)
	Habitat fragmentation and movement restriction	Negative	O	High (B, T)	Moderate (B, T)
	Direct mortality of vertebrate species, mainly from road mortality (operational traffic)	Negative	O	Very High (B, T)	Moderate (B, T)
	Encroachment of alien and invasive species in disturbed areas	Negative	O	High (B, T)	Low (B, T)
	Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, light and dust	Negative	O	High (B, T)	Moderate (B, T)
	Direct mortality of invertebrate species	Negative	O	Very High (B, T)	High (B)
					Moderate (T)
	Introduction of alien invasive invertebrate species	Negative	O	Very High (B, T)	High (B, T)
	Light pollution impacts on invertebrates	Negative	O	Very High (B, T)	Low (B, T)
	Dust pollution impacts on invertebrates	Negative	O	High (B, T)	Low (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Direct mortality of fauna due to decommissioning activities	Negative	D	Very High (B, T)	High (B, T)
	Habitat degradation that drives displacement and longer-term population effects and persistence of post-decommissioning disturbance	Negative	D	Very High (B, T)	High (B, T)
Flora	Reduction in populations of threatened plant species	Negative	C	Moderate (B)	Low (B)
				High (T)	Moderate (T)
Terrestrial	No-go	Negative	O	High (B, T)	Low (B, T)
	Impacts on critical biodiversity areas	Negative	C	High (B, T)	High (B, T)
	Impacts on threatened ecosystems	Negative	C	Very High (B)	Very Low (T)
				High (B)	Very Low (T)
	Impacts on protected areas	Negative	C	Very High (B)	High (B)
				Very Low (T)	Very Low (T)
	Disruption of ecosystem processes	Negative	C	Very High (B, T)	High (B, T)
Aquatic Ecosystems	Establishment and spread of alien invasive plant species	Negative	O	High (B, T)	Low (B, T)
	Wetland loss and/or degradation	Negative	C, O, D	High (B)	Moderate (B)
	Wetland conservation	Negative	O, D	Very High (T)	High (T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
		Positive		Moderate + (B, T)	Very High + (B, T)
Marine	Intertidal habitat loss and disturbance	Negative	C	High (B, T)	Low (B, T)
	Subtidal habitat loss and disturbance	Negative	C	High (B, T)	Low (B, T)
	Pelagic open water habitats disturbance	Negative	C	Moderate (B)	Low (B, T)
				Low (T)	
	Smothering impacts on benthic fauna in sediment disposal area	Negative	C	Moderate (B, T)	Low (B, T)
	Turbidity impacts of sediment disposal on pelagic fauna	Negative	C	Low (B, T)	Low (B, T)
	Turbidity and smothering impacts of sediment disposal on squid stock and fishery	Negative	C	Very High (T)	Moderate (T) (dumping)
					Very Low (T) (no dumping)
	Below water noise impacts	Negative	C	High (B, T)	Moderate (B)
					Low (T)
	Impacts to marine biota due to brine discharge	Negative	C	High (B, T)	Low (B, T)
	Impacts on fisheries due to exclusion zones	Negative	C	Low (B, T)	Low (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	(Re)mobilisation of oxygen depleting substances, nutrients and noxious substances from disposed sediment	Negative	C	Moderate (B, T)	Low (B, T)
	Above water noise impacts	Negative	C	High (B)	Moderate (B)
				Low (T)	Very Low (T)
	Impacts of artificial lighting	Negative	C	Moderate (B, T)	Low (B, T)
	Disturbance and/or mortality of marine life due to the intake of seawater for desalination	Negative	C	Moderate (B, T)	Low (B, T)
	Impacts to marine biota due to discharge of desalination co-pollutants	Negative	C	Moderate (B, T)	Low (B, T) (WQG not met)
					Very Low (B, T) (WQG met)
	Discharge of sewerage effluent	Negative	C	Moderate (B, T)	Low (B, T) (WQG not met)
					Very Low (B, T) (WQG met)
	Impacts of highly saline discharge water (brine) diluted with cooling water	Negative	O	Low (B, T)	Low (B, T)
	Impacts of thermally elevated discharge water	Negative	O	Very High (B, T)	Moderate (B, T)
					High (B, T)
	Operational noise impacts	Negative	O	Low (T)	Low (T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Disturbance and/or mortality of marine life due to the intake of seawater	Negative	O	High (B, T)	Moderate (B, T)
	Potential impacts of co-pollutant discharges	Negative	O	Moderate (B, T)	Low (B, T)
	Potential impacts of exclusion areas on biodiversity	Negative	O	High (B, T)	NA (B, T)
	Potential impacts of exclusion areas on fisheries	Negative	O	High (T)	NA (T)
	Potential impacts of exclusion areas on fisheries and mariculture	Negative	O	Moderate (B)	NA (B)
	Spillage of hazardous substances on marine biota	Negative	C, O, D	Low (B, T)	Very Low (B, T)
	Unintentional discharge of polluted groundwater	Negative	C, O	Low (B, T)	Very Low (B, T)
	Collision risk due to increased vessel presence	Negative	C	Low (B, T)	Very Low (B, T)
	Radiation emissions	Negative	O	Low (T)	Low (T)
Avifauna	Habitat destruction within the project footprint	Negative	C	High (B, T)	Moderate (B, T)
	Destruction, degradation and fragmentation of surrounding habitats	Negative	C	High (B, T)	Low (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Displacement of avifaunal community (Including several SCC) due to disturbance such as noise, light, dust, vibration	Negative	C	High (B, T)	Moderate (B, T)
	Direct mortality from persecution or poaching of avifauna species and collection of eggs	Negative	C	High (B, T)	Low (B, T)
	Thermal Pollution of Water	Negative	O	High (B, T)	Low (B, T)
	Radiological Contamination (Accidental Release)	Negative	O	Low (B, T)	Very Low (B, T)
	Destruction and degradation of surrounding habitats	Negative	O	High (B, T)	Low (B, T)
	Bird Collisions with Cooling Towers and Large Structures and Other Associated Infrastructure	Negative	O	Moderate (B, T)	Low (B, T)
	Bird Disturbance due to Increased or Chronic Light and Sound Pollution	Negative	O	High (B, T)	Low (B, T)
	Direct mortality and disturbance from increased vehicle and human presence	Negative	O	High (B, T)	Low (B, T)
	Direct mortality due to earthworks, vehicle collisions and persecution	Negative	D	Moderate (B, T)	Low (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
	Inability of avifauna species to immigrate due to continued habitat degradation	Negative	D	Moderate (B, T)	Low (B, T)
	Radiological Contamination during Decommissioning	Negative	D	Moderate (B, T)	Very Low (B, T)
Socio-economic	Job creation	Positive	C	Very High + (B, T)	Very High + (B, T)
		Positive	O	High + (B, T)	High + (B, T)
		Positive	D	High + (B, T)	High + (B, T)
	Impacts Related to the Presence of Construction Workers	Negative	C	Very High (B, T)	High (B, T)
	Influx of job seekers	Negative	C	Very High (B, T)	High (B, T)
	Associated infrastructure development	Positive	C	High + (B)	High + (B)
				Very High + (T)	Very High + (T)
	Local economy	Positive	C	High + (B, T)	Very High + (B, T)
		Positive	O	High + (B, T)	Very High + (B, T)
	Loss of agricultural land	Negative	C	Low (B, T)	Very Low (B, T)
	Dust	Negative	C	Moderate (B, T)	Low (B, T)
	Noise	Negative	C	Moderate (B, T)	Low (B, T)
		Negative	O	Moderate (B, T)	Low (B, T)
	Visual	Negative	C	Moderate (B, T)	Moderate (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
		Negative	O	High (B, T)	High (B, T)
	Spatial planning	Positive	C	High + (B, T)	High + (B)
					Very High + (T)
	Devaluation of property	Negative	C	Moderate (B, T)	Moderate (B, T)
		Negative	O	High (B, T)	Moderate (B, T)
	Property values increase	Positive	C	Moderate + (B, T)	Moderate + (B, T)
	Fisheries	Negative	C	Moderate (B)	Low (B)
				Very High (T)	High (T)
		Negative	O	Moderate (B)	Moderate (B)
				Very High (T)	High (T)
	Community health, safety and security	Negative	C	High (B, T)	Moderate (B, T)
	Outward migration of construction workers	Negative	C	High (B, T)	Moderate (B, T)
	Traffic	Negative	C	High (B, T)	Moderate (B, T)
		Negative	O	High (B, T)	Moderate (B, T)
	Cultural Heritage Impact	Negative	C	High (B, T)	Moderate (B, T)
	Health	Negative	C	Moderate (B, T)	Low (B, T)
	Tourism	Negative	O	Moderate (B, T)	Low (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
		Positive	O	Moderate + (B, T)	Moderate + (B, T)
	Provision of electricity	Positive	O	High + (B, T)	Very High + (B, T)
	Radiological impact on the public	Negative	O	Low (B, T)	Low (B, T)
	Financial viability of the NPP	Positive	O	Very High + (B, T)	Very High + (B, T)
	Job losses	Negative	D	High (B, T)	Moderate (B, T)
	Reduction in electricity	Negative	D	Very High (B, T)	Low (B, T)
	Infrastructure	Negative	D	High (B, T)	High (B, T)
Heritage	Impacts to the Cultural Landscape	Negative	C, O, D	Very High (B)	High (B)
				High (T)	Moderate (T)
	Impacts to Archaeological and Heritage Resources	Negative	C	Very High (B, T)	Very Low (B, T)
	Impacts to Palaeontological Heritage Resources	Negative	C	Very High (B, T)	Very Low (B, T)
Noise	Noise impact on surrounding sensitive receptors	Negative	C, O, D	Moderate (B)	Low (B)
				Moderate (T)	Moderate (T)
Town Planning	Urban (residential or otherwise) expansion	Negative	C, O	Low (B)	Very Low (B)
				Moderate (T)	Very Low (T)
Visual	Change of the landscape characteristics and key views	Negative	P	Low (B, T)	Low (B, T)
		Negative	C	Moderate (B, T)	Moderate (B, T)

ASPECT	IMPACT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
Health	(visual intrusion) and change to the sense of place	Negative	O	High (B, T)	High (B, T)
		Negative	D	Very Low (B, T)	Very Low (B, T)
	Short-term PM _{2.5} exposure	Negative	O	Low (B, T)	Low (B, T)
	Long-term PM _{2.5} exposure	Negative	O	Low (B, T)	Low (B, T)
Climate Change	Increasing temperatures and long-term heat exposure	Negative	O	Moderate (B, T)	Not assessed at Scoping stage
	Water stress and drought affecting water availability	Negative	C, O	High (B, T)	Not assessed at Scoping stage
	Extreme rainfall and surface runoff	Negative	C, O	Low (B, T)	Not assessed at Scoping stage
	Wildfire risk	Negative	C, O	Low (B)	Not assessed at Scoping stage
				Moderate (T)	Not assessed at Scoping stage
	Coastal processes	Negative	O	High (B, T)	Not assessed at Scoping stage
	Climate-related disruption to interdependent infrastructure	Negative	C, O	High (B, T)	Not assessed at Scoping stage
Radiological	Public exposure to radionuclides	Negative	O	Low (B, T)	Low (B, T)
	Non-human biota exposure to radionuclides	Negative	O	Low (B, T)	Low (B, T)
Radioactive Waste and Transport	Radioactive Waste and Transport	Negative	O, D	High (B, T)	Moderate (B, T)
Traffic	The traffic impact assessment can only be undertaken in the EIA phase.				

Table 10-29 – Initial Cumulative Impacts

ASPECT	NATURE	PHASE	SIGNIFICANCE (BEFORE MITIGATION)	SIGNIFICANCE (AFTER MITIGATION)
Air Quality	Negative	C, O	Low (B)	Very Low (B)
			Very High (T)	Very High (T)
Surface Water	Negative	C, O	Moderate (B, T)	Low (B, T)
Fauna and Invertebrates	Negative	C, O	Very High (B, T)	Very High (B, T)
Terrestrial			Moderate (B, T)	Moderate (B, T)
Aquatic Ecosystems	Negative	C, O	Moderate (B, T)	Low (B, T)
Marine	Negative	C, O	Low (B, T)	Low (B, T)
Visual	Negative	C, O	Moderate (B, T)	Low (B, T)
Climate Change	Negative	C, O	Moderate (B, T)	Low (B, T)
Traffic	Negative	C, O	Moderate (B, T)	Low (B, T)

11 PLAN OF STUDY FOR THE EIA

11.1 TERMS OF REFERENCE

Table 11-1 outlines the structure of the plan of study as required in terms of Appendix 2 of GNR 982.

Table 11-1 – Plan of Study Requirements

Plan of Study Chapter	Information Requirements as per GNR 982
Description of EIA Tasks	A description of the tasks that will be undertaken as part of the environmental impact assessment process.
Description of Alternatives	A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.
Aspects to be Assessed in the EIA Process	A description of the aspects to be assessed as part of the environmental impact assessment report process.
Specialist Studies	Aspects to be assessed by specialists.
Impact Assessment Methodology	- A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists. - A description of the proposed method of assessing duration and significance.
Environmental Impact Report	Contents of EIAR as specified in GNR 982 (as amended) Annexure 2.
Stakeholder and Authority Engagement	- An indication of the stages at which the competent authority will be consulted. - Particulars of the public participation process that will be conducted during the environmental impact assessment process.

11.2 OVERVIEW OF THE EIA PHASE TASKS

The EIA phase will consist of the following tasks; each of these tasks is detailed separately in the following sub-sections:

- Specialist studies;
- Continuation of authority and stakeholder engagement;
- Assessment of the significance of potential impacts; and
- Preparation of the EIA Report.

11.3 SPECIALIST SCOPING PHASE CONCLUSIONS

11.3.1 AIR QUALITY

Based on the High-level impact assessment and significance rating, both Thyspunt and Bantamsklip site are suitable for the development of a NPP from an air quality perspective.

Bantamsklip is further away from AQSRs and have fewer proposed renewable project developments planned in the vicinity, it may be better suited from an air quality perspective. The renewable projects would however only have an impact on air quality during construction, with little to no air pollution deriving from the operational phases (both PV Solar farms and wind farms).

However, due to the low air quality impacts expected from the NPP, and that neither site has fatal flaws or high sensitivity, air quality should not be main determining aspect for site selection.

11.3.2 DUNE GEOMORPHOLOGY

The Thyspunt site has mobile dunes and higher geomorphologic conservation value, so the negative impacts are higher than Bantamsklip. Thus, Bantamsklip is the preferred site in terms of dune morphology.

11.3.3 GEOHYDROLOGY

The following preliminary conclusions are drawn for both sites from a geohydrology perspective:

- The sites are coastal and the nuclear footprint/island is located near the end of the groundwater flow path, with no downstream groundwater users;
- The receiving environment/downstream receptor of any direct contamination will be the shore zone/sea;
- There is a dual aquifer system at each site comprising an upper unconfined intergranular aquifer and a lower semi-confined fractured rock aquifer. These aquifers are likely to be in hydraulic connection, with an upward component of flow in the fractured rock aquifer;
- The aquifer system at Thyspunt can support groundwater abstraction for site establishment purposes;
- There are municipal and other groundwater supply schemes in proximity to both sites. Leaks of radioactivity would not affect such users directly. However, air emissions could be transported inland by prevailing winds and contaminate such groundwater by being incorporated into rainfall recharge;
- Impacts of the project on the environment will be limited to the sites themselves during construction and operation, barring possible air emissions of radioactivity; and
- Site sensitivity for the areas that will be impacted by the NPP is Medium for Thyspunt and Low for Bantamsklip.

In conclusion, geohydrological considerations should not be a constraint on the development of either of the sites for a NPP.

11.3.4 FRESHWATER SUPPLY

The main conclusions regarding freshwater supply to a NPP at the Thyspunt and Bantamsklip sites are as follows:

- Provisional potable water requirements vary between 70.72 L/s during site establishment, 94.94 L/s for construction and 30.39 L/s during normal operation of the NPP. An additional 49.96 L/s of demineralised water is also required for e.g. boiler and turbine feed water. This is for reactor units to supply an initial 5 200 MWe electrical power.
- Assuming a 40% recovery of potable water means that total abstraction from the water source will be 176.8 L/s, 205.00 to 237.35 L/s and 75.97 L/s for the above phases, plus a presumably lower recovery rate for demineralised water.
- These freshwater requirements cannot be sourced or guaranteed from existing conventional water supply schemes or from groundwater resources at and around the sites.
- Securing a reliable fresh water supply from other sources such as new schemes, re-use of wastewater, site storm water run-off and/or water trading is not considered to be viable due to existing and future demand and the risk of future water deficits due to droughts.

- Desalination of seawater offers the best short- and long-term option for fresh water supply to support the safe operation of the NPP with least environmental impact and highest assurance of supply and is therefore the preferred option.
 - Maximum brine production will be 142.41 L/s during peak construction and 45.58 L/s during operation.
 - The potable water-derived brine will have a Total Dissolved Solids (TDS) concentration of c.76 000 mg/L and will be mixed with the cooling water effluent during NPP operation, giving a total discharge TDS of c.45 532 mg/L. Demineralised water will presumably be obtained from desalinated seawater with a lower recovery rate than for potable water.
 - Desalination plants will be established in phases with several water treatment plants with permanent reservoirs established for the construction and operational phases.
 - Desalination plants, reservoirs and intake/discharge structures will all be established within the EIA Corridor area.
 - With desalination of seawater being the preferred option there are no uncertainties associated with construction peak and operational fresh water supply, as long as the quality of the intake water and membranes are monitored and adequately maintained.
 - Maximum brine production will be 142.41 L/s during peak construction and 45.58 L/s during operation.
 - The potable water-derived brine will have a Total Dissolved Solids (TDS) concentration of c.76 000 mg/L and will be mixed with the cooling water effluent during NPP operation, giving a total discharge TDS of c.45 532 mg/L. Demineralised water will presumably be obtained from desalinated seawater with a lower recovery rate than for potable water.
 - Desalination plants will be established in phases with several water treatment plants with permanent reservoirs established for the construction and operational phases.
 - Desalination plants, reservoirs and intake/discharge structures will all be established within the EIA Corridor area.
 - With desalination of seawater being the preferred option there are no uncertainties associated with construction peak and operational fresh water supply, as long as the quality of the intake water and membranes are monitored and adequately maintained.
- Should conventional freshwater supply sources, either existing or new, ever be considered for freshwater supply, then agreement would need to be reached with the local authorities and the Department of Water and Sanitation to secure the required supply.
- Uncertainties associated with conventional fresh water supply are:
 - effects of drought/climate change on security and availability of supply;
 - long-term regional planning priorities.
- Site sensitivity at both sites is ranked as Very Low with respect to desalination of seawater,
- Impact assessment is High to Very Low at both sites.
- Mitigation measures include:
 - Construction Phase
 - Discharge of brine a suitable distance offshore and compliance with water quality guidelines (to be assessed by Oceanography/Marine Ecology specialists).
 - Operational Phase

- Discharge of brine with the NPP cooling water discharge.

11.3.5 SURFACE WATER

The following conclusions are drawn for the two sites from a surface water perspective:

Thyspunt

- The data used in this assessment was from the 2025 SSR, which considered the impact of the environment on the site selection for the NPP. Climate change was incorporated into the hydrology and hydraulic assessment.
- The site and surrounding catchments are currently all moderately vegetated, with five major vegetation types occurring on the site, viz: Algoa Dune Strandveld, Southern Cape Dune Fynbos, Tsitisikama Sandstone Fynbos, Cape Seashore Vegetation and Cape Lowland Freshwater Wetlands. The catchments have a low runoff coefficient due to high infiltration resulting from the sandy soils and moderate vegetation. Due to the topography and location of the proposed site, the external catchments impacting the site are relatively small (less than 2.0 km²), and the inland water levels are controlled by the backup from the extreme sea water levels.
- Two non-perennial drainage lines are located close to the site: one along the western boundary (Slang) and one along the eastern boundary (Sand). Potential temporary ponding areas have also been identified. These areas are primarily low points with no natural outlet and may accumulate excess runoff during storm events, causing temporary ponding.
- With the implementation of appropriate remedial measures and stormwater management plans, the hazard and vulnerability associated with surface water are assessed to be low. The site is considered suitable for the development of a nuclear installation, subject to confirmation that final platform levels exceed the applicable flood exceedance thresholds (10⁻⁴, 10⁻⁶, and 10⁻⁸ annual probability of exceedance, 95th percentile).
- Surface water impacts are expected to be largely confined to the site footprint and immediate downstream coastal zone, provided mitigation measures are implemented.
- The site sensitivity (2014 EIR) for pre-development areas varies from low to high. During construction and operation without mitigation, sensitivity is high. With the implementation of stormwater management plans and other mitigation measures, it is assessed as low.
- The site-specific significance rating of surface water impacts can be summarised as follows:
 - Increase in runoff resulting in potential flooding due to additional hard surface areas (construction and operational phase): Moderate. With mitigation: Low.
 - Increase in erosion resulting from increase in velocities from additional hard surface areas (construction phase): Moderate. With mitigation: Low.
 - Changes in flow path, resulting in concentrated flows and increased velocities (previously sheet flow) due to infrastructure (construction and operational phase): Moderate. With mitigation: Low.
 - Pollution of surface water resulting from dirty water spills and silt deposition associated with the development of the nuclear plant and associated infrastructure. (construction and operational phase): Moderate. With mitigation: Low.

Bantamsklip

- The data used in this assessment was from the 2014 EIR, which considered the impact from the environment on the NPP and the impact of the NPP on the environment. Climate change was not

incorporated and must be included in updated hydrological and hydraulic modelling if this site is advanced.

- The topography is relatively flat with a gentle slope towards the coast, though dunes occur along the coastline. The part of the site along and to southwest of the R43 is situated on a coastal plain between 25 and 50 m amsl. The topography rises to the northeast to heights of between 150 - 200 m amsl. The coastal strip reveals a wave-cut platform developed on the bedrock, exposed in a narrow rocky belt at the high-tide mark. The coastal belt becomes sandier to the southeast with less rock exposure.
- No major rivers drain the immediate site due to permeable sandy soils. Perennial rivers in the broader study area include Hagelkraal, Koks, Wolfgat and Ratel rivers. The Koks and Wolfgat rivers are tributaries of the Ratel River, flowing southeast towards the coast, away from the nuclear footprint. Most of the smaller coastal stream's infiltrate into sandy areas and do not maintain continuous channels across the narrow-raised dunes.
- Surface water impacts are expected to be largely confined to the site footprint and immediate downstream coastal zone, provided mitigation measures are implemented.
- The site sensitivity (2014 EIR) for pre-development areas varies from low to medium. During construction and operation without mitigation, sensitivity is high; with mitigation measures including stormwater management plans, sensitivity is Low.
- The site-specific significance rating of surface water impacts can be summarised as follows:
 - Increase in runoff resulting in potential flooding due to additional hard surface areas (construction and operational phase): Moderate. With mitigation: Low.
 - Increase in erosion resulting from increase in velocities from additional hard surface areas (construction phase): Moderate. With mitigation: Low.
 - Changes in flow path, resulting in concentrated flows and increased velocities (previously sheet flow) due to infrastructure (construction and operational phase): Moderate. With mitigation: Low.
 - Pollution of surface water resulting from dirty water spills and silt deposition associated with the development of the nuclear plant and associated infrastructure. (construction and operational phase): Moderate. With mitigation: Low.

In conclusion, provided that the recommended remedial measures and stormwater management plans are implemented and maintained, the surface water impacts at both sites are assessed to be of low significance. From a surface water perspective, both sites are considered suitable for development, subject to confirmation of final platform levels above the applicable flood exceedance thresholds and, for Bantamsklip, the incorporation of climate change into updated hydrological and hydraulic modelling, if the site is advanced.

11.3.6 MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE

From a marine physical, water quality, sediment transport and shoreline change perspective, the summary of site suitability is provided in Table 11-2 below.

Table 11-2 – Summary of Site Suitability Assessment

Nature of Impacts	Preferred Site	Reason
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Excavations, Dredging and Material Disposal Activities	Thyspunt site	Lower disposal volumes, closer proximity of deeper waters, more extensive and less fragmented areas for disposal, the opportunity to use material to nourish the St Francis beaches
Sediment transport and Shoreline Change	No preference for tunnel intakes and discharges	Should tunnel intakes and discharges be considered there will be little, if any disruption of nearshore transports that could lead to shoreline change.
	Bantamsklip should stilling basins be considered	The increased sediments transport rates at Thyspunt are likely to result in slightly greater and longer-term impacts should stilling basins be considered
Impacts of the intake and discharge of cooling water and desalination effluents.	Thyspunt site	Thermal and brine impacts are generally larger and more significant when discharges occur at the coast of in shallow nearshore waters. The bathymetry at Thyspunt is more suited to shorter tunnels whether for intake or discharge of both cooling and desalination brines, resulting in Thyspunt being the preferred site
Tsunami's, storm surge and sea level changes	Bantamsklip site but risks can be mitigated through appropriate design making the risk similar at both sites	For the worst-case tsunami event coinciding with extreme meteorological conditions (95% exceedance), it is predicted by that water levels would reach +11.03 m and +14.77 m MSL at Bantamsklip and Thyspunt, respectively. This suggests a preference for the Bantamsklip site
Accidental Spills	No preference	Given the present status of identification and assessment of potential spills, there is no clear preference between the Bantamsklip and Thyspunt Sites

Given that the impacts of the cooling water discharges and disposal of material at sea are the most significant, this would suggest an overall preference for the Thyspunt site.

Once mitigation measures have been deployed, the key potential impacts are those associated with:

- The discharge of cooling waters, the impacts being most significant for stilling basin intakes and channel discharges at the shoreline.
- The disposal of excavation material and other dredge material, the impacts being most significant for discharges occurring in shallower inshore waters compared to disposal in deeper water further offshore.
- Potential shoreline change impacts due to the potential disruption of sediment transport in the nearshore. However, this is largely confined to the Thyspunt site. However, the quantities of material available for beach nourishment could be used to mitigate such effects.

11.3.7 AGRICULTURE

The overall conclusion of this assessment is that the proposed development on the Bantamsklip or the Thyspunt coastal site is acceptable because it leads to negligible loss of future agricultural production potential. On the Thyspunt inland site, it will cause a very small reduction in future agricultural production potential and will result in a small loss of agricultural production land.

The cropping potential of the Bantamsklip and the Thyspunt coastal sites is limited by the combination of climate, terrain, and soil constraints. Because of these constraints, the sites are completely unsuitable for viable rainfed crop production. The sites and immediate surrounds have never been used for cropping. On the Thyspunt inland site, the land is suitable for and is used for cultivation of kikuyu pastures.

The screening tool classifies the sites as ranging from low to very high agricultural sensitivity. This assessment disputes the high and very high sensitivity classification of the Bantamsklip and the Thyspunt coastal sites by the screening tool and verifies the entire Bantamsklip site as being of low agricultural sensitivity and the entire Thyspunt coastal site as being of medium agricultural sensitivity because of their assessed cropping potential. Because the Thyspunt inland site is suitable and utilised for pivot irrigated pastures, its sensitivity is very high. This assessment therefore confirms the very high sensitivity classification of that site by the screening tool.

An agricultural impact is a change to the future agricultural production potential of land. This is primarily caused by the exclusion of agriculture from the footprint of the development. The entire Bantamsklip site and the Thyspunt coastal site are considered to be below the threshold for needing to be conserved as agricultural production land because of the limitations that make them totally unsuitable as viable cropland. The proposed development on this land will therefore result in negligible loss of future agricultural production potential. The overall negative agricultural impact of the development on these sites is therefore assessed as being of very low significance and as acceptable. In the case of the inland Thyspunt site, the entire site is considered to be above the threshold for needing to be conserved as agricultural production land because of its suitability for irrigated pastureland. The proposed development will result in the permanent loss of less than 36 hectares of this land to agriculture, which will result in a small loss of future agricultural production potential in terms of national food security. The impact is assessed as being of low significance. Because the Thyspunt site results in some loss of agricultural production land, the Bantamsklip site is the preferred one in terms of agricultural impact. However, the difference is very minor and is not considered significant for the choice of site. Both sites are acceptable in terms of agricultural impact.

11.3.8 GEOTECHNICAL

The completed scoping assessment of the geological, geotechnical and seismic conditions at two proposed NPP sites, Thyspunt and Bantamsklip, has shown that both sites are generally suitable for the proposed development.

A “Negative Low to Negative Very High” impact significance range pre-mitigation was assessed. Post-mitigation, the assessed impact significance decreases to “Negative Very Low to Negative Medium”.

11.3.9 FAUNA AND INVERTEBRATES

This animal theme scoping assessment indicates that both Bantamsklip and Thyspunt support ecologically important faunal habitat within largely natural coastal landscapes, and that both PAOIs contain receptors that are sensitive to large-footprint, long-duration infrastructure such as a NPP and its associated roads, servitudes, yard infrastructure and security footprint. Across both sites, the receiving environment includes threatened/under-protected ecosystem types, CBA features, KBA context and/or proximity to conservation areas, meaning that the project will need to be taken forward on the basis of a strict mitigation hierarchy with strong emphasis on avoidance and footprint discipline, followed by minimisation, rehabilitation/restoration, and offsets where residual impacts remain.

Overall sensitivity and key receptors

Vertebrates (mammals + herpetofauna)

Field surveys recorded mostly common amphibian, reptile and mammal species, which is not unexpected for short-duration surveys in dense coastal vegetation and dune systems; however, desktop and literature context indicate that SCC and range-restricted taxa may occur or move through both PAOIs, and that habitat integrity and connectivity are the primary drivers of vertebrate conservation value at this stage.

At Bantamsklip, the vertebrate baseline indicates sensitivity linked to intact coastal fynbos/strandveld structure and connectivity, with potential SCC presence (e.g., *Bitis armata* predicted as a plausible SCC) and a strong landscape-level conservation context.

At Thyspunt, the vertebrate baseline is strongly influenced by wetlands/water resources and the associated habitat mosaic (dune slacks/seeps and wetland-linked corridors), and the confirmed presence of wetland-associated mammals (e.g., *Cape Clawless Otter*) elevates the importance of maintaining wetland buffers, hydrological integrity and disturbance controls as well as the Cape Seashore vegetation.

Implication: For vertebrates, the project risk is about permanent habitat conversion, barrier effects (roads/fencing), and the cumulative disturbance footprint (noise, night traffic and lighting) that can displace sensitive species and reduce functional connectivity over the project lifetime.

Invertebrates

Both sites support invertebrate fauna of conservation relevance; however, the assessment indicates that Bantamsklip currently presents the stronger constraint from an invertebrate sensitivity perspective, due to the confirmed presence of a listed SCC (*Brinckiella aptera*) and the detection of multiple taxa that are likely undescribed and therefore potentially of high conservation significance once taxonomic status and distributions are clarified.

Thyspunt supports conservation-relevant invertebrates (including taxonomically distinctive/rare taxa), but several key records still require status confirmation (e.g., whether certain records represent undescribed taxa versus range extensions), which directly affects sensitivity classification and the residual-impact/offset calculus.

Implication: Invertebrate sensitivity at both sites is driven by (i) fine-scale habitat attributes (soil/microhabitat structure and vegetation composition), (ii) high sensitivity to disturbance and fragmentation, and (iii) the very limited feasibility of restoring pre-impact invertebrate assemblages once habitat is transformed. Determination of a preferred site for construction of the NPP from an invertebrate perspective would require clarification of the status of the undescribed species present, as well as consideration of the potential positive impacts that might result from protection and conservation of a significant area of habitat surrounding the NPP within a development exclusion zone.

Integrated conclusion for decision-making

From an animal theme perspective, neither site can be considered low sensitivity, and both will require strong avoidance-led planning and stringent operational controls to prevent unacceptable long-term impacts. The most significant unavoidable effect at either site is permanent habitat loss, with fragmentation and chronic disturbance posing the principal risks to broader ecosystem

functioning and faunal persistence in adjacent habitats. The assessment further indicates that Bantamsklip currently presents comparatively higher invertebrate constraint, while Thyspunt's key sensitivities are strongly tied to wetland/water-resource receptors and associated faunal use, particularly where hydrological integrity and disturbance buffers are challenged. Final site preference and impact acceptability should therefore be determined only after (i) layout refinement against SEI mapping, (ii) resolution of key invertebrate uncertainties, and (iii) confirmation that lighting, connectivity and invasive-species controls can be implemented and enforced over the full project lifecycle.

11.3.10 FLORA

Desktop information, field data collection and mapping from aerial imagery provides the following verifications of patterns for the Terrestrial Plant Species Theme:

Bantamsklip:

- The site was flagged as having "Medium" sensitivity with respect to the Terrestrial Plant Species Theme.
- The site inspection and desktop research confirms this Medium sensitivity within the proposed development footprint area due to the suspected occurrence of SCC (suspected habitat for SCC listed as as Critically Endangered, Endangered or Vulnerable).
- Inland areas have High sensitivity but fall outside the proposed project footprint area and are unlikely to be directly affected by the proposed project.
- The proposed development is likely to have impacts of Moderate to Low significance on Terrestrial Plant SCC.
- One protected tree species (*Sideroxylon inerme*) occurs in the study area and may require a permit for removal.

Thyspunt:

- The site was flagged as having "Medium" sensitivity with respect to the Terrestrial Plant Species Theme.
- The site inspection and desktop research disputes this Medium sensitivity and proposed High sensitivity within the proposed development footprint area due to the confirmed occurrence of SCC (confirmed habitat for 10 SCC and suspected habitat for 4 SCC listed as as Critically Endangered, Endangered or Vulnerable).
- The proposed development is likely to have impacts of High to Medium significance on Terrestrial Plant SCC.
- One protected tree species (*Sideroxylon inerme*) occurs in relatively high numbers in the study area and will require a permit for removal.

From a terrestrial plant species risk perspective, Bantamsklip would represent the lower ecological risk option for progression into the Nuclear EIA phase, for the following reasons:

- Bantamsklip has Medium theme sensitivity (suspected habitat for one SCC) and a preliminary impact assessment assesses an impact of Medium / Low significance on SCC.
- In contrast, Thyspunt has a High theme sensitivity (confirmed habitat for ten SCC and suspected habitat for four more species) and a preliminary impact assessment assesses an impact of High / Medium significance on SCC.

11.3.11 TERRESTRIAL BIODIVERSITY

Desktop information, field data collection and mapping from aerial imagery provides the following verifications of patterns for two sites:

11.3.11.1 Bantamsklip

- Two listed threatened vegetation types.
- Two-thirds protected area, one third CBA1.
- Less local habitat diversity.

11.3.11.2 Thyspunt

- Equal parts CBA1, CBA2 and ESA1.
- High local habitat diversity and ecologically connected systems.

From a terrestrial biodiversity risk perspective, Thyspunt would represent the lower regional ecosystem risk option for progression into the EIA phase but has higher local ecosystem sensitivity and diversity.

11.3.12 AQUATIC ECOSYSTEMS

This is a complex question from the perspective of impacts on aquatic ecosystems.

From the perspective of the development posing the lowest level of negative risk to aquatic ecosystems, the Bantamsklip site clearly is the least problematic development site, and could probably (pending further design details) be constructed with minimal direct impact on aquatic ecosystems. It would moreover also allow for extended conservation of important wetlands in the area north of the development platform.

Development of the Thyspunt site would, by contrast, involve development with a high likelihood of impacting at least some of the coastal wetlands, and infrastructure such as roads and transmission lines and their support structures would probably all cross through complex, dynamic and highly sensitive dunefields, potentially impacting on the condition and/or function of the important duneslack wetlands and their terrestrial surroundings. Impact mitigation would be more complex than at Bantamsklip and implementation would require stringent adherence to no-go areas and other mitigation requirements. The ability of Eskom to adhere to these in a transparent and reliable manner is uncertain,

Nevertheless, the project, if authorised, at Thyspunt could also bring with it extensive conservation opportunities for areas that are currently degrading as a result of multiple, relatively small impacts and activities, which nevertheless have a significant cumulative impact. These include dune mining, extensive wind turbine development on the dune edges, alien invasion and excavation and (legal) dumping along the eastern end of the dunefield, just west of the Cape St Francis access road. An NPP development at the Thyspunt site could secure the Oyster Bay dunefields as well as the important wetlands to the south, between the dune field and the development platform. During the 2025 site visit, it was evident that alien plant removal has been extensive on the Eskom-owned portions of the site since 2013, although alien plant invasion remains one of the most pressing current ecological issues in that area.

From this perspective, there is an argument that Thyspunt could provide better conservation opportunities than Bantamsklip and is thus a preferred site – but this comment is heavily caveated with the caution that this would require stringent attention to mitigation requirements, once

formulated; upfront commitment to conservation activities from Eskom; and ring-fencing of management funds for conservation areas.

No-go areas for development

No-go areas for development on either site comprise all watercourses and their stipulated buffer areas. No-go activities would be any that could result in draw-down or other impacts to these watercourses – in the case of the Thyspunt site, it is recognised that the proposed NPP would indeed result in impacts to some of the coastal seeps and such impacts would require ecological compensation / offsetting.

For the Bantamsklip site, no-go areas would include the site north of the R43.

Additional recommendations

The need for formal wetland offsets versus the capacity of Eskom to secure onsite compensation through expansion of land ownership must be explored in the EIA phase of this project.

11.3.13 MARINE ECOLOGY

Key areas of sensitivity

The Thyspunt site is characterised by a largely undisturbed coastal environment, particularly within the eastern embayment, which retains natural habitat conditions. Field observations confirmed no visible signs of human activity along the shoreline, there was no litter, vehicle tracks, or evidence of harvesting. The nearshore habitat consists predominantly of dynamic sandy beaches, classified as Agulhas Intermediate Sandy Shore, which are considered of Least Concern nationally, with small patches of Agulhas Stromatolite Mixed Shore, a Vulnerable habitat type with a restricted national extent of just 8.45 km². While these areas are not designated Critical Habitat under IFC criteria, the eastern CBA Natural zone represents sensitive habitat where activities such as seawater abstraction or disposal are restricted and require careful, site-specific assessment. Overall, the site supports natural processes and habitats that are largely intact, and development should be focused on avoiding direct disturbance to these sensitive areas, prioritising construction within less sensitive sandy shore zones. Monitoring data from similar nearby sites, such as the Koeberg NPP area, indicates that these habitats are resilient to well-managed human activities, provided strict mitigation measures are applied.

Bantamsklip presents a site with clear evidence of ongoing human pressures along the coastal zone. Vehicular tracks were widespread across beaches and foredunes, indicating frequent access by recreational fishers, poachers, and kelp harvesters, which has led to localised erosion and degradation of dune vegetation. Illegal harvesting of invertebrates was prominent, with piles of discarded abalone shells, crayfish tails, and turbo shells observed, confirming active exploitation in the area. Kelp harvesting, particularly of *Ecklonia maxima*, was evident along the northern beach, with piles of drift kelp left to dry on the fynbos fringe, smothering underlying vegetation and potentially disrupting the local invertebrate communities dependent on this material. Offshore habitats include Vulnerable kelp forests, while to the south, Agulhas Reflective Sandy Shore habitats are classified as Endangered; these habitats are sensitive to direct disturbance, though they were not physically assessed during the site visit. Despite these pressures, the site is not considered Critical Habitat, and the natural processes are largely functional, albeit modified. Mitigation measures and management controls will be essential to limit further habitat degradation and guide development to the least sensitive areas, avoiding the most impacted dunes, nearshore kelp zones, and any patches of sensitive offshore habitats.

Based on the site level assessments, coastal areas have been demarcated as preferred and conditional areas based on their sensitivities to development. If development cannot be located within preferred areas, and is to occur within conditional areas, every effort should be made to avoid direct disturbance to these habitats.

Impact assessment

High level negative impacts assessed as of moderate, High or Very High significance prior to mitigation relate to loss of habitat, smothering and turbidity impacts related to disposal of sediment, above water and below water noise, discharge of undiluted brine during construction and large volumes of cooling water during operations, and the exclusion of fisheries from current areas of operation for the lifespan of the plant (80-years). Impacts of particular concern are outlined below.

- The loss of subtidal and intertidal habitat is unavoidable for the proposed project activities at both Thyspunt and Bantamsklip. While the intertidal and subtidal habitats of both sites are considered typical of the South Cape coast and are not considered of particular sensitivity or ecological significance, the placement of this infrastructure within CBA Natural habitat or within delineated Vulnerable/Endangered habitats results in a High significance rating. Mitigation would include placing infrastructure outside of these CBA or Vulnerable habitats.
- The potential impacts that the offshore disposal of excavated sediment may have on the chokka squid fishery at Thyspunt during the construction phase is rated as of Very High significance prior to mitigation. Disposal of this sediment at sea will lead to an increase in turbidity, sediment plumes, and smothering of spawning substrates related to disposal of excavated sediment offshore. Mitigation can reduce this impact to Moderate significance; however, it is strongly recommended that alternative uses of this excavated sediment be found to minimise the need for disposal at sea.
- Above water noise impacts during construction at Bantamsklip are considered to be of High significance prior to migration. This is due to the relatively close proximity of the Dyer Island seabird colonies (in particular, the colonies of Critically Endangered African Penguin). A noise modelling assessment should be undertaken to quantify the area of impact and should be used to inform mitigation measures.
- Thermal impacts are of particular concern for once-through cooling ($\Delta T = 12^{\circ}\text{C}$) at both Thyspunt and Bantamsklip. A design of this nature is not strictly accommodated within the existing guideline framework for discharge of effluent from land-based sources into the coastal environment (DEA 2014) and would therefore require motivation under the “exceptional circumstances” clause included in these guidelines.
- The establishment of marine exclusion zones around the proposed NPP site at Thyspunt is expected to result in localized impacts on the commercial chokka squid fishery in South Africa due to the loss of access to fishing grounds that are intensively used close to shore. This impact is assessed as of Moderate significance, and no practical mitigation is available to reduce this significance.

It is noted that the implementation of operational exclusion zone will have a positive impact on biodiversity as a de facto protected area that can be incorporated as an OECM to South Africa’s South Africa’s 30x30 target as per the Kunming–Montreal Global Biodiversity Framework. The impact is rated as of High positive significance for both Thyspunt and Bantamsklip sites.

Site suitability

Based on this Marine Ecology Scoping Report, Thyspunt is assessed as the preferred site for the proposed NPP from a marine ecological and fisheries perspective. This conclusion is grounded in the relative sensitivity of coastal and marine habitats, the extent of existing human pressures, the overlap with priority conservation features, and the scale and manageability of potential impacts.

Unlike Bantamsklip, Thyspunt is not located within an EBSA, avoiding regional conservation sensitivities (and therefore the sensitive EBSA components, e.g., high level predator hotspot). It should be noted that its' coastline is largely intact and undisturbed, with areas of Vulnerable habitat, but significant impacts can be avoided through careful placement of associated infrastructure within the identified Preferred location. Bantamsklip also has an Endangered habitat type present.

Although Thyspunt overlaps with the key commercial chokka squid spawning grounds, this impact is manageable. The primary risk, turbidity and smothering from sediment disposal, can be reduced to low or moderate significance by avoiding offshore sediment dumping or, if unavoidable, ensuring disposal occurs outside the spawning season and is guided by hydrodynamic modelling. No other significant fisheries conflicts at Thyspunt pose high or unmitigable impacts, whereas Bantamsklip overlaps multiple sensitive fisheries, including linefish, small pelagics, kelp harvesting, and proximity to a commercial abalone farm that relies on clean, stable seawater.

Furthermore, Bantamsklip, although showed evidence of significant human-use (albeit largely illegal or exacerbated by malpractice) this site is close to the Dyer Island seabird colonies, which support Critically Endangered African penguins and other IUCN listed species. These factors combine to make Bantamsklip less suitable from a marine ecology and fisheries perspective, with impacts more complex to manage and mitigate.

11.3.14 AVIFAUNA

Field surveys were conducted at Bantamsklip from 4–6 December 2025 and at Thyspunt from 12–16 January 2026, covering the dry season at both sites. Standardized point counts, vantage point surveys, drive transects, nest surveys, and incidental observations were employed to ensure comprehensive coverage of the PAOI and its key habitats.

Across both sites, a total of 228 avifaunal species (Bantamsklip) and 364 avifaunal species (Thyspunt) are expected based on SABAP2, CWAC, and CAR data, with 45 and 71 Species of Conservation Concern (SCC), respectively. During the field surveys, 11 SCCs were recorded at Bantamsklip and 12 SCCs at Thyspunt, including regionally and globally threatened species such as the African Marsh Harrier (*Circus ranivorus*), Black Harrier (*Circus maurus*), Blue Crane (*Anthropoides paradiseus*), Cape Cormorant (*Phalacrocorax capensis*), Denham's Bustard (*Neotis denhami*), and Fynbos Buttonquail (*Turnix hottentottus*). Several risk species prone to collision, electrocution, or habitat loss were also observed.

Habitat assessments identified a mosaic of habitat types at both sites, including fynbos, strandveld, disturbed and transformed areas, pasture fields, seashore vegetation, and water resources such as wetlands and coastal systems. These habitats support a diverse avifaunal assemblage and provide critical breeding, foraging, and migratory stopover sites for SCCs and other priority species. Notably, sensitive features such as wetlands, rocky shorelines, and breeding colonies were mapped and assessed for their ecological importance and resilience.

The impact assessment identified a range of potential risks to avifauna associated with the construction, operation, and decommissioning of the proposed NPP. These include direct habitat loss, disturbance and displacement, direct mortality (including from construction activities and vehicle collisions), thermal and chemical pollution of water bodies, radiological contamination (in the event of accidental release), and cumulative impacts from large-scale infrastructure and exclusion zones.

It is the opinion of the specialist that, provided the full suite of mitigation and management actions recommended in this report are implemented, the development of the NPP at either Bantamsklip or Thyspunt can be considered from an avifaunal perspective. The impacts were assessed collectively for both sites due to their comparable sensitivity, and as such, neither site is considered more or less favourable in terms of avifaunal risk.

11.3.15 SOCIO-ECONOMIC

The Socio-Economic Impact Assessment for the scoping phase evaluated the potential social and economic implications associated with the proposed NPP at the alternative sites of Thyspunt (Eastern Cape) and Bantamsklip (Western Cape). The assessment considered baseline socio-economic conditions, stakeholder inputs, and anticipated impacts across the project's construction, operational, and decommissioning phases.

The assessment found that both sites would experience significant social change, particularly during the construction phase, driven by employment creation, migration of construction workers and jobseekers, and increased demand for services. However, the nature, intensity, and mitigation of these impacts differ between the two sites.

Key findings include that Thyspunt is located within a district and local municipal area characterised by higher unemployment, higher poverty levels, and greater development needs than Bantamsklip. As a result, the relative socio-economic benefits of employment creation and local procurement are expected to be more significant at Thyspunt.

Construction and operation of the project at Thyspunt are expected to provide meaningful employment opportunities and economic stimulation in an area with limited prospects for large-scale development. These benefits are likely to have a stronger positive effect on household livelihoods and local economic activity than at Bantamsklip, where the economy is more diversified and less dependent on a single large employer.

Bantamsklip is located within a sensitive coastal environment strongly linked to tourism, lifestyle-based economies, and conservation. Social perceptions of risk associated with nuclear development are more likely to affect tourism-related livelihoods at Bantamsklip than at Thyspunt, where the surrounding land use is predominantly agricultural and less dependent on tourism.

While both sites would experience pressure on housing, health services, and social infrastructure during construction, existing settlement patterns and service capacity in the Thyspunt area are better suited to incremental expansion and managed accommodation solutions than the more spatially constrained Bantamsklip area.

Issues raised during the initial stakeholder engagement indicate stronger, more persistent concerns at Bantamsklip regarding impacts on tourism, property values, and sense of place. At Thyspunt, stakeholder concerns were more focused on employment access, service provision, and impact

management, which are considered more amenable to mitigation through planning and management measures.

Although vulnerable groups are present at both sites, the project's potential to contribute to socio-economic upliftment through targeted employment, skills development, and local procurement is greater at Thyspunt, provided that mitigation measures are effectively implemented.

From a social perspective, Thyspunt is identified as the preferred site due to the balance of impacts and benefits and the greater potential for positive socio-economic outcomes. The justification for this preference is based on the following considerations:

The project's positive social impacts, particularly employment creation and economic stimulation, are expected to be more meaningful and transformative in the Thyspunt area, given the area's existing development challenges.

Potential negative social impacts at Thyspunt, such as migration pressures, service demand, and community health and safety risks, are considered manageable through appropriate mitigation and integration into the Environmental Management Programme.

Bantamsklip poses a higher risk of social conflict and livelihood disruption, particularly regarding tourism-based activities and community perceptions, which may lead to longer-term socio-economic impacts that are more difficult to mitigate.

The Thyspunt site offers a more suitable social environment for accommodating a large, long-term infrastructure project with fewer risks to existing economic systems and community identity.

In conclusion, the Social Impact Assessment finds that while both alternative sites would experience social impacts, Thyspunt offers a more favourable social context for the proposed development. The anticipated benefits outweigh the potential negative impacts, provided that mitigation measures, stakeholder engagement, and social management commitments are implemented effectively.

The SIA therefore supports the selection of Thyspunt as the preferred site from a social perspective and recommends that the identified mitigation and enhancement measures be incorporated into the Environmental Management Programme to ensure sustainable and responsible project implementation.

The macroeconomic and fiscal assessment demonstrates that the proposed NPP represents a strategically significant investment with substantial long-term benefits at local, regional, and national levels. Consistent with the objectives of the scoping phase, the assessment does not provide definitive cost or benefit estimates but instead establishes the broader economic context of the project, identifies material economic risks and opportunities, and informs the focus of subsequent detailed studies to be undertaken during the EIA phase.

Across its lifecycle, the project is expected to generate strong positive economic impacts, particularly during the construction and operational phases. The construction phase will deliver a substantial stimulus to economic activity through large-scale capital investment, extensive job creation, and increased demand across multiple sectors, resulting in a strong positive contribution to Gross Domestic Product (GDP), employment, and household income. During the operational phase, the project will continue to generate sustained economic value through a reliable baseload electricity supply, strong forward supply chain linkages, and enhanced productivity across the regional, provincial, and national economies. Although the decommissioning phase is expected to result in

declining economic activity and employment, this phase is time-bound. It occurs after an extended operational lifespan during which significant economic and fiscal benefits are realised.

From a financial perspective, both the Thyspunt and Bantamsklip sites are expected to demonstrate strong long-term financial viability. The assessment indicates no material difference in overall cost-effectiveness between the two sites, with both achieving very high positive significance ratings across magnitude, consequence, and likelihood. However, Thyspunt is marginally favoured from an economic efficiency perspective. This advantage is primarily attributable to comparatively more favourable infrastructure availability, improved logistics access, and greater labour market efficiencies, which collectively are expected to reduce implementation risk and enhance cost-efficiency over the full project lifecycle.

The macroeconomic assessment further confirms that the project will generate meaningful direct, indirect, and induced economic impacts. These include significant contributions to GDP growth, capital formation, and income generation, with particularly strong benefits accruing to low- and middle-income households during the construction phase and to highly skilled households during the operational phase. While the project is capital-intensive and therefore exhibits relatively low labour-to-capital ratios during operation, this characteristic is consistent with international experience for nuclear power generation and does not detract from the project's broader economic contribution.

The balance of payments impact is expected to be slightly negative during the construction phase due to the importation of specialised equipment. Still, these impacts are anticipated to be mitigated over time through localisation initiatives. During the operational phase, the project is expected to positively affect the balance of payments by enhancing domestic production capacity and increasing exports of value-added goods and services. Fiscal impacts are similarly phased, with initial financing pressures during construction offset over the long term by increased tax revenues and economic activity during operation.

In conclusion, the macroeconomic and fiscal assessment confirms that the proposed Nuclear Power Plant is economically justified and aligned with South Africa's long-term energy security, industrialisation, and development objectives. While both sites are economically viable, Thyspunt is the preferred site from an economic perspective, owing to its cost-efficiency advantages, infrastructure readiness, and reduced implementation risk. These factors position Thyspunt as the more economically robust option for maximising macroeconomic benefits and supporting efficient project delivery as the project advances into the EIA phase.

11.3.16 HERITAGE

The review of the two sites proposed for the Nuclear Power Plant (NPP) at Bantamsklip and Thyspunt benefited from the enormous work that went into several studies commissioned by Eskom around 2010-2012. The Heritage Impact Assessment by Hart (2012) thoroughly investigated the archaeology, built environment and palaeontological resources present within the sites and extensive public engagement took place with affected and interested parties. The study also took the impacts on the cultural landscape and sense of place into account but this sub-discipline within heritage management has progressed significantly since 2012 and a new cultural landscape study was commissioned. At the time, three sites were proposed for investigation and the site at Duynfontyn north of Cape Town was subsequently approved. The remaining two sites have been considered in this report and both sites were found to be highly significant and worthy of at least Grade IIIA protection (local, high significance) in particular areas within the study sites. Thyspunt

has emerged as the slightly less sensitive site from a heritage perspective, albeit with significant caveats.

The archaeological investigations at both study sites have concluded that both areas contain highly significant shell middens, fish traps and shipwrecks. These sites are limited to a narrow coastal band of up to 500m from the high-water mark with Thyspunt holding further archaeological sites on the open dunes about 1.2km further inland of the coast. Archaeologically, there is little to separate the two sites from each other and a Grade IIIA coastal buffer has been recommended at both project sites. An additional Grade IIIB inland dune buffer has also been recommended at Thyspunt. Hart additionally conducted a widespread test excavation programme in the mid-area between the sensitive coastal strip and the open dunefield which found that very little archaeological material is present between 500m to 1.2km from the shoreline. At Bantamsklip, the vegetation cover is not nearly as dense as Thyspunt and it was possible to verify the large drop in archaeological sensitivity beyond 300m inland of the shoreline via foot surveys. Both project sites therefore have an inland zone setback from the shoreline that will have a low impact on archaeological resources.

The palaeontological investigation undertaken for the proposed development at Bantamsklip indicates that, although several of the geological units underlying the broader area are regionally fossiliferous, no in situ palaeontological heritage resources were identified within the development footprint during the field assessment. The site is predominantly underlain by Quaternary aeolian deposits of the Bredasdorp Group (including the Waenhuiskrans and Strandveld formations) and quartzitic bedrock of the Peninsula Formation (Table Mountain Group), all of which are extensively covered by vegetation, soils, and calcretised sands.

While the Bredasdorp Group coastal formations are known regionally to preserve marine and terrestrial fossil material, surface exposures within the development area are limited, vegetated, and locally disturbed, and only sparse, fragmentary shelly invertebrate material of limited scientific significance was recorded. No vertebrate fossils, trace fossil assemblages, or fossil-rich contexts were identified. As a result, the likelihood of encountering scientifically significant fossil material during construction is considered low. Ground-disturbing activities associated with the proposed development therefore present a low risk to palaeontological heritage resources, although a residual possibility of chance fossil discoveries remains during deeper excavations into subsurface sediments or calcretised horizons.

The palaeontological investigation undertaken for the proposed development at Thyspunt indicates that, although several of the geological units underlying the broader area are regionally fossiliferous, no in situ palaeontological heritage resources were identified within the development footprint during the field assessment. The site is predominantly underlain by Quaternary aeolian deposits of the Algoa Group and quartzitic bedrock of the Table Mountain Group, both of which are extensively covered by vegetation, soils, and calcretised sands.

While the Algoa Group coastal formations are known regionally to preserve marine and terrestrial fossils, surface exposures within the development area are limited and disturbed, and no fossil material was recorded. As a result, the likelihood of encountering scientifically significant fossil material during construction is considered low. Ground-disturbing activities associated with the proposed development therefore present a low risk to palaeontological heritage resources, although a residual possibility of chance fossil discoveries remains during deeper excavations into subsurface sediments.

The overall impact significance of the development on palaeontological heritage is assessed as low at both sites, provided that appropriate mitigation measures are implemented.

The cultural landscape study has revealed a series of very high heritage sensitivities at both Bantamsklip and Thyspunt. Half of the Bantamsklip project site is listed as a Grade IIIA landscape unit in the Overstrand Municipal Heritage Inventory and the current context of the site has been described as an area “of very high and high sensitivity in an overwhelmingly wilderness natural landscape with fine grained human elements, which would be unable to be supported from a cultural landscape perspective. The concern relates specifically to the Agulhas National Park and surrounding Nature Reserves and Protected Areas which abut the proposed site. Further also the very high sensitive topographical features such as the scarpe and Carruthers Hill which dominate the coastal plain as well as the historic scenic local road, the R43/ R317, which has been identified as a scenic route with local heritage significance. The open coastal plain character of the landscape allows for wide vistas and long visual distances and views with very little topography, built form or vegetation for visual shielding of the proposed development.”

At Thyspunt, the cultural landscape study found “that the entire project site is located in areas of very high and high sensitivity in a natural landscape with very high archaeological and palaeontological significance which has been provisionally protected as a Grade I Cultural Landscape, and would be unable to be supported from a cultural landscape perspective. The concern relates specifically to the provisionally protected Grade I heritage site within which the project site is located and surrounding Nature Reserves and Protected Areas which abut the proposed site. Further also the very high sensitive topographical features such as the dune field which dominate the coastal plain and have very high archaeological significance. The dune fields do offer some shielding from the visual impact of a large scale development on surrounding visual receptors but their archaeological significance outweigh any benefit this might offer. “

The weighting of the cultural landscape significance at Thyspunt therefore relies heavily on the current legal status assigned to it under the Provisional Protection of Section 29 of the NHRA. This protection automatically lapses on 01 February 2027 and can be renewed once by SAHRA. Besides the gazette notice placed on SAHRIS announcing the provisional protection on 31 January 2025, a map outlining the proposed Grade I Cultural Landscape heritage site has been created which encompasses all of the properties owned by Eskom at Thyspunt. No other information is currently available on SAHRIS outlining the motivation for the nomination as a Grade I National Heritage Site. It is therefore unclear how the proponents of the Grade I nomination have decided on the boundary to be used as the ‘site’ as these do not line up with the recommendations made by Hart in 2012 or the cultural landscape study submitted in this HIA. Much further engagement with SAHRA as the relevant heritage authority at present must be conducted to unpack the Cultural Landscape nomination.

11.3.17 NOISE

As part of the IRP 2025, Eskom envisages the introduction of 5,200 MW of new nuclear generation capacity by 2039 and are thus proposing the development of a NPP and associated infrastructure, with an installed generating capacity of up to 5,200 MW. The proposed sites being considered are Thyspunt, near Oyster Bay in the Eastern Cape Province or Bantamsklip, near Pearly Bay in the Western Cape Province.

The existing noise climate surrounding both the Bantamsklip and Thyspunt sites is predominantly influenced by natural sources with influences from the ocean, wildlife, birds and insects.

Anthropogenic influences may include activities in the adjacent towns (Oyster Bay - Thyspunt site and Pearly Beach – Bantamsklip site), agricultural activities in neighbouring farms and vehicles operating on nearby roads. A baseline monitoring exercise will be conducted during the EIA phase to quantify the current noise climate at the preferred site.

Based on a desktop assessment, five sensitive receptors were identified around the Bantamsklip site, with the closest receptor located ~1.6 km from the proposed infrastructure. The noise generating potential of the Project is anticipated to be high, however, based on the limited number of nearby receptors, it is determined that the site sensitivity from a noise perspective is classified as “low”. Based on the use of the rating tool detailed in this report, the acoustic impacts of the Project if located at the Bantamsklip site, are anticipated to be “moderate” to “low”.

Based on a desktop assessment, sixteen sensitive receptors were identified around the Thyspunt site, although eight of these receptors (all located within close proximity of the site) are residences that are currently on leased properties from Eskom. When construction of the NPP commences, these leases will expire and the residents will move out, eliminating these receptors from the acoustic assessment. The noise generating potential of the Project is anticipated to be high, although there will be no immediate/nearby inhabited receptors located close to the Project site (with the closest receptor located > 1 km from the proposed infrastructure). The proposed access road, however, will be a new road that passes close to various receptors in the Oyster Bay area which may create noise impacts on such receptors. It is therefore determined that the site sensitivity from a noise perspective is classified as “medium”. Based on the use of the risk assessment/rating tool detailed in this report, the acoustic impacts of the Project if located at the Thyspunt site, are anticipated to be “moderate”.

Based on the above, from an environmental acoustic perspective, the preferred site for the location of the proposed Project is the Bantamsklip site..

11.3.18 TOWN PLANNING

The Thyspunt site is preferred, as it is already included in the SDF. Although the St Francis settlement cluster is within the 16km monitoring and emergency zone, any rezoning applications or changes in land use already have to be submitted to Eskom Nuclear Sites Department (Koeberg Nuclear Power Station) for review and comment before approval. In addition, the stricter 0-5km exclusion area only has Oyster Bay in it. Bantamsklip has a smaller existing and future population within its 16km control zone, but it is not yet included in the Spatial Development Framework(s); amendment of the Municipal Spatial Development Framework, amendment of the Municipal Spatial Development Framework would add approval risk because development applications must prove consistency with the correlating SDF, and this SDF highlights environmental and heritage sensitivities.

11.3.19 VISUAL

The impact assessment was undertaken for the main and tallest components of the project i.e. the power plant, the communications tower and the meteorological mast as the worst-case scenario. This study evaluated the visual impact of the project sites with a view to assessing their severity based on the author’s experience, expert opinion and accepted techniques.

Construction activities include the removal of vegetation, earthworks required to create building terraces and berms for the structures and the preparation of the internal roads. Construction activities would negatively affect the landscape's visual quality and sense of place relative to its baseline. They would contrast with the patterns that define the structure of the immediate landscape and cause a significant change over a local to regional area, resulting in a moderate change to key views. However, the greatest impact would be on the site itself. Mitigation measures are minimal with the greatest effect only at night.

Operational activities include the regular cleaning and maintenance, vegetation management around the plant and powerline servitudes as well as maintenance of all other infrastructural components. Security lighting and other lighting associated with the movement of security vehicles at night. These activities along with the physical presence of the project components day and night, constitute the visual impact.

Decommissioning and closure activities include the dismantling and removal of all infrastructure and the rehabilitation of the site back to its current, mostly natural, state.

The description of the visual impacts of the phases of construction and decommissioning phases is not considered as significant visual impacts since the period of activity is of relatively short duration and of a primary impact (localized, of short duration and easily mitigated at the end of the phase). The fact that disturbed areas, e.g. construction camps / lay-down areas will be rehabilitated also reduces the impacts of these phases.

It is the operational phase that presents the most significant long term visual impact. This is due primarily to the scale and form of the proposed development.

The project will exert, for both Thyspunt and Bantamsklip sites, a **negative** influence on the visual environment. This is largely due to the:

- High visibility of the of the NPP due to its huge size and within the study area.
- The high visibility of construction and operation activity within the low growing, uniform open coastal landscape of uniform visual pattern.
- The low VAC of the area due to the low and uniform visual pattern of vegetation which does not allow for the project to be visually accommodated within the landscape as a result of the high visual contrast and absent screening.
- The scale of the project in a rural/coastal setting.
- The introduction of an extensive project within a rural unspoilt setting that will be brightly lit by security lighting including red flashing aviation warning/hazard lights on the top of the masts throughout the night.

Impacts on views are the highest when viewers are sensitive to change in the landscape, and the view is focused on and dominated by the change. The project's visual impact will cause moderate changes in the landscape that are noticeable to people viewing the project.

However, the visibility impact reduces exponentially the further the viewer is from the proposed development. The highest impact is in the 0 – 2.5 km one to where it becomes insignificant beyond 15 km.

The existing visual condition of the landscape that may be affected by the proposed NPP has been described. The study area's scenic quality has been rated *low* within the context of the sub-region.

The project site is in a *High* rated landscape type. Sensitive viewing areas and landscape types have been identified and mapped, indicating potential sensitivity to the project.

Thyspunt

These sensitive visual receptors include the western edge of Cape St. Francis, the private nature reserve Rebelsrus, travellers on the main roads such as the coastal road from St Francis Bay to Oyster Bay, R330, R102 and the N2.

Bantamsklip

Sensitive receptors include the village of Pearly Beach, a popular holiday destination, Buffeljachtbaai, a small settlement to the east of the site and Quoin Point. Several activities and institutions rely on the aesthetic environment such as game farms, national parks, lodges, guesthouses several private nature reserves. These include Groot Hagelkraal Naute reserve, Quoin Point Nature Reserve, Agulhas National Park, Uilkraalsmond Nature Reserve and Kleyn Kloof private nature reserve. Other sensitive receptors are travellers in the R43 which becomes the R317 and the road to Buffeljachtbaai. Dyer Island Provincial Nature Reserve lies about 15 km west of the site off the coastline. There are few homesteads along this section of the coast. Most are around the Buffeljachtbaai village.

Opinion and recommendation

Both sites are in similar pristine landscapes which exhibit a high level of aesthetic appeal. Both are located along sections of unspoilt coastline. The high-level impact assessment rates both sites as having a HIGH significant impact rating during operation.

However, Thyspunt is visually isolated, to a greater extent, due to the visually screening effect of the surrounding longitudinal dunes and vegetation, than is Bantamsklip. This has resulted in that there are less sensitive visual receptors impacted by the Thyspunt site than those impacted by the Bantamsklip site. Oyster Bay is visually screened from the site while the western edge of Cape St. Francis is visible but is 11 km away and the impact is regarded as low.

Bantamsklip is less visually isolated. The R43 road is within a km of the site which exhibits a high visual impact. Pearly Beach is in direct line of sight and approximately 7 km away where the visual impact on viewing distance is regarded moderate. Buffeljachtbaai is 5 km to the east where the visual impact on viewing distance is regarded high. There are several nature reserves and a national park that fall within the viewshed of the NPP, many of which are within the 5 km zone of high impact.

Based on the field observations and the studies herein and with the implementation of the mitigation measures, it is the Visual Specialist's opinion that the preferred site to be selected for further investigation is the site located at Thyspunt.

It is also the opinion of the Visual Specialist's that the visual impacts associated with the proposed Project are of a nature, scale and duration that will require mitigation to slightly reduce the impact during the operational phase.

11.3.20 HEALTH RISKS

Thyspunt

The baseline health status of the exposed communities is an important determining factor considered in the assessment of health impacts. The baseline health status is assessed by means

of a desktop study of available health data for the receptor area, providing information on the underlying burden of disease for the RAHIA and to identify specific vulnerabilities that might influence health impacts associated with the proposed operations.

Causes of death in the Eastern Cape province and in the Sarah Baartman DM (where available) were assessed as an indication of the vulnerability of the receptor population to the health effects of PM_{2.5} emissions originating from the NPP construction and operation.

Age is a determinant of vulnerability, since younger children (the under-15 age group) and older persons (the 65+ age group) are more vulnerable to the health effects of air pollutants. Without discriminating by age, the receptor communities are moderately more vulnerable to the cardiovascular and respiratory effects of PM_{2.5}. Considering specifically the under-15 age group, a low degree of increased vulnerability to the cardiovascular and respiratory effects of PM_{2.5} is indicated. Increased vulnerability to cardiovascular effects is not shown in the older (65+) age group, but moderately increased vulnerability to respiratory effects is indicated. Vulnerability in the older age group is significant for Ward 12 (on the north-eastern edge of the 10-km radius local study area), where more than 40% of the population is aged 65+, in comparison to only 4% in Ward 1, which constitutes the main portion of the 10-km radius study area. However, whether aged communities are exposed, and the degree of exposure, will only be clear once the completed AQIA study is available. At that time, a complete PM_{2.5} exposure- and health impact assessment will be conducted, with specific attention to the older population group.

Bantamsklip

Causes of death in the Western Cape province and in the Overberg DM (where available) were assessed as an indication of the vulnerability of the receptor population to the health effects of PM_{2.5} emissions originating from the NPP construction and operation.

Age is a determinant of vulnerability, since younger children (the under-15 age group) and older persons (the 65+ age group) are more vulnerable to the health effects of air pollutants. Without discriminating by age, the receptor communities are vulnerable to the cardiovascular and respiratory effects of PM_{2.5}. Considering specifically the under-15 age group, a low degree of cardiovascular vulnerability is indicated, but not respiratory vulnerability.

Increased vulnerability to health effects is not shown in the older (65+) age group. This is an important consideration for Ward 11, within which the entire 10-km radius study area is located, and where more than 30% of the population is aged 65+. However, whether aged communities are exposed, and the degree of exposure, will only become clear once the completed AQIA study is available. At that time, a complete PM_{2.5} exposure- and health impact assessment will be conducted, with specific attention to the older population group.

11.3.21 CLIMATE CHANGE

This CCIA Scoping Report has provided a preliminary, high-level overview of the Project's potential contribution to climate change and its potential vulnerability to climate-related risks. The purpose of this scoping-level assessment has been to identify material climate-related issues that warrant further investigation and to define an appropriate scope and methodology for their detailed assessment during the EIA phase.

Given the scale, long operational lifespan and safety-critical nature of the proposed NPP, together with its associated infrastructure and coastal setting, it is recommended that a full, project-level

CCIA be undertaken during the EIA phase, which will provide a detailed, integrated assessment of climate change considerations relevant to the project and will comprise three interrelated components:

- A detailed GHG inventory and climate impact assessment;
- A climate change vulnerability and resilience assessment; and
- The identification and evaluation of mitigation and adaptation measures, where relevant.

The full CCIA will be undertaken for the preferred site (Thyspunt), based on refined project layouts, technology-envelope parameters, cooling configurations and associated infrastructure details, and will be informed by updated climate data and specialist inputs.

11.3.22 RADIOLOGICAL IMPACTS

The average doses for people living near the sites are typical of the low background radiation dose for people living at the coast and away from industrial areas. Results for radioactivity concentrations in water, soils, and the air are low when compared to global average values.

Elevated radiation levels from NORM, when compared to the NORM of most soils at the sites, were measured on man-made constructions such as roads and buildings. Aggregate imported into for construction typically contains higher NORM than the natural soils and dunes.

An interesting radiation anomaly was identified during mobile gamma radiation surveys of farm areas at Thyspunt. The high NORM concentrations were found in rock samples from an area next to the Grassy Ridge farm dam and should be investigated further. The radioactivity profile of the material is typical of a heavy mineral sand deposit. It is also recommended that the owner of the farm be made aware that the material should not be removed, for example to be used as aggregate. A small quarry is located in the immediate vicinity of the outcrop where the material is found, and the possibility exists that the material may be distributed into the wider public domain if the quarry continues production.

The only radiation anomaly that was identified at Bantamsklip during the mobile gamma radiation surveys was on a dirt road from Pearly Beach to Viljoenshof. Radioanalysis of a soil sample confirmed the high NORM concentrations when compared to most of the soils in the area.

Of all the naturally occurring radionuclides measured in samples, Po-210 is probably the most significant. High Po-210 concentrations, a decay product of radon gas (Rn-222) were measured in the marine biota. People whose regular diet includes large amounts of freshly harvested seafood receive a significantly higher dose from ingestion than does the average person.

Radioanalysis of white mussel samples collected Duynefontyn indicated one detect of a nuclide that can be attributed to the Koeberg NPP with hundred per cent certainty. It is an isotope of silver, Ag-110m. A comparison of the radiotoxicity of the two nuclides Ag-110m and Po-210 indicates that people whose regular diet includes large amounts of freshly harvested seafood receive a significantly higher dose from Po-210 than from Ag-110m.

The potential radiological impact on abalone farming near Bantamsklip could be a sensitive environmental issue for a future NPP. There is an abalone farm near Gansbaai and another abalone farm is under construction at Buffeljags. It will be important to obtain baseline data on abalone should a NPP be constructed at the site.

The two key artificial radionuclides, Cs-137 and Sr-90, could be detected in samples. It is unlikely that the radioactivity discharged during normal operations by a future NPP at either Thyspunt or Bantamsklip, will significantly inflate these ambient levels.

People living near the sites receive a background radiation dose that is estimated to be less than 2 mSv/y and therefore lower than the average global dose. The annual dose reported by the operating Koeberg NPP and based on allowable discharges of artificial nuclides, is a small fraction of the natural background dose, i.e. < 0.010 mSv/y.

Monitoring of environmental radioactivity prior to commissioning of the NPP will be conducted to establish a baseline. It will include further investigation of site-specific values for important parameters in the dose assessment model of which examples were discussed in this report. This will be followed by on-going monitoring of operational radionuclide discharges and actual levels of radioactivity in environmental media and food commodities. Periodic surveys of demographical changes and habits will also be carried out to determine a realistic critical group for which the annual doses from normal operations have to be reported to the NNR.

11.3.23 TRAFFIC

Thyspunt

Based on preliminary scoping studies and assessments, the Thyspunt site has been identified as the preferred location for the proposed Nuclear Power Plant. The transport of heavy equipment presents a significant challenge, particularly at the Bantamsklip site. Should Bantamsklip be selected as the preferred site, alternative transport solutions—such as revised overland routes or barge transport—would need to be considered.

In contrast, Thyspunt offers comparatively easier access for the transport of heavy equipment, as well as for other nuclear-related logistics. Its close proximity to Gqeberha Harbour further facilitates efficient handling and delivery of incoming goods.

These findings are based on preliminary assessments and will be re-evaluated once a detailed TIA has been undertaken and additional project-specific information becomes available.

This section identifies the potential transport-related impacts to be assessed, sets out the approach to significance screening during scoping.

Key Issues and Potential Impacts to be Assessed

- Site Access: location, sight distance, intersection control and capacity and the need for turning lanes.
- Emergency Evacuation: network performance and ETE for surrounding settlements and the site workforce/visitors.
- Abnormal Load Transport: route feasibility from national/provincial network to site; vertical/horizontal clearance constraints and permitting.
- Fuel Transport: routing, frequency, safety and compliance.
- Radioactive Waste Transport: low- to medium-level routing to Vaalputs; interface with hazardous goods regulations.
- Construction Traffic: workforce and materials haul; staging and Traffic Management Plan; seasonal tourism peaks.
- Operational Traffic: daily staff trips, parking, and occasional deliveries.
- Public Transport and NMT Safety: stops, embayment's, walkways and crossing needs.

- Road Condition and Maintenance: provincial link road condition and upgrade needs along approaches to the site.

Preliminary recommendations

Based on the scoping-level assessment, the following preliminary recommendations are made:

- Proceed to detailed TIA with focus on R330/R102 nodes and N2 ramps at Humansdorp.
- Develop and implement a Construction Traffic Management Plan prior to bulk works.
- Identify and secure abnormal load corridors and protective measures early with authorities.
- Plan targeted maintenance/rehabilitation for poor-condition sections (notably on R102 near the Oyster Bay access).
- Confirm access geometry and control to meet TRH 26 requirements, with dedicated turning lanes where warranted.
- Enhance pedestrian safety where demand exists (walkways, crossings) and formalise PT embayment's as needed.
- Coordinate with emergency planners to align evacuation routing and staging.
- Possible upgrading of the Voortrekker Road/ Main Street intersection, further investigation is required during the assessment phase.

Bantamsklip

Based on preliminary scoping studies and assessments, the Thyspunt site has been identified as the preferred location for the proposed NPP. The transport of heavy equipment presents a significant challenge, particularly at the Bantamsklip site. Should Bantamsklip be selected as the preferred site, alternative transport solutions—such as revised overland routes or barge transport—would need to be considered.

In contrast, Thyspunt offers comparatively easier access for the transport of heavy equipment, as well as for other nuclear-related logistics. Its close proximity to Gqeberha Harbour further facilitates efficient handling and delivery of incoming goods.

These findings are based on preliminary assessments and will be re-evaluated once a detailed TIA) has been undertaken and additional project-specific information becomes available.

Based on the status quo assessment and the nature of the proposed Nuclear-1 development, the following key transport issues and potential impacts have been identified for detailed assessment during the EIA and TIA phases:

- Site Access and Road Geometry: Feasibility of proposed access points to the site, including compliance with TRH 26 access management requirements, adequate sight distances, intersection spacing, and the need for turning lanes, channelisation or access control measures.
- Construction Traffic Impacts: Increased traffic volumes associated with construction workers, delivery of materials and equipment, and construction plant. Potential impacts include reduced levels of service on provincial roads, increased road safety risk, and temporary disruption to local traffic and tourism movements.
- Abnormal and Heavy Load Transport: Transport of oversized and heavy components during construction, including route suitability, geometric constraints, pavement capacity, bridge and culvert limitations, and the need for temporary works, escorts or route modifications.

- Operational Traffic: Daily staff trips, service vehicles and periodic deliveries during the operational phase, including parking demand, on-site circulation and interaction with the external road network.
- Nuclear Fuel and Waste Transport: Infrequent transport of nuclear fuel to the site and low- to medium-level radioactive waste to off-site facilities, requiring compliance with hazardous materials regulations and coordination with relevant authorities.
- Emergency Evacuation: Performance of the surrounding road network under emergency evacuation scenarios, including ETE, route capacity, network resilience and coordination with emergency services.
- Public Transport and Pedestrian Safety: Safety and accessibility of minibus taxi operations, pedestrian movements and informal stopping areas along provincial roads, particularly within nearby settlements.
- Cumulative and Seasonal Effects: Interaction of project-related traffic with seasonal tourism peaks and other planned developments in the region.
- Preliminary recommendations

Based on the scoping-level assessment, the following preliminary recommendations are made:

- New site access roads should be designed to full TRH 26 standards, with appropriate turning lanes and access control to ensure safety and operational efficiency.
- A dedicated Construction Traffic Management Plan should be implemented to manage construction-related impacts and protect road safety.
- Abnormal load routes should be confirmed early in the project, with advance engagement with road authorities to address constraints and permitting requirements.
- Public transport stopping areas and pedestrian facilities within nearby settlements should be reviewed and upgraded where necessary to improve safety.
- Emergency evacuation planning should be integrated with local and provincial emergency management structures and refined through detailed modelling.

These recommendations will be reviewed and refined during the detailed Transport Impact Assessment phase.

11.4 **PREFERRED ALTERNATIVES FOR INCLUSION IN THE EIA PHASE**

11.4.1 **MOTIVATION FOR PREFERRED SITE**

An important consideration in the EIA process is ensuring efficacy. By efficacy it is meant that while full disclosure must be ensured, that it is incumbent on the practitioner to ensure that all information provided is relevant to decision-making. Given the public interest in EIAs and Nuclear 1 in particular the temptation is to include information 'just in case' rather than because there is a direct, specific need to provide the information for decision-making purposes. The net effect of providing all information rather than providing information that is directly required for decision-making is to make the documentation cumbersome and difficult to read and to distract stakeholders from the direct purpose of the EIA which is informed decision-making.

The preferred site per specialist theme resulting from the scoping phase specialist studies is summarised in Table 11-3.

Table 11-3 – Summary of Preferred Site per Specialist Theme

ASPECT	PREFERRED ALTERNATIVE
PHYSICAL ENVIRONMENT	
Air Quality	Bantamsklip (but both are suitable)
Dune Geomorphology	Bantamsklip
Geohydrology	Neutral
Freshwater	Neutral
Surface Water	Neutral
Marine Physical, Water Quality, Sediment Transport and Shoreline Change	Thyspunt
Agriculture	Bantamsklip (Thyspunt slightly higher impact due to inland section taking agricultural land)
Geotechnical	Neutral
BIOPHYSICAL ENVIRONMENT	
Fauna and Invertebrates	Neutral
Flora	Bantamsklip
Terrestrial Biodiversity	Thyspunt
Aquatic Ecosystems	Bantamsklip (Thyspunt can be a preferred site but would require stringent attention to mitigation requirements, upfront commitment to conservation activities from Eskom; and ring-fencing of management funds for conservation areas.)
Marine Ecology	Thyspunt
Avifauna	<u>Neutral</u>
SOCIAL	
Socio-Economic Impacts	<u>Thyspunt</u>
Heritage	Thyspunt
Noise	Bantamsklip
Town Planning	Thyspunt
Visual	Thyspunt
Health Risks	Neutral
ADDITIONAL STUDIES	
Climate Change	Thyspunt (by small margin)
Radiological Impacts	Neutral
Radioactive waste management and Transport	Neutral
Transport	Neutral
Traffic	Neutral

Following the comparative assessment of alternative sites for the proposed NPP, it is recommended that the Bantamsklip site be scoped out of further consideration, and the Thyspunt site be further assessed as the preferred location alternative. This recommendation is based on a combination of technical readiness, findings from specialist assessment undertaken during scoping where

Bantamsklip was overall least favoured (Table 11-3), infrastructure constraints and strategic alignment to meet implementation time-frames (Table 6-4).

A key consideration is the comparatively low level of site readiness at Bantamsklip. Substantial gaps remain in baseline information pertaining to nuclear safety and licensing studies. Addressing these gaps would require extensive additional time and financial investment, resulting in material delays to the project schedule. In contrast, Thyspunt has benefitted from prior investigations and regulatory processes, enabling a more realistic alignment with national timelines for the delivery of new nuclear capacity.

Bantamsklip's relative remoteness from the existing transmission network and major demand centres significantly increases the cost, complexity, and risk associated with grid integration. Connecting the site would require building more extensive new high-voltage transmission infrastructure across long distances, resulting in higher capital expenditure, prolonged construction timelines, and additional environmental and social impacts in multiple regions. These transmission challenges present a substantial constraint, further reducing the site's overall feasibility and cost-effectiveness at this stage.

Strategically, Bantamsklip is misaligned with broader spatial, energy, and development goals. Its distance from major electricity demand centres and industrial hubs limits opportunities for synergy with existing infrastructure and economic development nodes, especially when compared to Thyspunt, which is better integrated into established planning frameworks.

These factors collectively undermine the purpose of scoping, which is to prioritise alternatives that are realistically capable of being authorised and delivered within required national timelines.

In conclusion, continued inclusion of the Bantamsklip site in the study at this stage would introduce avoidable technical, environmental, financial, and schedule risks, without providing commensurate benefits. Scoping the site out at this stage allows the assessment process to focus on Thyspunt as a more viable and strategically aligned alternative, supporting a defensible, efficient, and risk informed site selection outcome for the NPP.

Thyspunt is identified as the preferred site for the proposed nuclear power plant due to its advanced level of regulatory readiness, strategic suitability, and alignment with national energy planning objectives. The site has been the subject of extensive previous investigations, including detailed environmental, geotechnical, marine, and radiological studies, as well as engagement with the NNR through the NISL process. This established baseline significantly reduces project risk and uncertainty when compared to alternative sites, enabling a more efficient progression through the environmental authorisation and nuclear licensing processes in support of the timelines envisaged in the IRP.

Furthermore, the grid benefits of the two sites are not equivalent. Thyspunt offers stronger near-term advantages due to its proximity to existing network infrastructure and its position within established transmission corridors that support power transfer toward the North Network. This results in:

- Lower transmission losses (due to shorter transfer distances)
- Improved utilisation of existing infrastructure
- Reduced need for extensive upstream reinforcements

The location of large generation facilities plays a critical role in ensuring reliable and efficient power system operation. Power stations must be located where the transmission network can safely and

reliably transport electricity to load centres. Sites closer to strong transmission infrastructure or major demand centres reduce the need for extensive new transmission lines, minimise losses, and improve grid stability. Conversely, remote sites require substantial new infrastructure to enable reliable integration. Therefore, site selection must balance environmental, economic, and grid-related considerations to ensure long-term system performance and resilience.

From a power system perspective, transmission planning studies indicate that geographically dispersing nuclear generation across different supply areas (e.g. Duynefontein and Thyspunt) improves grid resilience by reducing reliance on single transmission corridors, lowering common-mode risks, and enhancing overall system stability through more distributed system strength and inertia. This configuration is therefore more desirable than concentrating multiple units within the same network region. In addition, indicative grid integration assessments show that Bantamsklip would require significantly greater transmission investment (including longer and more extensive high-voltage corridors) and would have higher associated environmental and servitude impacts compared to Thyspunt. In comparison, Thyspunt benefits from closer proximity to existing transmission infrastructure, resulting in shorter connection distances, reduced environmental disturbance, and lower implementation complexity relative to Bantamsklip.

From a spatial, technical, and infrastructure perspective, Thyspunt offers clear advantages. The site is owned by Eskom, is appropriately zoned and safeguarded for nuclear development within provincial and municipal planning frameworks and is located in reasonable proximity to existing transmission infrastructure and load centres. This reduces the need for extensive new linear infrastructure, limits land acquisition and servitude requirements, and lowers the potential for additional environmental and social impacts associated with grid connection and access development.

Importantly, specialist screening undertaken to date has not identified any unmitigable environmental constraints at Thyspunt. While the site is environmentally sensitive, the nature, extent, and distribution of key ecological features allow for impact avoidance, minimisation, and effective mitigation through appropriate design and layout controls. In combination with its regulatory maturity, infrastructure suitability, and planning alignment, Thyspunt represents the most feasible and sustainable option for the development of new nuclear capacity in South Africa and is therefore recommended as the preferred site to be taken forward in the assessment process.

It must be noted that this does not mean that Bantamsklip can never be considered for a future NPP. The site is not fatally flawed and remains a viable site for an NPP.

11.4.2 MOTIVATION FOR PREFERRED TECHNOLOGY

In accordance with Chapter 6, the assessment of alternatives is undertaken in line with the 2014 EIA Regulations, focusing on feasible and reasonable options capable of meeting the project's purpose. Within this context, energy alternatives are considered at a screening level, recognising that not all energy generation technologies are suitable for the proposed locations or able to meet the required scale and operational characteristics of the project.

The proposed Nuclear Power Plant is intended to provide up to 5 200 MW of electricity and therefore requires a technology capable of delivering large-scale, continuous, and non-fluctuating power. The Draft Scoping Report indicates that alternative energy sources, while important within the national energy mix, may not be able to provide the same level of firm, dispatchable capacity on a like-for-like basis at the required scale or within the site-specific constraints.

The preference for nuclear energy is further supported by alignment with national policy and planning frameworks, particularly the Integrated Resource Plan (IRP 2025), which makes provision for the addition of 5 200 MW of nuclear capacity by 2039 as part of a diversified energy mix. This policy position reflects the role of nuclear energy in ensuring security of supply, reducing reliance on fossil fuels, and contributing to long-term climate change mitigation objectives.

Furthermore, nuclear energy contributes significantly to climate change mitigation objectives by providing low greenhouse gas emissions during operation, thereby supporting South Africa's commitments to reduce emissions and achieve net-zero targets. This aligns with both national policy direction and international obligations, positioning nuclear as a key component of a Just Energy Transition.

While renewable energy technologies and storage are recognised as important components of the broader energy mix, the scoping phase emphasises that these alternatives are not directly comparable on a like-for-like basis with nuclear in terms of providing firm, large-scale baseload capacity in isolation. Strategic energy system optimisation and comparative assessment of alternative mixes are addressed at a national planning level rather than within the scope of a project-level EIA.

Accordingly, the proposed nuclear power plant is motivated as a necessary and policy-aligned intervention to ensure reliable, low-carbon electricity supply at the scale required, complementing other energy sources within a diversified national energy portfolio.

11.4.3 DESCRIPTION OF PROJECT ALTERNATIVES

The EIA process identifies two types of project alternatives:

- Concept Level Alternatives, which relate to the site, technology and process alternatives.
- Detailed Level Alternatives which relate to mitigation measures.

The feasibility of the higher-level Concept Alternatives was discussed within Section 6 of this report. The Detailed Level Alternatives which relate to design and mitigation measures, will be addressed within the EIA Report.

Table 11-4 outlines the alternatives considered feasible from an environmental perspective to be assessed in the EIA Phase.

Table 11-4 – Alternatives to be Assessed in the EIA Phase

Project Alternatives	
Preferred Site	Thyspunt (see motivation above)
Preferred Energy Alternative	Nuclear (see motivation above)
Design Alternatives	Cooling / Intake Alternatives: ■ Evaporative Cooling ■ Once through Cooling

Project Alternatives	
	■ Stilling basin ²⁰⁶ ■ Off-shore pipeline alternatives
	Effluent Discharge technologies
	Footprint Alternatives
	Access Roads: Eastern and Western Access roads (alignment alternatives)
	Freshwater Supply: Groundwater versus desalination
	Spoil Disposal: ■ On-land (beach) disposal ■ Offshore disposal ■ <u>Cut and fill civil engineering alternative (onshore / on-site)</u> ²⁰⁷
No-Go Alternative	This will be further considered in the EIA phase

11.5 ASPECTS TO BE ASSESSED IN THE EIA PROCESS

Table 11-5 outlines the key aspects that were identified in the scoping phase; these aspects will be subject to further assessment in the EIA Phase.

The PPE approach presented in Section 4 defines the bounding design parameters that all potential reactor technologies must comply with, and these parameters will be applied consistently across all specialist assessments during the EIA phase. As such, a range of reactor configurations (proven technologies) falling within this envelope will be assessed based on a credible worst-case scenario approach to ensure that potential environmental impacts are comprehensively evaluated and remain within the defined envelope limits.

Table 11-5 – Summary of aspects to be addressed in the EIA Phase

Environmental Aspect	Impact
Air Quality	■ Construction PM₁₀ Concentrations and Dustfall rates ■ Operation PM₁₀, SO₂, NO₂, CO, Ammonia and Formaldehyde Concentrations ■ Decommissioning PM₁₀, SO₂, NO₂, and CO Concentrations, and Dustfall rates ■ Cumulative impacts
Dune Geomorphology	■ Construction, Operation and Decommissioning Development of roads and other infrastructure on mobile dunes

²⁰⁶ This alternative is added as a result of the overwhelming number of concerns raised regarding thermal impacts during the DSR public review period

²⁰⁷ This alternative is added as a result of the overwhelming number of concerns raised regarding off-shore spoil disposal during the DSR public review period.

Environmental Aspect	Impact
	Development of NNP, roads and other infrastructure on artificially vegetated dunes Development of NNP, roads and other infrastructure on mobile dunes, naturally vegetated dunes and artificially vegetated dunes Cumulative impacts
Geohydrology	- Construction - Aquifer Depletion: Dewatering - Aquifer Depletion: Groundwater Supply - Groundwater Contamination - Operation - Groundwater Contamination - Decommissioning - Groundwater Contamination
Freshwater	- Construction - Depletion of aquifers - Impact on surf zone - Effect of brine on surf zone - Operation - Depletion of aquifers - Impact on surf zone - Effect of brine on surf zone
Surface water	- Construction - Increase in Runoff - Increase in Erosion - Changes in Flow Path - Pollution of surface water - Operation - Increase in Runoff - Increase in Erosion - Changes in Flow Path - Pollution of surface water
Marine Physical, Water Quality, Sediment Transport and Shoreline Change	- Dredging and Spoil Disposal Activities - On-beach placement – sediments on the bottom and thickness - On-beach placement – turbidity and suspended sediments - On-beach placement – ecology - Nearshore disposal – sediments on the bottom and thickness - Nearshore disposal – turbidity and suspended sediments - Nearshore disposal – ecology - Offshore disposal – sediments on the bottom and thickness - Offshore disposal – turbidity and suspended sediments - Offshore disposal – ecology - Spoil disposal impacts on surf breaks - Dredging impacts – Seabed excavation, morphology change and coastal processes - Dredging impacts – Water quality - Dredging impacts – Ecology - Dredging – Construction and operational impacts - Shoreline Change - Short term disruption of sediment transport - Local scour around temporary works - Dune/backshore disturbance

Environmental Aspect	Impact
	Beach erosion due to on-beach or surf zone outfall discharge Local sediment transport disruption from permanent structures – pipelines Local sediment transport disruption from permanent structures – stilling basin and outfall structure Exposure of buried pipelines/structures due to future erosion Pipeline outfall exposure/scour to adjacent areas risk under future erosion Maintenance dredging spoil management as a sediment budget issue Long-term coastline recession (SLR and climate change) Wave-climate-driven shoreline rotation / planform change Event-driven storm erosion overlay (cross-shore beach erosion during storms) Localised rocky-coast retreat where erodible deposits occur Chronic sedimentation at intakes Storm-driven “pulse” sand ingress at intakes Tsunami-driven erosion/deposition ■ Cooling and Desalination Beach erosion due to on-beach or surf zone outfall discharge Plume dispersion of brine (stilling basin and raceway and offshore tunnel intake and outfall) Thermal plume dispersion (stilling basin intake and raceway outfall) Thermal plume dispersion (offshore tunnel intake and outfall) Damage to intake or outfall structures due to abnormal/extreme metocean conditions Blockage of intake pipes or outfall pipes Natural or climate-change-driven sea water temperature increases (impact to cooling system) Recirculation of thermal plume (stilling basin intake and raceway outfall) Recirculation of thermal plume (offshore tunnel intake and outfall) ■ Seismic Significance: Tsunami's Extreme water levels due to distant tsunamis Extreme water levels due to local, slump-generated tsunamis Extreme water levels due to meteo-tsunamis Exposure of cooling water intake or outfall pipes Exposure of cooling water basin (intake) or raceway (outfall) Inundation and scour impact to intake and outfall pipes Sediment deposits disrupting cooling water structures, inlets and/or outlets ■ Accidental Spill (indicative) Accidental spill impacts (indicative)
Agriculture	■ Construction Loss of future agricultural production potential ■ Operation Loss of future agricultural production potential
Geotechnical	■ Seismic Hazard ■ Geotechnical – Slope Stability ■ Geotechnical – Soil erosion from clearing of sites for drilling and test pitting ■ Geotechnical – Potential Hydrocarbon (oils, fuels and chemicals) spillages during drilling (geotechnical investigations) ■ Geological – Volcanic Activity ■ Geological – Surface Rupture
Fauna and invertebrates	■ Construction Loss of habitat Encroachment of AIP species in disturbed areas Direct mortality of vertebrates species

Environmental Aspect	Impact
	Emigration of fauna Reduced dispersal/migration of fauna Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, light and dust Loss of habitat for invertebrate species Direct mortality of invertebrate species Introduction of alien invasive invertebrate species Light pollution impacts on invertebrates Noise pollution impacts on invertebrates Dust pollution impacts on invertebrates - Operation Habitat fragmentation and movement restriction Direct mortality of vertebrate species, mainly from road mortality (operational traffic) Encroachment of alien and invasive species in disturbed areas. Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, light and dust Direct mortality of invertebrate species. Introduction of alien invasive invertebrate species Light pollution impacts on invertebrates Dust pollution impacts on invertebrates - Decommissioning Direct mortality of fauna due to decommissioning activities Habitat degradation that drives displacement and longer-term population effects and persistence of post-decommissioning disturbance. - Cumulative impacts
Flora	- Reduction in populations of threatened plant species - Cumulative impacts
Terrestrial Biodiversity	- Impacts on critical biodiversity areas - Impacts on threatened ecosystems - Impacts on protected areas - Disruption of ecosystem processes - Establishment and spread of alien invasive plant species - Cumulative impacts
Aquatic ecosystems	- Construction Wetland loss and/or degradation - Operation Wetland loss and/or degradation Wetland loss and/or degradation - Decommissioning Wetland loss and/or degradation Wetland conservation - Cumulative impacts
Marine ecology	Construction Intertidal habitat loss and disturbance. Subtidal habitat loss and disturbance. Pelagic open water habitats disturbance. Smothering impacts on benthic fauna in sediment disposal area

Environmental Aspect	Impact
	Turbidity impacts of sediment disposal on pelagic fauna. Turbidity and smothering impacts of sediment disposal on squid stock and fishery. (Re)mobilisation of oxygen depleting substances, nutrients and noxious substances from disposed Above water noise impacts. Below water noise impacts. Impacts of artificial lighting. Disturbance and/or mortality of marine life due to the intake of seawater for desalination. Impacts to marine biota due to brine discharge. Impacts to marine biota due to discharge of desalination co-pollutants. Discharge of sewerage effluent Impacts on fisheries due to exclusion zones. ■ Operation Disturbance and/or mortality of marine life due to the intake of seawater. Impacts of highly saline discharge water (brine) diluted with cooling water. Impacts of thermally elevated discharge water. Potential impacts of co-pollutant discharges. Operational noise impacts. Potential impacts of exclusion areas on biodiversity. Potential impacts of exclusion areas on fisheries. ■ Cumulative impacts
Avifauna	■ Construction Habitat destruction within the project footprint Destruction, degradation and fragmentation of surrounding habitats Displacement/emigration of avifauna (incl. SCC) Direct mortality (clearing, traffic, poaching, egg collection) ■ Operation Thermal pollution of water Radiological contamination (accidental release) Destruction and degradation of surrounding habitats Bird collisions with cooling towers/large structures Bird Disturbance due to Increased or Chronic Light and Sound Pollution Direct mortality/disturbance (vehicle and human presence) ■ Decommissioning Direct mortality (earthworks, vehicle collisions, persecution) Inability of avifauna to immigrate (continued habitat degradation) Radiological contamination during decommissioning ■ Cumulative impacts
Social and Tourism	■ Construction Job creation Influx of job seekers Associated infrastructure development Local economy Loss of agricultural land Dust Noise Visual Spatial planning

Environmental Aspect	Impact
	Devaluation of property Property value increase Fisheries Community health, safety and security Outward migration of construction workers Traffic Cultural heritage Health - Operation Tourism Provision of electricity Radiological impact on the public Financial viability of the NPP - Decommissioning Job losses Reduction in electricity Infrastructure
Economic	- Financial feasibility of the project - Gross Domestic Product (GDP) (value added to the national economy, which measures the economic growth). - Employment Creation (creation of new jobs for skilled, semi-skilled, and unskilled workers). - Capital Formation (procurement of machinery, transport equipment, buildings and other social and economic infrastructure). - Income Distribution (incremental income generated for households with a specific focus on low-income households). - Fiscal Impact (Government Revenue and Expenditure). - Balance of Payments (systematic record of all economic transactions between a country and the rest of the world over a specific period). - Effectiveness Criteria (the GDP/Capital ratio, and the Labour/Capital ratio), where effectiveness indicators of projects are measured and compared to national and sectoral effectiveness indicators to demonstrate how efficiently a particular project employs the factors of production to arrive at a certain output.
Heritage	- Construction Impacts to cultural landscape Impacts to archaeological resources Impacts to palaeontological resources - Cumulative impacts
Noise	- Construction Noise impact on surrounding sensitive receptors (negative) - Operation Noise impact on surrounding sensitive receptors (negative) - Decommissioning Noise impact on surrounding sensitive receptors (negative) - Cumulative impacts
Town planning	- Construction Spatial planning - Operation Spatial planning

Environmental Aspect	Impact
Visual	- Construction, Operation and Decommissioning Change of the landscape characteristics and key views (visual intrusion) and change to the sense of place. - Cumulative impacts
Health Risks	Construction and Operation PM _{2.5} emissions
Climate change	- Construction Water stress and drought affecting water availability Extreme rainfall and surface runoff Wildfire risk Climate-related disruption to interdependent infrastructure - Operation Increasing temperatures and long-term heat exposure Water stress and drought affecting water availability Extreme rainfall and surface runoff Wildfire risk Coastal processes Climate-related disruption to interdependent infrastructure
Radiological impacts	- Radiological Public dose - Emergency Planning and Response
Transport	- Site access - Emergency evacuation - Abnormal load routing - Fuel transport routing - Radioactive waste transport routing - Normal daily travel impacts - Existing and planned transportation infrastructure
Cumulative impacts	All studies will assess the cumulative impacts associated with the project, where applicable. Although the associated transmission lines, transport routes as well as associated activities outside of the project footprint do not form part of the scope of the current EIA, any potential high-level environmental and socio-economic interactions will, where relevant, be considered within the cumulative impact assessment to ensure a holistic understanding of the overall project footprint and its broader implications.

11.6 SPECIALIST STUDIES TO BE UNDERTAKEN²⁰⁸

The following specialist assessments have been commissioned for the EIA Phase:

- Air Quality Impact Assessment
- Dune Geomorphology Impact Assessment
- Geohydrology Impact Assessment

²⁰⁸ This section has been updated based on the comments received from stakeholders during the public review of the Draft Scoping Report.

- Freshwater supply Impact Assessment
- Surface Water Impact Assessment
- Marine Physical, Water Quality, Sediment Transport and Shoreline Change Impact Assessment
- Agricultural Impact Assessment
- Geotechnical Impact Assessment
- Faunal and Invertebrates Impact Assessment
- Flora Impact Assessment
- Terrestrial Biodiversity Impact Assessment
- Aquatic Biodiversity Impact Assessment
- Marine Ecology Impact assessment
- Avifauna Impact Assessment
- Social Impact Assessment
- Economic Impact Assessment
- Tourism Impact Assessment
- Heritage Impact Assessment
- Noise Impact Assessment
- Town planning Impact Assessment
- Visual Impact Assessment
- Health Impact assessment
- Climate Change Impact Assessment
- Radiological Impact assessment
- Radiological Waste and Transport
- Transport Impact Assessment

It should be noted that the specialist studies will be undertaken according to the procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(a) and (h) and Section 44 of the NEMA (GNR 320, dated 20 March 2020), where applicable.

The terms of reference of each specialist study has been updated / expanded with consideration of the comments received from stakeholders during the public review period of the Draft Scoping Report. A summary of the comments received per specialist study is included in **Appendix O**.

11.6.1 AIR QUALITY IMPACT ASSESSMENT

This phase involves a detailed assessment of potentially significant positive and negative impacts (direct, indirect, and cumulative) identified in the Scoping Phase. This phase considers a proposed development footprint and includes detailed specialist investigations (including field surveys) as well as public consultation associated with all phases of the project including design, construction, and operation. Recommendations of practical and achievable mitigation and enhancing and management measures, should be included. Tasks must include the following:

- The AQIA must comply with the NEMA, NWA, the relevant Strategic Environmental Management Acts (SEMA), and related environmental and social regulations.
- Consider the relevant air quality legislation and other national and international requirements.
- Apply mitigation hierarchy (a) anticipate and avoid risks and impacts; (b) where avoidance is not possible, minimise or reduce risks and impacts to acceptable levels; (c) once risks and impacts have been minimised or reduced, mitigate; and (d) where significant residual impacts remain, compensate for, or offset them, where technically and financially feasible.

- Undertake detailed specialist studies to inform the ESIA in accordance with the NEMA (Act 107 of 1998, under Regulations R982 to R985 of 2014, as amended on 21 June 2021) requirements.

Proposed Terms of Reference for the Impact Assessment

The main objective of the investigation is to quantify the potential impacts resulting due the project construction-, operational and decommissioning activities on the surrounding environment and human health. The impact assessment phase of the project needs to assess the potential for air pollution impacts from the proposed NPP. To achieve this, the following tasks will be conducted as part of the impact assessment phase:

- Update the legal section and ensure all legislative requirements are met;
- Quantification of air emissions from the project based on PPE, for both the construction and operational phases;
- Consider technology alternatives which include other forms of electricity generation such as gas and renewables in other locations and in the same location (which was not addressed in the Scoping Phase);
- Discussion of meteorological parameters required to establish the atmospheric dispersion potential;
- Calculation of the air concentrations for the preferred site using a suitable atmospheric dispersion model, including recent meteorological data and topography; and,
- Assessment of the significance of the impact through the comparison of simulated air concentrations with local NAAQS (for compliance) and dustfall rates with the NDCR.

11.6.2 DUNE GEOMORPHOLOGY IMPACT ASSESSMENT

- Field visits.
- Incorporate relevant components of the three Nuclear-1 dune morphology reports into one consolidated report.
- Update report with new information arising from specialist studies being undertaken for this ESIA, as well as new research by other institutions and specialists that has been undertaken over the past ~10 years since the Nuclear-1 EIA was completed.
- Interdune ponds and their relationship to groundwater were extensively investigated in the Nuclear-1 EIA. This will be augmented with additional information emanating from the current EIA process.
- Grain size characteristics of coastal sands in the Cape St Francis area will be investigated to determine suitability of using excavated material from the Thyspunt site for beach nourishment at St Francis Bay.
- Accuracy of wind data will be investigated.
- The diagrams from the Nuclear-1 EIA delineating dunefield changes will be updated with the most recent available images.
- Coastal sediment dynamics in the Cape St Francis area will be investigated to assist in assessing alternatives for spoils disposal. It will include a quantitative Sediment Budget Analysis modelling the anticipated future impacts of the proposed development for the construction, operational and decommissioning stages.
- Additional investigations required for changes to Eastern Haul Road and final layout of Western Haul Road.

- The climate change scenarios will require revision of impacts, based on the Intergovernmental Panel on Climate Change sixth assessment. (IPCC 2021 & IPCC 2022) and other recent publications (e.g. Horton et al, 2020; NOAA 2023).
- The potential for flood damage to the access roads and infrastructure is a multi-disciplinary study, and will draw on the climate change, hydrology and geotechnical investigations amongst others.
- The construction, operational and decommissioning phases of the project will be assessed.
- The no-go alternative will be assessed.

11.6.3 GEOHYDROLOGY IMPACT ASSESSMENT

This Scoping Report has been based on detailed investigations at both the Thyspunt and Bantamsklip sites, which started in 2008. This was initially for compilation of SSRs for submission to the NNR and then parallel studies for the EIA for Nuclear-1. Work on the Bantamsklip site stopped in 2014 whereas the Thyspunt SSR was updated as recently as 2025. The Plan of Study for the EIA Phase will therefore be as follows:

- Addressing comments from the review of the June 8 Geohydrology Scoping Report by I&APs, particularly by the Thyspunt Alliance, centering on concerns about adequacy of assessment of wetlands, sensitivity of the dual aquifer system and impacts of mixing of different groundwater chemical types (I&AP)
- Attend a workshop with Eskom, WSP and relevant specialists to:
 - Confirm the water supply source for the construction phase;
 - Confirm the water supply source for the NPP workforce (I&AP)5;
 - Confirm estimated duration of NPP footprint excavation/dewatering.
 - Confirm TDS of seawater intake for desalination.
 - Determine mitigation measures to prevent clogging of seawater intakes by e.g. marine oil spills (I&AP).
- Liaise with the Terrestrial Biodiversity; Wetlands, Marine Ecology Geomorphology, Hydrology and Water Supply specialists to ensure alignment of thinking/impacts;
- Produce a Draft EIA report with final updates/confirmation of site sensitivity, impacts and mitigation measures;
- Incorporate comments from WSP, Eskom, regulatory authorities and the public into a Final EIA Geohydrological report.

11.6.4 FRESHWATER SUPPLY IMPACT ASSESSMENT

The following activities will be carried out in order to finalise the EIR:

- Incorporation of relevant additional aspects not covered in the Scoping Report based on comments received from WSP, Eskom, the public and regulatory authorities.
- Updating of the high-level impact assessment.
- Attendance at a workshop with Eskom to confirm:
 - No use of groundwater at Thyspunt during construction, or any phase (I&AP)4;
 - TDS of intake seawater;
 - Protection of seawater intake structures against e.g. marine oil spills (I&AP)
 - Provision of desalinated water for all site staff;

- Confirmation on demineralised water production brine quantity and quality.
- Liaison with the Geohydrology, Hydrology, Marine Ecology, Terrestrial Ecology and Wetlands specialists.
- Internal Workshop and Dry Run.
- Upgrading of the Scoping Report into a Draft EIR for public and regulatory authority comment.
- Production of the Final EIR.

11.6.5 SURFACE WATER IMPACT

This Scoping Report has been based on detailed investigations at both the Thyspunt and Bantamsklip sites, which started in 2008. This was initially for compilation of SSRs for submission to the NNR and then parallel studies for the EIA for Nuclear-1. Work on the Bantamsklip site stopped in 2014 whereas the Thyspunt SSR was updated as recently as 2025. The Plan of Study for the EIA Phase will therefore be as follows:

- Incorporation of comments received from regulatory authorities, the public, and interested and affected parties during the review of the scoping report.
- Liaise with the wetland, marine ecology, aquatic and geohydrology specialists to ensure alignment.
- Liaise with road and traffic specialists to ensure access road routes, outside of Eskom property does not negatively impact downstream environment. This includes discussions with the dune geomorphology specialist and potential impacts on the downstream infrastructure along the Sand River.
- Liaise with climate change specialists on the sensitivity on the short-term rainfall depth during extreme events at Bantamsklip.
- Liaise with Eskom regarding the probability of exceedance events.
- Produce draft EIA hydrology report, including final updates for review.
- Workshop with project team.
- Incorporate all review comments into final EIA hydrology report.

11.6.6 MARINE PHYSICAL, WATER QUALITY, SEDIMENT TRANSPORT AND SHORELINE CHANGE IMPACT

Gap Analysis

Identified potential gaps in the information to make the requisite EIA specialist assessments include:

- Detailed Project Description: A key constraint identified in the present preliminary assessment is a sufficiently detailed project description to ensure sufficiently robust impact assessments to meet both EIA requirements and permitting requirements. This needs to be resolved before proceeding with the detailed specialist assessments for the EIA and subsequent permitting.
- NPP Capacity-specific Assessments: Whilst a number of modelling studies have been undertaken for the two sites, no studies have been undertaken for a 5 200 MWe NPP. There exists a possibility that detailed modelling assessments will be required for this specific NPP plant capacity for the preferred site the associated preferred infrastructure and the flow rates associated with the cooling water and desalination operations.
- Dredging and Dredge Spoil Disposal Activities: The excavation and dredging spoil disposal assessment has been undertaken with a reasonable due diligence. However, should the specific values to be disposed of offshore change significantly representative spoil disposal

modelling assessments may need to be repeated. The assessment of dredge spoil disposal to the St Francis beaches is likely to require a quantitative modelling assessment and will need to take into account existing beach nourishment and shoreline protection initiatives

- Site-specific Tsunami Risk Analyses: The tsunami risk analyses seemingly are site-specific, however, again it is likely that site specific assessments will need to be undertaken for the prevailing engineering designs at the selected site. This will need to include a more detailed evaluation of extreme events (e.g., run-up and set-down), potential climate-driven variability, as well as the quantification of any outstanding tsunamigenic sources not considered to date for Thyspunt.
- Climate Change: It is likely that updated information on climate change may need to be taken into account in the various assessments should the original assumptions prove not to be sufficiently conservative.
- Accidental Spills: Finally, the PPE for accidental spills have not been well developed, meaning that it is difficult to assess whether there are any significant gaps in the existing knowledge at the two sites.

Plan of Study

The key requirements of the specialist needing to be undertaken are as follows:

- Project Description and Development Phases: The EIA will consider all stages of the project, namely the construction, operation, and decommissioning phases, based on a sufficiently detailed project description. This requirement applies to both previous studies and all upcoming studies, particularly where gaps have been identified through the scoping process and issues raised by Interested and Affected Parties.
- Environmental Baselines: The environmental baselines will need to be updated for the preferred site using the data from the ongoing measurement programs at the site under consideration, with a specific requirement to refine site-specific sediment transport pathways as needed.
- Thresholds of Concern / Water Quality Guidelines: The same environmental data will be assessed to determine appropriate thresholds of concern, especially those applicable to sensitive marine habitats and species.
- Project / Site-Specific Marine Discharge Assessments: Based on an updated characterisation of cooling water volumes and desalination plant operations for a 5 200 MWe NPP and site specific optimised marine infrastructure, it is likely that a detailed modelling assessment will need to be undertaken for both the cooling water discharges and desalination discharges, based on an appropriate range of environmental conditions. This will need to include any co-discharges and any other waters released from the NPP site potentially affecting estuarine or marine waters, including and potential accidental spills.
- Project / Site specific Dredge Spoil Disposal Assessments: Should the beneficial use and / or dredge spoil disposal scenarios change substantively from those assessed in the Nuclear-1 EIA, it is possible that the dredge spoil disposal modelling will need to be repeated using an updated dredging and dredge spoil disposal description. However, this is only likely to be necessary should the material quantities be substantively increased (unlikely) or should the water quality guidelines become more restrictive (a possibility should the proposed updated South African Water Quality guidelines come into force during the assessment period). Nevertheless, if undertaken, included in such an assessment will need to be adequate consideration of:
 - beneficial use and disposal options

- impacts of marine infrastructure construction activities
- identified sand geohazards risks
- potential impacts on surf breaks
- St Francis Beach Nourishment and shoreline protection activities
- potential impacts on the Kromme Estuary

These assessments will all need to be integrated with Marine Ecology and related Specialist Studies

- Site-Specific Tsunami-Hazard-Assessment (THA): Mitigation of potential flooding impacts will need to be re-assessed based on an updated, site-specific tsunami hazard assessment (THA) and any modifications of the NPP site design to manage existing identified risk and include all outstanding tsunamigenic sources, especially the indicated higher risks for Thyspunt. This may need to include independent verification of cooling-water intake and safety-system resilience (IAEA SSG-18), following the updated THA.
- Combined Coastal Hazard Considerations: The EIA will consider relevant combinations of coastal hazard drivers (which may include extreme waves, storm surge, sea level rise, and tsunami-related mechanisms) to the extent necessary to inform conservative impact characterisation.
- Failure and Risk Scenarios: The EIA will consider, at an appropriate level of detail, credible failure scenarios (e.g. tunnel collapse, diffuser failure, cofferdam failure, accidental sediment release or storm interaction during construction) and their potential impacts. These are to be included for the construction, operation and decommission phase.
- Underwater Noise and Vibration: The EIA will consider the potential interaction between construction activities, including tunnelling, drilling, dredging or other seabed disturbance, and underwater noise or vibration effects, with the relevance and level of assessment informed by the refined construction methodology and input from marine ecology specialists. Operational noise or vibration associated with marine infrastructure will be considered where relevant to the assessment.
- Marine Access and Marine Traffic: The EIA will consider potential marine physical-environment interfaces associated with construction-phase marine traffic, temporary works areas, safety or exclusion zones, and, where relevant, operational marine access restrictions, insofar as these may affect coastal access, recreational marine users, navigation or other specialist assessments.
- Cumulative & Long-term effects: Cumulative effects and impact pathways will be identified and, together with potential, long-term effects incorporated into the appropriate specialist studies).

All assessments will need to take cognisance of the increasingly stringent permitting requirements that have come into force since the Nuclear-1 assessments were undertaken. Specifically, this is likely to include:

- a robust beneficial use assessment for the Dumping at Sea permit, and;
- possible updated water quality guidelines for the CWDP, should these come into force or be anticipated to come into force during the proposed Environmental Authorisation of the present NPP.

The scope of specialist assessments will remain commensurate with the level of project definition and engineering design available during the EIA phase. Where necessary, refinement of specialist

assessments will be informed by progressive clarification of the project description, in order to ensure adequacy for both EIA and permitting requirements. Where uncertainties remain, a precautionary and conservative assessment approach will be adopted, with results used to inform permit applications and subsequent detailed design, rather than to pre-empt final design decisions.

11.6.7 AGRICULTURAL IMPACT ASSESSMENT

In addition to fulfilling the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources*, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998), the EIA phase study will address the following issues raised by public comment on the draft scoping report:

- A comprehensive assessment of foot and mouth disease and biosecurity risks, including cumulative effects, will be included in the EIA phase Agricultural specialist study for both sites, with clear mitigation measures.
- The potential agricultural impacts associated with the required transmission lines will be taken into account in the assessment of cumulative impacts.
- the detail of the proposed substation footprint at the Thyspunt inland site will be assessed and the resultant loss of agricultural production land will be quantified.

Much of the public comment related to agriculture concerns broader economic issues that are beyond the scope and expertise of an agricultural impact assessment as required by NEMA. These issues will be addressed by the socio-economic specialist study. In addition, much of the comment relates to impacts on water availability, which will be more effectively addressed in the hydrology study.

11.6.8 GEOTECHNICAL

A detailed geotechnical assessment desktop study will include the following:

Geological and Geomorphology

- Literature reviews of available published and unpublished information including, but not limited to, geological data, geological maps, topographical maps, aerial images and any existing geotechnical investigation reports of the Thyspunt and Bantamsklip sites.
- Geotechnical Suitability – Evaluation of subsurface conditions, including thick unconsolidated coastal deposits, palaeovalleys, and folded geological formations, to determine their implications for foundation stability and constructability.
- Assessment of Faults and Fold Belt Structures – Detailed investigation of structural geology, including the influence of the Cape Fold Belt (or equivalent folded sequences), fault systems, and associated deformation features. This includes evaluation of structural controls on subsurface conditions, potential reactivation of faults, and implications for foundation integrity and seismic response.
- Seismic and Fault-Related Risks – Assessment of regional and site-specific seismicity, nearby fault structures, liquefaction potential, and associated ground response risks affecting long-term infrastructure safety.
- Earthquake and Multi-Hazard Risk Integration – Analysis of the interaction between seismic hazards and other environmental risks (e.g. Tsunamis, slope instability, foundation failure), with a focus on compounded risk scenarios.

- Tsunami and Coastal Geohazards – Investigation of tsunami risk (including outstanding studies), storm surge potential, coastal erosion processes, and the vulnerability of a low-elevation coastal site (~20 m above sea level).
- Geomorphological and Dune System Stability – Assessment of mobile dune systems, wetland seepages, and dynamic coastal processes that may affect infrastructure stability and long-term site resilience.
- Groundwater and Subsurface Complexity – Evaluation of groundwater conditions, including interactions with below-sea-level bedrock depressions and potential impacts on geotechnical behaviour.
- Adequacy of Existing Data and Studies – Review of current and historical datasets to determine whether assessments are based on sufficiently detailed, site-specific, and up-to-date information.
- Regulatory Compliance and Alignment – Consideration of requirements from relevant authorities (e.g. National Nuclear Regulator, Nuclear Installation Site Licence), including alignment with nuclear safety criteria and hazard assessment standards.
- Legacy Site Selection Assumptions – Reassessment of historical assumptions used to justify site suitability, particularly in light of updated geological and hazard information.
- Climate Change and Long-Term Environmental Risks – Evaluation of cumulative risks associated with sea-level rise, increased storm intensity, and long-term environmental uncertainty over the facility's design life.
- Engineering Feasibility and Mitigation Requirements – Determination of whether identified risks can be effectively mitigated through engineering solutions, and whether such measures are reasonable or indicative of inherent site constraints.
- Residual Risk and Site Acceptability – Identification of any remaining geological or geotechnical constraints that could materially affect safety, regulatory approval, or overall site suitability.
- Avoidance, Redesign or No-Go Consideration – Final determination of whether conditions warrant site avoidance, design modification, or a potential no-go decision based on unacceptable or unmitigable risks.

Geotechnical

A detailed geotechnical assessment that includes but is not limited to:

- Assessment of geotechnical evaluation criteria, including excavation conditions across the sites, engineering properties of the underlying geology, slope stability etc.
- Assess the structural integrity of the site taking into account the fault line activity, the Cape Fold Belt and the Table Mountain Group.
- Assess the retreating coastlines and implications of further excavations damaging the dune barrier.
- Ground Conditions and Subsurface Constraints – Clear identification and characterisation of subsurface conditions at Thyspunt and Bantamsklip, including palaeovalleys, unconsolidated sediments, variable stratigraphy, and complex dune-associated deposits, and how these influence engineering behaviour.
- Foundation Suitability and Bearing Capacity – Assessment of foundation conditions, including preliminary bearing capacity, settlement characteristics, and the suitability of founding levels (natural ground, bedrock or engineered fill) for safety-critical infrastructure.
- Structural Geology and Fault Influence – Consideration of the Kouga–Baviaanskloof fault system and Cape Fold Belt structures, including potential fault reactivation, secondary fracturing, and implications for seismic response and ground stability.

- Seismic–Geotechnical Interaction – Evaluation of the influence of seismicity on ground behaviour, including amplification effects, liquefaction potential, and implications for foundation performance under earthquake loading.
- Excavation and Earthworks Risks – Assessment of excavation feasibility, slope stability, temporary and permanent cut stability, and risks associated with large-scale earthworks for nuclear and support infrastructure.
- Liquefaction, Settlement, and Stability Risks – Determination of the potential for liquefaction, differential settlement, and slope instability, particularly in loose, saturated, or unconsolidated coastal deposits.
- Groundwater and Hydrogeological Interaction – Integrated assessment of groundwater conditions, including seep systems, aquifers, water table levels, and dewatering requirements, and their influence on geotechnical performance and excavation stability.
- Groundwater–Geotechnical Coupling – Explicit consideration of how subsurface disturbance may alter groundwater regimes and, in turn, affect soil behaviour, stability, constructability, and environmental sensitivity.
- Dune System Stability and Erosion Risk – Evaluation of dune mobility, erosion potential, and the effectiveness of dune barriers, including required protection and long-term resilience under coastal and climatic influences.
- Adequacy of Existing Site Investigations – Review of current and historical geotechnical data to determine whether sufficient, up-to-date, site-specific information exists to support defensible design and safety conclusions.
- Regulatory and Site Suitability Interface – Alignment with regulatory requirements and expectations for demonstrating geotechnical suitability, particularly for nuclear safety and zero-failure tolerance criteria.
- Residual Uncertainty and Data Gaps – Identification of uncertainties in subsurface conditions, groundwater behaviour, and hazard interpretation, and their implications for design confidence and risk.
- Engineering Feasibility and Demonstration of Suitability – Requirement to clearly demonstrate—rather than assume—that ground conditions can safely support the scale, lifespan, and critical nature of the proposed infrastructure.
- Impact on Site Suitability (Avoidance, Redesign, No-Go) – Final evaluation of whether any geotechnical constraint materially affects site suitability and whether mitigation is feasible, or if avoidance, redesign, or no-go decisions may be required.

Seismic Risk

- Assessment of the seismic activity at each site based on the geological activity in the area and also on the design related seismic safety aspects of nuclear power plants.
- Assessment of the seismic and fault-related risks at Thyspunt and Bantamsklip, including current existing technical basis using updated and site-specific evidence.
- Assessment of the seismic risk interfaces with the National Nuclear Regulator (NNR) and Nuclear Installation Site Licence (NISL) processes, and whether any residual seismic issue materially affects the acceptability of either site.
- Seismic Hazard Assessment – Evaluation of the regional and site-specific seismic hazard, including characterization of ground motion parameters such as peak ground acceleration (PGA), spectral acceleration, and return periods relevant to the design life of the infrastructure.

- Fault Identification and Characterisation – Investigation and mapping of known and potentially active faults within the study area, including their geometry, kinematics, activity status, and potential for surface rupture. A clear explanation of seismic hazard and fault-related risk at each site.
- Earthquake Analysis – Review of historical and instrumental earthquake records to determine the frequency, magnitude distribution, and spatial occurrence of seismic events affecting the sites.
- Evaluation of the relationship between identified seismic sources and potential earthquake impacts at the site, including the translation of seismic hazard into engineering risk. This includes consideration of ground shaking intensity, duration, and frequency content; potential for secondary effects such as liquefaction, slope instability, and differential settlement; and the implications of these factors on foundation performance, structural integrity, and long-term operational safety.
- Probabilistic Seismic Hazard Analysis (PSHA) and Modelling – Development and/or review of PSHA models to quantify seismic hazard in probabilistic terms, incorporating relevant seismic sources, attenuation relationships, and uncertainty ranges.
- Review of Historical Site-Selection Assumptions – Critical assessment of the assumptions and data used in previous site selection studies, including any outdated seismic interpretations or limitations in earlier analyses.
- Assessment of Existing Investigations – Compilation and evaluation of prior geotechnical, geological, and seismological investigations to determine their adequacy, consistency, and relevance to current project requirements.
- Regulatory and Compliance Interface – Alignment of the seismic assessment with applicable regulatory frameworks, standards, and guidelines (e.g. National nuclear, dam safety, or infrastructure design criteria), including engagement with relevant authorities.
- Residual Uncertainty Evaluation – Identification and documentation of uncertainties associated with seismic hazard characterisation, modelling assumptions, data gaps, and limitations, together with their implications for design and risk.
- Engineering and Planning Implications (Avoidance, Redesign, or No-Go) - Determination of whether identified seismic risks can be mitigated through design measures, require project redesign, or are of such significance that they may necessitate site avoidance or a no-go decision.
- Assessment of the legal Basis:
 - IAEA Safety Standards SSG-9 (Seismic Hazards in Site Evaluation for Nuclear Installations); IAEA
 - NS-R-3 (Site Evaluation for Nuclear Installations); NNR Act 47 of 1999 (site licensing prerequisites);
 - NEMA s.2(4)(viii) (precautionary principle).
- Review Probabilistic seismic hazard analyses (PSHA), conducted to IAEA SSG-9 standards and independently peer-reviewed for each site.

11.6.9 FAUNAL IMPACT ASSESSMENT

The EIA phase will build on the findings of the scoping phase and will address the remaining data gaps relevant to fauna, invertebrates, and the habitats they use. Comments received during scoping have informed the focus of the next phase, particularly in relation to sensitive habitat, habitat connectivity, disturbance pathways, SCCs, and cumulative impacts on faunal and invertebrate receptors. The following will be required during the EIA phase:

- Confirmation of the proposed layout, associated infrastructure and relevant project activities that may affect fauna, invertebrates, and the habitats they use. This must include sufficient detail on the permanent and temporary development footprint, access roads, fencing, lighting, laydown and working areas, and other activities relevant to habitat loss, habitat degradation, habitat fragmentation, disturbance, or mortality risk.
- Targeted follow-up work for invertebrates of concern, where required to address uncertainties identified during the scoping assessment. This may include additional field verification, seasonally appropriate survey effort where necessary, and refinement of habitat associations, likely occurrence, taxonomic status, or conservation importance, based on specialist opinion.
- Assessment of the proposed layout and associated infrastructure against the habitat sensitivities, species constraints and ecological linkages identified in this specialist study, in order to confirm the implications for fauna, invertebrates, and the habitats they use, and to identify any additional mitigation or management requirements, where necessary.
- Refinement of the impact assessment for fauna, invertebrates, and the habitats they use, including direct, indirect and cumulative impacts associated with habitat loss, habitat degradation, habitat fragmentation, reduced habitat connectivity, disturbance, and, where relevant, mortality risk during the construction, operational and decommissioning phases.
- Application of the mitigation hierarchy in the EIA phase, with priority given to the avoidance of sensitive habitat and important habitat linkages, followed by the minimisation of disturbance and fragmentation, and rehabilitation where feasible.
- Formulation of clear and auditable management and design requirements for inclusion in the EMP/ESMP and, where relevant, contractor specifications. This should include requirements relating to lighting, biosecurity, access and traffic management, fencing, disturbance, dust, and other construction or operational activities insofar as these may affect fauna, invertebrates, or the habitats they use.
- Refinement of impact significance ratings, mitigation measures and residual impact conclusions for fauna and invertebrates, informed by the more detailed EIA phase information and any layout refinements undertaken. Where significant residual impacts remain following avoidance and mitigation, these must be clearly identified and discussed.

Potential specialist input to the Biodiversity Offset Strategy

Where significant residual impacts on fauna, invertebrates, and the habitats they use remain after avoidance, minimisation, and rehabilitation measures have been applied, specialist input to the Biodiversity Offset Strategy may be required during the EIA phase. Any such input will be informed by the final biodiversity baseline and impact assessment findings and will be limited to those faunal and invertebrate receptors, and associated habitats, for which residual impacts are predicted and for which offsets may require consideration in terms of the applicable policy framework.

The specialist tasks that may be undertaken in support of the Biodiversity Offset Strategy include the following:

- Data review and consolidation: A desktop review and gap analysis of the relevant biodiversity baseline and impact assessment information available for the EIA phase, together with available relevant global, national, regional, and site-specific datasets, will be undertaken in order to identify faunal and invertebrate species of concern, and the habitats they use, for which significant residual impacts are predicted.
- Identification of priority faunal and invertebrate features for possible offset consideration:

- Priority receptors and habitats for which offsets may require consideration will be identified with reference to specialist opinion and the applicable offset policy framework. Criteria may include:
 - Natural or near-natural habitat;
 - Habitats of particular importance to species of conservation concern;
 - Habitat representativeness or uniqueness within the wider landscape;
 - Habitat resilience, including the ability of habitat to persist and maintain ecological function;
 - Habitat linkages and ecological corridors;
 - Statutory species protected in terms of national or international legislation, agreements, or conventions;
 - Species listed as Critically Endangered, Endangered, Vulnerable, or Near Threatened, where relevant;
 - Endemic or restricted-range species;
 - Migratory or congregatory species, where relevant;
 - CITES-listed species, where relevant;
 - Species of particular ecological importance, including those representative of sensitive faunal or invertebrate assemblages; and\
 - Species that are poorly known, newly described, or potentially new to science.
- Residual impact review and determination of possible offset requirements: Should significant residual impacts remain for faunal or invertebrate receptors, or the habitats on which they depend, the need for offsets will be evaluated with reference to the nature and extent of the residual impact and the applicable offset framework. Particular consideration will be given to residual impacts associated with permanent habitat loss, habitat fragmentation, loss of habitat connectivity, or significant post-mitigation impacts on species of conservation concern.
- Consideration of an appropriate offset metric: Where offsets are considered potentially applicable, an appropriate loss-gain metric will be identified for the relevant receptors and habitats, having regard to the National Biodiversity Offset Guideline and the characteristics of the study area. Where appropriate, this may include an area- and condition-based metric to inform the determination of no net loss and/or net gain targets.
- Preliminary specialist input to the Biodiversity Offset Report: Where required, the fauna and invertebrate specialist study will provide input to a preliminary Biodiversity Offset Report by:
 - Identifying the relevant faunal and invertebrate receptors and habitat features for which offsets may be required;
 - Informing the basis for no net loss (NNL) and/or net gain (NG) considerations, where applicable;
 - Identifying initial offset-related management and monitoring measures relevant to these receptors and habitats; and
 - Aligning such input, where relevant, with the project's operational and decommissioning phases.

Any specialist input to the Biodiversity Offset Strategy will build on the mitigation measures identified in the impact assessment and will be pitched at a level of detail appropriate to the EIA phase and any associated stakeholder engagement process.

11.6.9.1 EIA Phase Reporting

The following includes how the full EIA phase will be conducted:

Invertebrates

- Targeted follow-up work to resolve uncertain invertebrate taxonomy and conservation status, because these findings materially influence receptor significance, avoidance needs, and offset requirements. Given the invertebrate findings, a return to the site is essential for conducting more thorough surveys as part of the complete EIA.

Vertebrates and invertebrates

- Refinement of the impact assessment and mitigation;
- Discussions on offset and all that related to it, if any; and
- Final conclusion.

11.6.10 FLORA AND TERRESTRIAL BIODIVERSITY IMPACT

Terrestrial Biodiversity

The Terrestrial Biodiversity Specialist Study will assess the biodiversity characteristics, ecological sensitivity, conservation importance and development compatibility of the selected site proposed for the Eskom Nuclear Power Plant project. The study will specifically address concerns raised by I&APs during the Scoping Phase and also comply with the requirements of the Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020 for Terrestrial Biodiversity.

The objectives of the Terrestrial Biodiversity Study are proposed to:

- Identify and characterise terrestrial habitats and ecological systems occurring within the proposed development area and surrounding landscape.
- Assess the ecological condition, integrity and sensitivity of habitats, vegetation systems and terrestrial biodiversity features present within the study area.
- Identify areas of elevated biodiversity importance, including sensitive habitats, ecological corridors, Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), protected areas, and other biodiversity-priority landscapes.
- Assess the occurrence, habitat requirements and conservation significance of Species of Conservation Concern (SCC) and other notable biodiversity features, based on specialist flora and fauna investigations.
- Evaluate landscape connectivity and ecological functioning, including the role of the study area in maintaining habitat continuity, ecological processes and biodiversity resilience.
- Assess the potential direct, indirect and cumulative impacts of the proposed development on terrestrial biodiversity during construction, operation and decommissioning.
- Evaluate habitat loss, fragmentation, edge effects and ecological process disruption, including impacts extending beyond the direct development footprint.
- Assess disturbance pathways and invasive species risks associated with the proposed development and determine their potential influence on long-term biodiversity integrity.
- Determine the compatibility of the proposed development with the receiving terrestrial environment, taking into account habitat sensitivity, conservation importance and ecological functioning.
- Identify biodiversity-related constraints, avoidance areas and design considerations that should inform project planning and impact avoidance.

- Assess the effectiveness of proposed mitigation measures and evaluate the significance of residual impacts after mitigation.
- Determine whether any terrestrial biodiversity issue materially constrains site suitability, requires project redesign, or constitutes a potential no-go consideration.
- Assess confidence levels, uncertainties, assumptions and data limitations associated with the findings and evaluate how these influence the reliability of the assessment.
- Provide an integrated terrestrial biodiversity sensitivity assessment and site-suitability evaluation to support informed environmental decision-making.

Flora

The Flora Specialist Study will assess the botanical characteristics, ecological sensitivity, conservation importance and development compatibility of the selected site proposed for the Eskom Nuclear Power Plant project. The study will specifically address concerns raised by I&APs during the Scoping Phase and also comply with the requirements of the Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 1150 dated 30 October 2020 for Terrestrial Plant Species and in accordance with guidelines described in the latest version of the "Species Environmental Assessment Guidelines".

The objectives of the Flora Study are proposed to:

- Identify and map vegetation types, plant communities and habitat units occurring within the study area and surrounding landscape.
- Assess the ecological condition, conservation importance and sensitivity of vegetation systems in the study area.
- Identify Species of Conservation Concern, endemic, rare and protected plant species that occur in the study area.
- Evaluate the relationship between the site and the broader biodiversity-priority areas and conservation networks.
- Assess direct, indirect, cumulative and residual impacts on flora and ecological processes that support sensitive flora.
- Evaluate habitat loss, fragmentation and ecological process disruption expected to be associated with the proposed development.
- Assess invasive species risks and disturbance pathways.
- Determine whether flora-related constraints affect site suitability.
- Identify avoidance areas, design constraints and mitigation requirements.
- Assess confidence levels, uncertainties and data limitations..

11.6.11 AQUATIC BIODIVERSITY IMPACT

The following activities are assumed and recommended, at present, to inform the way forwards in this project:

- More detailed commentary around the findings and implications for wetland ecosystems (noting limitations and assumptions) of the previous detailed specialist monitoring programme carried out by SRK (2022-2013 for surface and groundwater systems and ongoing for groundwater);
- Input into multi-disciplinary EIA project team discussions, regarding the preferred development site, to take forward into the EIA phase – these discussions should consider the Thyspunt and Bantamsklip sites, as well as the need for consideration of alternative sites if necessary;

- More detailed information-gathering and on-site assessment of (inland) aquatic ecosystems on the selected site, resulting in compilation of a more detailed baseline report, for inclusion in the specialist EIA report. This study should include:
 - More details regarding national and provincial spatial biodiversity plans for aquatic ecosystems for the selected site;
 - Inclusion of data where wetland delineation has occurred, as per DWAF (2005 and 2008) protocols;
 - Updating of wet-health assessments for key wetlands on the selected site (drawing on the Macfarlane et al (2020) protocol);
- Expansion of reporting on site descriptions for the selected site, including water quality, soil, invertebrate and plant species data as available and drawing on the (current) 2026 Scoping Report inputs;
- Review / consideration of inputs from other biodiversity specialists as well as from the geomorphology, geohydrology and surface hydrology specialists; into the Scoping Phase report;
- Consideration of the findings of more recent studies of the Thyspunt dune systems and its associated geohydrology (e.g. Mohuba et al. 2020 and 2022) and the implications if any of these for aquatic ecosystems (rivers and wetlands)
- In the event that Thyspunt is the selected study area, the site must be revisited and the proposed access routes and transmission line servitudes (within the site) assessed on the ground, in detail, with discussion with road design engineers and other specialists engaged in this assessment;
- Inclusion of the Thyspunt site in the EIA going forwards would also mean that the Offset Calculator of Macfarlane et al (2017) would need to be considered, to quantify the degree to which conservation gains for wetlands outside of the development platform would indeed reasonably offset / compensate for losses or degradation of wetlands as a result of the proposed development;
- An interdisciplinary workshop, including Eskom design engineers, should be held during the EIA phase of the project, in order to unpack design details that could have a bearing on aquatic and other biodiversity concerns, and practical mitigation measures for these.

11.6.12 MARINE ECOLOGY ASSESSMENT

This provides the context and Plan of Study for the EIA phase of the proposed marine ecology Impact Assessment (MEIA). It follows the completion of the Scoping Phase, during which the project description, preliminary baseline environment, and key environmental issues were identified and evaluated. The Draft Scoping Report forms the basis for this Plan of Study and incorporates input received from authorities, Interested and Affected Parties (I&APs), the proponent, and the EIA specialist team, in accordance with the requirements of applicable environmental legislation and best practice guidelines.

The EIA phase will involve detailed specialist assessment of those potential marine ecological impacts identified as potentially significant during Scoping. This includes refinement of impact significance, further baseline characterisation where required, and the development of appropriate mitigation and management measures. The scope of work will be guided by regulatory requirements, including the applicable National Environmental Management Act (NEMA) EIA Regulations, as well as relevant marine and coastal environmental guidelines.

The MEIA will aim to:

- Provide a comprehensive assessment of the marine, coastal, and associated socio-ecological environments that may be affected by the proposed development.
- Assess potentially significant impacts on marine ecological receptors, including benthic habitats, pelagic ecosystems, fish communities, marine megafauna (including marine mammals, seabirds, and turtles where relevant), and ecosystem processes.
- Evaluate direct, indirect, cumulative, and residual impacts associated with all phases of the project, including construction, operation, and decommissioning where applicable.
- Identify, refine, and recommend appropriate mitigation and management measures to avoid, minimise, or offset potentially significant impacts.
- Support informed decision-making by environmental authorities through provision of robust scientific evidence and impact interpretation.
- Undertake a transparent and inclusive public participation process, ensuring that all I&APs are provided with adequate opportunity to contribute and that their issues and concerns are recorded and addressed.
- Alternatives identified during the Scoping Phase will also be assessed in detail where advised. These may include, but are not limited to:
 - preferred project footprint and layout alternatives.
 - Alternative design or engineering options that may influence the scale or nature of marine ecological impacts.
 - Alternative construction methods or timing scenarios, where these may reduce ecological sensitivity or exposure.
 - The “no-go” alternative, which provides a baseline against which potential impacts of the proposed development are assessed.

For timelines and ongoing consultation please refer to documentation provide by the EAP; WSP. For the assessment of potential impacts and mitigation measures methodology please refer to Section **Error! Reference source not found.**

The EIA Report will be compiled and integrated by the EIA project team and will synthesise all specialist inputs and available data.

A comprehensive Public Participation Process will be undertaken throughout the EIA phase. For further details please refer to WSP. Where required the marine specialist(s) will be in attendance at public meetings and forums to further engage on the issues raised.

11.6.13 AVIFAUNA

The avifaunal assessment in the EIA phase will build on the findings of the scoping phase and will address the remaining data gaps relevant to avifauna and the habitats and movement corridors they use. Comments received during scoping have informed the focus of the next phase, particularly in relation to sensitive habitat, ecological corridors, disturbance pathways, Species of Conservation Concern, and cumulative impacts on avifaunal receptors.

The following will be required during the EIA phase:

- Confirmation of the proposed layout, associated infrastructure, and relevant project activities that may affect avifauna. This must include sufficient detail on the permanent and temporary development footprint, above-ground infrastructure and technical components, access roads, fencing, lighting, laydown and working areas, and other activities relevant to habitat loss, habitat degradation, disturbance, displacement, collision risk, barrier effects, or mortality risk.

- Refined mapping and micro-siting to demonstrate how high-sensitivity avifaunal areas, including high-SEI areas and key functional corridors, particularly wetland-associated movement corridors, will be avoided, protected, or appropriately buffered.
- Assessment of the proposed layout and associated infrastructure against the avifaunal sensitivities, species constraints, and ecological linkages identified in the specialist study, in order to confirm the implications for avifauna and to identify any additional mitigation, monitoring, or management requirements.
- Refinement of the impact assessment for avifauna, including direct, indirect, and cumulative impacts associated with habitat loss, habitat degradation, disturbance, displacement, reduced connectivity, barrier effects, and, where relevant, collision or other mortality risks during the construction, operational, and decommissioning phases.
- Application of the mitigation hierarchy in the EIA phase, with priority given to the avoidance of sensitive avifaunal habitat and important movement corridors, followed by the minimisation of disturbance, fragmentation, and operational risks, and rehabilitation where feasible.
- Formulation of clear and auditable management and design requirements for inclusion in the EMP/ESMP and, where relevant, contractor specifications. This should include specific requirements relating to lighting, biosecurity, access and traffic management, disturbance control, fencing, dust, and other construction or operational activities insofar as these may affect avifauna.
- Engagement with BirdLife South Africa through a dedicated meeting to present the proposed approach, discuss key avifaunal sensitivities and mitigation measures, and ensure alignment and agreement, as far as reasonably possible, on the way forward for the EIA phase and any related mitigation or offset considerations.
- Potential input into the biodiversity offset strategy (as outlined in section 11.6.9).

Refinement of impact significance ratings, mitigation measures, and residual impact conclusions for avifauna, informed by the more detailed EIA-phase information, updated layout, and stakeholder engagement outcomes. Where significant residual impacts remain following avoidance and mitigation, these must be clearly identified and discussed.

11.6.14 SOCIAL IMPACT ASSESSMENT

The purpose of the Social Impact Assessment (SIA) during the Environmental Impact Assessment (EIA) phase is to identify, assess, and evaluate the potential social impacts associated with the proposed project. The SIA builds on the baseline information compiled during the Scoping Phase and provides a detailed assessment of the positive and negative social impacts that may arise during the project's construction, operation, and decommissioning phases.

The findings of the SIA will inform project decision-making, mitigation measures, and the development of management plans to avoid, minimise, or enhance social impacts. The revised Plan of Study has also been informed by stakeholder comments received during the Scoping Phase, which identified additional areas requiring more focused assessment, including labour influx, job-seeker migration, housing and affordability pressure, cost-of-living effects, municipal and public-service capacity, community safety, social conflict, vulnerable groups, tourism, fisheries, sense of place, benefit distribution, post-construction decline risk, and the long-term compatibility of the project with the receiving social environment.

The SIA will focus on social issues relevant to the project area of influence, including direct, indirect, and cumulative social impacts. The area of influence will consider nearby settlements, service

centres, transport routes, worker accommodation areas, tourism and recreation nodes, emergency planning interfaces, affected land uses, and other social receptors that may experience project-related social effects.

Key thematic areas to be assessed include, but are not limited to:

- Population changes and immigration
- Employment creation and labour dynamics
- Local economic development
- Land use, land access, and livelihoods
- Community health, safety, and security
- Pressure on social services and infrastructure
- Housing and accommodation
- Property-related perceptions and qualitative property market concerns
- Impacts on vulnerable groups
- Gender and youth considerations
- Community character, sense of place, social cohesion and way of life
- Tourism, recreation, coastal amenity and place-based social value
- Cultural landscape, local history and stakeholder-identified heritage-linked social values, including First Nations considerations where applicable
- Local economic structure, benefit distribution, cost-of-living pressure and affordability risks for existing residents
- Institutional capacity, public-service demand, policing, emergency response and administrative-service pressure
- Fisheries, particularly Chokka/ Squid, small-scale fisheries, fisheries-dependent livelihoods and related value-chain risks where linked to project impacts
- Post-construction decline, boom-bust effects, stranded accommodation or infrastructure, and transition risks after peak construction

The SIA will be undertaken in accordance with applicable national legislation, international best practice, and lender requirements, including:

- National Environmental Management Act (NEMA) and EIA Regulations
- Relevant sectoral legislation (e.g. labour, land, health and safety)
- International Finance Corporation (IFC) Performance Standards
- World Bank Environmental, Health and Safety (EHS) Guidelines
- Equator Principles (where applicable)

The SIA will describe the social baseline conditions within the project area of influence, drawing on:

- Secondary data (e.g. census data, municipal statistics, published reports)
- Information obtained during the Scoping Phase
- Stakeholder engagement outcomes
- Municipal planning information, specialist studies and locally relevant qualitative information where available
- Stakeholder evidence regarding local conditions, perceived risks, service pressure, seasonal population changes, tourism, fisheries and recreation use, affordability, public safety, institutional capacity and social vulnerabilities

Baseline conditions will include demographics, socioeconomic characteristics, service provision, employment, livelihoods, and social vulnerabilities. Where official data are outdated, incomplete or available only at a broad geographic scale, the SIA will clearly state the limitation and use reasonable triangulation with other available information.

The SIA will incorporate findings from the public participation process, including:

- Issues and concerns raised by Interested and Affected Parties (I&APs)
- Feedback from community meetings and engagements
- Inputs from local authorities, First Nations (where applicable), and civil society organisations
- Comments relating to labour influx, local employment realism, skills mismatch, housing and rental pressure, affordability, municipal service demand, institutional capacity, public safety, tourism, fisheries, sense of place, property-market concerns, vulnerable groups, social cohesion, post-construction decline and long-term land-use compatibility
- Stakeholder proposals for mitigation, monitoring and further investigation during the EIA phase.

Potential social impacts will be identified for each project phase:

- Construction
- Operation
- Decommissioning

Impacts will be assessed using the same impact assessment methodology used in the scoping phase, considering:

- Nature of the impact (positive or negative)
- Extent
- Duration
- Magnitude
- Likelihood
- Consequence
- Significance (before and after mitigation)

Both negative and positive impacts will be assessed.

Appropriate mitigation measures will be proposed to:

- Avoid impacts where possible
- Minimise or reduce negative impacts
- Enhance positive social outcomes
- Address stakeholder-identified concerns where these are linked to project-related social impacts
- Provide practical and monitorable measures that can be incorporated into the EMP or other relevant management plans

Mitigation measures will be aligned with the mitigation hierarchy and good international practice.

The SIA will identify residual social impacts remaining after the implementation of mitigation measures and assess their significance. Where residual impacts remain uncertain, significant, cumulative or dependent on future design, procurement, workforce accommodation, institutional arrangements, municipal capacity or authority coordination, this will be clearly stated

The SIA will inform the development of:

- Social management and monitoring measures
- Inputs into the Environmental Management Programme (EMPr)
- Indicators for monitoring social impacts over time
- Commitments or recommendations responding to stakeholder-identified social risks, where appropriate and within the scope of the EIA process, while distinguishing EIA mitigation from matters governed through procurement, municipal planning, policing, health, education or other institutional processes

The assessment will outline key assumptions, data gaps, and limitations encountered during the study. The SIA will conclude with a summary of key social risks, opportunities, and recommendations to support informed decision-making during the EIA phase. The conclusion will also indicate how the public participation process has shaped the final assessment focus; whether any stakeholder-identified issues require further investigation, monitoring or management; and where issues raised by stakeholders fall partly outside the scope of the EIA but should be considered through related project, municipal, procurement, labour, public-safety or governance processes.

11.6.15 ECONOMIC ASSESSMENT

The Economic Impact Assessment will assess the potential economic impacts of the proposed Nuclear Power Plant across the construction, operation, and decommissioning phases. The assessment will consider direct, indirect, and induced impacts at local, regional, and national levels, including employment creation, skills development, local procurement and localisation, contribution to GDP and GVA, fiscal impacts, and effects on existing economic sectors and SMMEs.

The assessment will draw on available secondary data, relevant policy and planning frameworks, and economy-wide analytical approaches. A Social Accounting Matrix-based Input-Output modelling framework will be used to quantify macroeconomic impacts and multiplier effects, including direct project expenditure, supply-chain impacts and induced household expenditure. Baseline economic conditions within the Project Area of Influence will be described to provide a reference for impact assessment.

The assessment will consider broad economic sectors including agriculture, manufacturing, construction, electricity and utilities, trade, transport and logistics, business and financial services, and community and government services. Where relevant, local economic sensitivities, dependencies and vulnerabilities identified through stakeholder engagement and other specialist studies will be considered qualitatively.

The assessment will recognise the limitations of economy-wide modelling in quantifying highly localised or perception-driven impacts, including individual property values, specific business impacts, destination image, tourism demand, fishing livelihoods, agricultural enterprises and market confidence. These matters will be considered, where relevant, through qualitative discussion and in conjunction with the findings of the relevant specialist studies, including the Tourism Impact Assessment and Social Impact Assessment.

A dedicated Cost-Benefit Analysis (CBA) will be undertaken to assess the economic desirability of the project by comparing the costs and benefits associated with the proposed development over its full lifecycle.

The CBA will provide an assessment of the extent to which the project generates net economic value to society and will consider the broader economic implications of the investment over the long term.

11.6.16 TOURISM ASSESSMENT

The Tourism Impact Assessment will assess the role and economic significance of tourism within the affected regional economy and the potential tourism-related impacts of the proposed Nuclear Power Plant and associated infrastructure.

The assessment will identify relevant tourism destination areas, including Cape St Francis, St Francis Bay, Jeffreys Bay and Oyster Bay, and will consider tourism demand, visitor flows, seasonal patterns, tourism supply, destination characteristics, tourism expenditure and links with supporting sectors such as accommodation, transport, food services, recreation and retail.

The Tourism Impact Assessment will be undertaken using a Tourism Satellite Account (TSA)-based framework embedded within a Social Accounting Matrix (SAM) Input-Output modelling system for the Eastern Cape. This combined approach ensures that tourism activity is measured in a manner consistent with national accounting standards while also allowing the wider economy-wide impacts of tourism expenditure to be quantified through established multiplier techniques. The assessment will focus on the following key components:

- Tourism Demand Analysis
- Tourism Supply and Destination Analysis
- Tourism Expenditure and Economic Contribution
- Sectoral Linkages

The Tourism Impact Assessment will not attempt to quantify individual property value changes, behavioural responses of specific tourists, or impacts on individual businesses. These matters may be discussed qualitatively where relevant and informed by stakeholder engagement and available evidence.

The findings of the Tourism Impact Assessment will be considered alongside the Economic Impact Assessment and Social Impact Assessment to provide an integrated understanding of potential socio-economic implications.

11.6.17 HERITAGE IMPACT ASSESSMENT

The results of the archaeological and palaeontological fieldwork, sampling programme and more recent site visits over the last 15 years have conclusively mapped and graded the heritage sensitivities for these two components of the heritage process. However, the cultural landscape elements present at both Thyspunt and Bantamsklip featured in Hart's 2012 assessments but have been expanded on in 2026 by Hearth Heritage in association with CTS Heritage. There are currently several unresolved legal issues pertaining to the Thyspunt site which is under a provisional protection notice in terms of S29 of the NHRA and this declaration specifically refers to Thyspunt as a 'cultural landscape' of national heritage significance. Unfortunately, this process has not been concluded by SAHRA and this leaves a level of ambiguity about the eventual outcome of the nomination process at Thyspunt. The scoping HIA has also revealed a series of cultural landscape sensitivities at Bantamsklip which require further interrogation and groundwork.

We therefore recommend that the cultural landscape specialist assessments at both sites (Bantamsklip and Thyspunt) be extended into the EIA phase and that these reports are peer-

reviewed before being submitted to Heritage Western Cape and SAHRA respectively for inclusion in the HIA at the EIA phase. SAHRA must also be consulted to discuss the Thyspunt nomination and what factors are being considered.

The South African Heritage Resources Agency (SAHRA) has provided an interim comment to the proposed development and requires peer reviews of the archaeological assessments as well as the cultural landscape reports compiled during the EIA phase. Furthermore, test excavations in areas not investigated by Hart et al in 2012 must be conducted during the EIA phase in areas where uncertainty remains about the extent of archaeological sites on the property. SAHRA also requires a maritime heritage specialist for potential impacts to shipwrecks and other underwater heritage resources.

The following recommendations are made at the scoping phase of the HIA which should be carried out at the EIA phase:

- The Cultural Landscape Studies Thyspunt must be expanded in order to provide enough time to engage with SAHRA and with the ECPHRA. Motivations for the nomination and boundary of the proposed NHS must be obtained and incorporated into the EIA phase for the Cultural Landscape Study to test whether the findings in the scoping phase still stand, should be reduced, or should be firmed up and expanded.
- Direct engagement with affected stakeholders and indigenous groups registered with an interest in the proposed development must take place with specific consideration of the anticipated heritage impacts.
- The Scoping HIA must be updated for the EIA phase to take the findings of the additional cultural landscape study into account, the Visual Impact Assessment, Social Impact Assessment as well as the public participation process.

Updated recommendations following meeting with SAHRA on 15th May 2026 and Scoping HIA PPP comments and feedback:

- The updated Cultural Landscape study should factor in two scenarios - Thyspunt as a finalised cultural landscape of Grade I National Heritage Site significance on the one hand; and Thyspunt as an undeclared area, managed by ECPHRA with sites of local heritage significance within its boundaries.
- The EIA Phase will deal only with Thyspunt and all references to Bantamsklip will be removed
- A Maritime and Underwater Cultural Heritage (MUCH) assessment will be conducted at Thyspunt to map out heritage resources (eg shipwrecks, fish traps) that may be impacted.
- Due to the high number of archaeological resources within the Thyspunt location, an archaeologist must be sourced to conduct a peer review in addition to the landscape specialist as part of the EIA phase
- A test excavation programme augmenting the test excavations by the ACO in 2012 will be conducted in the mid area based on the detailed layouts that the applicant will make available. The section 29 permit application will be updated accordingly that is currently in draft on SAHRIS.
- SAHRA's previous comments on the Hart (2012) HIA will be reviewed in detail in light of additional studies that have taken place
- Updated recommendations following the ECPHRA's response to the Notification of Intent to Develop for the areas outside of the S29 area (ie the HV Yard):
- Engagement with the ECPHRA must take place to clarify their reasoning for refusing to process the S38(8) application in terms of the steps outlined in S38(1) to S38(4)

- Further fieldwork (archaeology, palaeontology etc) is expected in areas under ECPHRA's jurisdiction in order to complete a separate HIA for the HV Yard component of the NPP project.

11.6.18 NOISE IMPACT ASSESSMENT

The Environmental Acoustic Impact Assessment for the project (preferred site only) as part of the EIA phase will comprise the following:

BASELINE MONITORING

- To quantify the existing baseline noise climate at the preferred site, baseline noise monitoring will be conducted, comprising the following:
 - Day- and night-time noise monitoring will be conducted at the identified nearest sensitive receptor locations. All sound level measurement procedures will be undertaken according to the relevant South African Code of Practice, SANS 10103:2008 as well as in line with the IFC EHS Guidelines for Noise.
 - Sound level measurements will be undertaken using a Type 1 Integrating Sound Level Meter. Monitoring will be conducted in fifteen-minute intervals, with the day-time monitoring occurring between 07:00 and 22:00, and the night-time monitoring between 22:00 and 07:00, as per the IFC Guidelines.
 - Monitored results will then be assessed against the relevant South Africa guideline rating levels. As discussed in Section 3, these guidelines are the most stringent when compared to the WHO and IFC guidelines and as such, to align with the IFC specifications, these will be applied for the assessment.

ACOUSTIC INVENTORY

A detailed inventory of all potential noise sources associated with the operational phase of the proposed Project will be developed and sound power levels for each of the sources will be sourced from the most applicable database, literature. Since the reactor technology will not be selected at this stage, a PPE approach has been followed and as such the inventory will assess the worst-case potential equipment. Alternatively, if specification and sound power level information is not available, a similar approach to the previous Noise Impact Assessment for the Nuclear-1 Project may be utilised. This included use of monitored data for the existing Koeberg Nuclear Power Station.

It is noted that only noise from the operational phase will be quantified. Construction phase and decommissioning phase noise will be assessed qualitatively, due to the erratic and transient nature of such phases. Based on public comments received, it is understood that construction traffic is a major concern. As such, a high-level acoustic model (using data from the Traffic Impact Assessment) will be executed to quantify impacts on receptors. On-site construction activities will be discussed qualitatively since detailed construction plans are yet to be established.

ACOUSTIC MODELLING

Environmental noise modelling will be conducted using the internationally accredited noise modelling software, CadnaA (Computer Aided Noise Abatement). The CadnaA software provides an integrated environment for noise predictions under varying scenarios and calculates the cumulative effects of various sources. The model uses ground elevations in the calculation of the noise levels in a grid and uses meteorological parameters that influence the propagation of noise. CadnaA has been utilised in many countries across the globe for the modelling of environmental noise and town planning. It is comprehensive software for 3-dimensional calculations, presentation, assessment and

prediction of environmental noise emitted from industrial plants, parking lots, roads, railway schemes or entire towns and urbanised areas.

The operational phase noise source inventory detailed above will be utilised as input for the CadnaA model. Gridded outputs from CadnaA will then be input into ArcGIS to provide a visual representation (isopleth output) of noise levels throughout the region. The noise contribution of the proposed Project to the existing noise levels (monitored data) will be calculated, with comparisons being made to relevant National guidelines.

ENVIRONMENTAL ACOUSTIC IMPACT ASSESSMENT REPORT

A detailed Environmental Acoustic Impact Assessment report will be provided detailing findings of the baseline assessment, noise modelling results and impacts, as well as detailed recommendations, including mitigation measures if deemed necessary. It is noted, that should Bantamsklip be selected as the preferred site, as per GNR 320 of NEMA, a noise compliance statement may be sufficient to address any noise impacts/concerns and as such the above methodology may not apply for the Environmental Acoustic Impact Assessment.

11.6.19 TOWN PLANNING

This ToR sets out the spatial-planning-related issues raised by the public during the Scoping Phase and the matters that the Spatial Planning Assessment is expected to address during the EIA phase for the proposed Eskom Nuclear Power Plant project.

During EIA phase there will be a conceptual layout of the facilities; although the regional and local spatial planning overview has already been concluded, for the next stage the existing assessment will be amplified with an assessment of the properties (cadastral context and zoning).

The public comments received to date asked that the Spatial Planning Assessment clearly show how the proposed development fits within surrounding land uses, strategic planning frameworks, municipal and provincial policies, settlement patterns and future development intent, what updated and site-specific evidence supports the conclusions, and whether any spatial-planning issue materially affects site suitability or requires avoidance, redesign or no-go treatment. In essence, a commentary on spatial compatibility.

Updated site-specific evidence does not form part of this assessment, as the EIA process is not a municipal planning process. The assessment slots into the current state of the municipal policy environment; the assessment's role is not to guide municipal planning.

The next phase will expand on, or reiterate, the topics of:

- land-use compatibility and zoning, addressing:
 - Concern that the proposed development may be incompatible with surrounding land uses and the existing character of the receiving area: a clear and site-specific explanation of current land uses, zoning and compatibility considerations.
 - Concern that zoning and land-use context should be treated as substantive indicators of suitability, not only as procedural matters to be addressed later: transparent discussion of how the proposed land use relates to surrounding uses and planning intent.
 - Concern that the spatial compatibility of a large nuclear facility with neighbouring uses requires clear and transparent explanation: an explanation whether land-use incompatibility materially constrains site suitability

- strategic and municipal planning alignment, addressing:
 - Concern that the project must be assessed in relation to municipal and provincial planning frameworks, strategic plans and broader development policy direction: clear treatment of municipal, provincial and strategic planning alignment where relevant.
 - Concern that references to planning alignment should be explicit and evidence-based rather than generic: explanation of how planning-framework consistency is assessed and interpreted.
 - Concern that inconsistency with relevant planning frameworks may materially affect the appropriateness of the proposed development: A study that explains whether planning misalignment materially affects overall project acceptability.
- regional growth and settlement patterns, addressing:
 - Concern that the project may influence or conflict with broader settlement patterns, growth trajectories and regional planning priorities: explicit treatment of settlement patterns, growth corridors and regional planning implications where relevant.
 - Concern that future development intent and strategic growth should be considered when judging spatial suitability: explanation of how wider spatial planning context is incorporated into the assessment.
 - Concern that the spatial significance of the project extends beyond the immediate footprint and should be interpreted regionally: A study that explains whether regional planning implications materially affect site suitability and significance.
- cumulative land-use conflict, addressing:
 - Concern that the project may contribute to cumulative land-use change, fragmentation and broader planning conflict over time: treatment of cumulative land-use change and planning conflict where relevant.
 - Concern that spatial impacts should not be considered in isolation where the project may drive wider transformation of the receiving area: explanation of how broader spatial transformation is evaluated.
 - Concern that cumulative planning implications should be explicitly addressed in the assessment: explanation of whether cumulative spatial change materially affects site suitability and residual risk.
- whether any spatial-planning issue remains fundamentally constraining. It had been raised that there was a concern regarding cascading levels of spatial plans not reflecting the proposed nuclear site at Thyspunt; this will be investigated in the EIA phase.

The scope of works does not include updated investigations for the reasons mentioned earlier, that this EIA process is not the legislative vehicle for updating municipal spatial planning.

Lastly, the TOR for the EIA phase includes the Decommissioning Phase.

11.6.20 VISUAL IMPACT ASSESSMENT

The significance of these high-level impacts must be further investigated and rated in the Assessment Phase of the ESIA using computer modelling techniques that establish visibility (viewshed analyses), and visual intrusion using simulations representative of project activities. The results of the I&AP process will also be known, which will establish receptor sensitivity to the project.

The following issues will be addressed:

- Establish/confirm public concern for the project, specifically as it concerns visual issues.

- Confirm the visibility and visual intrusion of project activities using computer modelling techniques (viewshed analyses and photomontage simulations).
- Establish specific management measures (mitigation) to reduce the anticipated impact of the project where appropriate once more detail becomes available.

11.6.21 HEALTH IMPACT ASSESSMENT

- Obtain modelled air concentrations of PM_{2.5}, expected in the identified receptor communities, from the final AQIA.
- Conduct the human health risk assessment for the health effects associated with PM_{2.5}, based on the methods presented in Section 6 of the study.
- Conduct the HIA by integrating the health baseline vulnerability data (Section 4) and the health risk results obtained in the previous step.
- Ideally, the modelled PM_{2.5} air concentration results provided to INFOTOX should specify concentrations at identified sensitive receptors, but a map of concentration isopleths is also needed to obtain likely concentrations in residential areas and at farmsteads. The format of such maps should allow the health risk assessors to identify residential areas below the concentration isopleths, so that air concentrations can be estimated and used to assess health risks to residents, even if specific sensitive receptors are not identified within a community.

11.6.22 CLIMATE CHANGE IMPACT ASSESSMENT

Climate Change Impact of the Project: GHG Inventory and Impact Assessment

During the EIA phase, Promethium Carbon will conduct a full CCIA to determine the extent to which the proposed NPP and its associated infrastructure may contribute to climate change. The assessment will be undertaken in accordance with NEMA, the Climate Change Act, and the principles established in relevant judicial precedent.

The GHG inventory will be developed in accordance with ISO 14064-2:2019, supported by the GHG Protocol: A Corporate Accounting and Reporting Standard where relevant. Emission factors and GWPs will be aligned, where applicable, with South Africa's DFFE Methodological Guidelines for Quantification of GHG Emissions. Although the DFFE-aligned GWPs are based on IPCC AR3 values, they provide the appropriate basis for consistency and comparability with South Africa's national GHG inventory, NDC targets and broader climate reporting obligations under the Paris Agreement.

In accordance with section 24 of NEMA, and consistent with the SCA 2025 judgment, the CCIA will:

- Quantify and characterise the Project's lifecycle GHG emissions across the construction and operation phases, consolidating emissions from all interdependent project components, including the nuclear power generation facilities, cooling-water intake and discharge infrastructure, seawater desalination and water storage facilities, wastewater treatment works, fuel and waste storage and management facilities, construction and access infrastructure, auxiliary and support facilities, and associated grid connection and project-enabling transmission infrastructure;
- Identify emission sources and develop a consolidated inventory of direct (Scope 1), energy-indirect (Scope 2) and other material indirect (Scope 3) emissions, with transparent boundary setting;

- Contextualise the Project's emissions within South Africa's national GHG inventory, emissions trajectory and carbon-budget framework, as well as relevant global temperature stabilisation pathways under the Paris Agreement;
- Provide transparent documentation of assumptions, emission factors, data sources, uncertainties and limitations, including fuel-cycle sourcing assumptions, construction material quantities, transport and logistics assumptions, desalination and auxiliary energy requirements, spent fuel management assumptions and decommissioning boundaries;
- Assess cumulative and lifecycle climate impacts at the project level, recognising the global and non-localised nature of GHG emissions and excluding unrelated regional emitters; and

In line with NEMA and applicable case law, the CCIA will assess the emissions and climate-change implications of reasonable and feasible alternatives identified through the EIA process, including the “no-go” alternative. For the purposes of the CCIA, the “no-go” alternative represents a zero project-emissions baseline, consistent with the project-level approach set out in ISO 14064-2:2019, against which emissions from the proposed Project and its alternatives will be assessed. The CCIA will not undertake system-wide electricity planning, national energy mix optimisation, or detailed techno-economic modelling of alternative technologies. Rather, it will provide a comparative, climate-focused evaluation of alternatives, supported by transparent assumptions and clearly stated limitations.

The CCIA will not select or recommend a preferred alternative, nor will it determine or justify the Project's overall need and desirability, which remain the responsibility of the competent authority under section 24O of NEMA. The CCIA will instead provide the climate-related information required to support informed, integrated decision-making.

Climate change resilience of the project: vulnerability and resilience assessment

Climate change is expected to influence the environmental conditions under which the proposed NPP and its associated infrastructure will be constructed and operated. Accordingly, climate change considerations for the Project extend beyond mitigation of emissions to include the assessment of physical climate risks, vulnerability and adaptive capacity over the Project's full lifecycle.

During the EIA phase, the CCIA will assess the vulnerability and resilience of the Project as an integrated development system, encompassing the nuclear power generation facilities, cooling-water infrastructure, desalination and water storage systems, wastewater treatment works, spent fuel storage and other fuel and waste management infrastructure, grid connection and transmission infrastructure, transport access, and other interdependent components.

The vulnerability and resilience assessment will consider relevant climate-related hazards, including but not limited to:

- Increasing ambient temperatures and heat extremes;
- Changes in rainfall patterns and drought risk;
- Extreme rainfall and flooding;
- Coastal processes, including sea-level rise, storm surge and coastal erosion;
- Sea surface temperature and projected intake seawater temperature conditions, where relevant to cooling-water intake conditions and operational resilience; and; and
- HILP events relevant to long-lived, safety-critical coastal infrastructure.

The assessment will address cumulative and interdependent climate risks across project components, recognising that disruptions to one element (e.g. cooling-water systems, electricity transmission, access routes or water supply) may have cascading implications for overall project resilience.

The EIA-phase CCIA will include:

- Reference to relevant international good practice frameworks for climate risk and resilience assessment;
- Consideration of relevant regional climate literature including potential hydroclimate tipping points and non-linear climate responses, where applicable at the project or regional scale;
- Identification of key climate-related impact pathways and sensitivities relevant to the project;
- Consideration of NNR Regulatory Guide RG-0011, Interim Guidance for the Siting of Nuclear Facilities, insofar as it is relevant to climate-related external events and long-term climatic conditions within the EIA-phase CCIA;
- Use of authoritative data sources, including national datasets such as the CSIR GreenBook, SANBI Climate Change Fact Sheets, and WRI Aqueduct, supplemented where appropriate by additional datasets;
- An evaluation of the project's exposure, sensitivity and adaptive capacity to projected climate risks;
- Clear articulation of assumptions, methodologies, uncertainties and limitations with a clear distinction between project-specific estimates and literature-derived reference values;
- Consideration of coastal and marine climate hazards, including sea-level rise, storm surge, wave climate, coastal erosion, compound coastal flooding, marine heatwaves and intake seawater temperature conditions, where relevant. The assessment will use appropriate and available climate and coastal information to evaluate the Project's exposure and vulnerability to these hazards. Relevant information may include South African coastal and oceanographic datasets, SAWS data where available, DFFE coastal guidance, tide-gauge and modelled data where available and IPCC-aligned climate scenario information. The assessment will be informed by the preferred site, project layout and available design information;
- Long-term climate projections aligned with the full project exposure window, including post-operational phases where relevant and consideration of climate risks affecting spent fuel storage and other post-operational infrastructure; and
- Identification of potential adaptation and resilience measures to reduce long-term climate-related risks, without pre-empting regulatory decisions or design outcomes.

The findings of the vulnerability and resilience assessment will inform the competent authority's consideration of the project's long-term viability and resilience in the context of a changing climate, while recognising that the determination of authorisation conditions, if any, remains the responsibility of the competent authority.

11.6.23 RADIOACTIVE WASTE AND TRANSPORT

The approach is broadly consistent with that applied in 2010 for a similar study (AquiSim, 2010). It will provide a critical and comprehensive overview of the following topics to address the scope of the study:

- Overview of the national and international regulatory framework for the management of radioactive waste, including the requirements and guidance provided through the IAEA safety standards on radioactive waste management.
- An overview and description of the radioactive waste management programme for an NPP.
- A description of how the different sources of radioactive waste are generated at an NPP.
- The approach followed to manage radioactive waste at the Koeberg Nuclear Power Station (KNPS).
- The International basis for the management of HLW, including an overview of the approach currently used in South Africa.
- Transport of radioactive waste, including nuclear fuel.

These topics will be addressed from a critical perspective, incorporating developments over the past 15 years and evaluating whether current national programmes remain aligned with international standards for radioactive waste management and transport. Within the S&EIR process, the aim is to clearly emphasise the importance of radioactive waste management, define unambiguous endpoints for each waste category, and ensure that these considerations are appropriately integrated into project decision-making.

This is particularly relevant to the long-term management of HLW, whether through extended storage or eventual disposal, and to a balanced evaluation of the advantages, limitations, and prerequisites associated with each option. Historically, HLW endpoint planning has not received sufficient prominence in nuclear power decision-making. Given that the development, licensing, and societal acceptance of an HLW disposal programme may take several decades—because it must satisfy both regulatory requirements and stakeholder expectations—this issue needs to be articulated more explicitly than previously. Accordingly, a dedicated section has been included to summarise the applicable IAEA safety standard requirements and guidance for radioactive waste management and transport.

11.6.24 NUCLEAR EMERGENCY PLANNING AND RESPONSE

- Provide an introductory description of the NPP proposed project and emergency planning objectives.
- The national legislative framework for nuclear emergency planning and response, and the IAEA standards and guidelines are described.
- The different nuclear Emergency Planning Zones (EPZ) and required actions that form the basis of a nuclear emergency response plan are described.
- The technical basis of site-specific EPZ considering Eskom proposed NPP reference technologies

NPP potential accidents that could result in damage to a nuclear reactor core and irradiated/spent fuel storage.

The likelihood of a radioactive release and potential off-site radiological consequences to members of the public and the environment.

- A description of the expected site EPZs is presented based on initial nuclear accident screening analyses for the Bantamsklip and Thyspunt sites.
- Provide an overview of site aspects at Bantamsklip and Thyspunt that may impact the feasibility of implementing effective emergency response measures e.g.:
 - Land-use.

- Population distribution.
- Infrastructure (transport and communication).
- Atmospheric dispersion potential at each site.
- Proximity to emergency Services; availability of local emergency response resources, such as fire departments and medical facilities.
- Identify external event hazards at each site (e.g. severe weather conditions) to be considered when developing emergency response plans.
- Provide an overview of the organisational structures in South Africa and IAEA for nuclear emergency response and their interaction.
- Describe the aspects of nuclear emergency response planning not yet in place at the sites and to be addressed prior to NPP operation.
- Provide a qualitative assessment of the degree of emergency plan feasibility.

11.6.25 TRAFFIC AND TRANSPORT IMPACT ASSESSMENT

- Confirm study area and critical intersections/links with the EAP and authorities.
- Undertake updated 12-hour and peak-period counts at priority intersections (including seasonal sensitivity where relevant).
- Develop construction traffic generation and assignment using Eskom estimates; conduct capacity analysis for AM/PM peaks and construction peaks.
- Design and test site access options to TRH 26, including turning lanes, channelisation and control (STOP/roundabout/signal as justified).
- Assess abnormal load routing: structure clearances, gradients, turn radii, pavement capacity; identify required temporary works or escorts; outline permitting process.
- Refine ETE modelling for emergency evacuation, considering network constraints and staged responses.
- Parking and on-site circulation planning for operational phase.
- Public transport integration: MBT stop locations/embayment's; pedestrian walkways/crossings and verge improvements on R330/R102.
- Construction Traffic Management Plan: haul routes, timing windows, flagging, work zone safety, communication and monitoring.
- Access route alternatives and no-go assessment as highlighted during the Draft Scoping Report public review period.
- Cumulative assessment of impacts associated with possible road infrastructure upgrades.
- Road safety audit for proposed upgrades and access schemes.
- Stakeholder engagement inputs with road authorities (SANRAL, Province), Kouga LM and emergency services.
- Reporting: Draft and Final TIA with drawings, mitigation plan and monitoring framework.

11.7 PEER REVIEW TERMS OF REFERENCE

The Specialist Peer Reviewer shall review the relevant specialist report(s) and confirm whether:

- Compliance with Terms of Reference
 - The study fully addresses the approved Terms of Reference
 - The scope is adequate to assess key issues identified during scoping
 - Any deviations from the ToR are justified and clearly explained

- Methodology and Data
 - The methodologies applied are appropriate, robust, and aligned with best practice
 - Assumptions are reasonable, clearly stated, and justified
 - Data sources are credible, sufficient, and up to date
 - Uncertainties and limitations are explicitly identified
- Impact Assessment
 - Impact identification is comprehensive (biophysical, social, economic)
 - Assessment considers all project phases (construction, operation, decommissioning)
 - Cumulative, indirect, and residual impacts are adequately addressed
 - Impact significance ratings are logically derived and consistent
- Mitigation and Management Measures
 - Mitigation measures follow the mitigation hierarchy (avoid, minimise, rehabilitate, offset)
 - Measures are feasible, effective, and clearly linked to identified impacts
 - Residual impacts are appropriately characterised
- Consideration of Alternatives
 - Reasonable and feasible alternatives are assessed
 - Comparative analysis is adequately substantiated
- Objectivity and Independence
 - The report is impartial and free from bias
 - Conclusions are evidence-based and supported by analysis

The peer review must explicitly evaluate objectivity and scientific credibility of the report. A formal letter from the peer reviewer must be submitted, confirming that they have reviewed the relevant assessment documentation and indicate their professional support for the preferred alternative identified in the EIA Report.

11.8 IMPACT ASSESSMENT METHODOLOGY

11.8.1 ASSESSMENT OF IMPACTS AND MITIGATION

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The methodology chosen for this project has been adapted from the “Draft Best Practice Guidelines for Implementing the Mitigation Hierarchy in South Africa” (February 2023) developed through a collaboration between the Endangered Wildlife Trust, BirdLife South Africa and Enviro-Insight, with funding from Rand Merchant Bank; and is intended to support improved implementation of the mitigation hierarchy by specialists, environmental assessment practitioners and developers

In the absence of clear Thresholds of Concern (ToC) and Limits of Acceptable Change (LAC) against which to evaluate the likely significance of impacts and risks, use of a risk-based approach is recommended (Figure 11-1), moderated by consideration of the potential for irreplaceable loss of resources and the need for a precautionary approach where consequences could be major and there is high uncertainty about impact predictions.

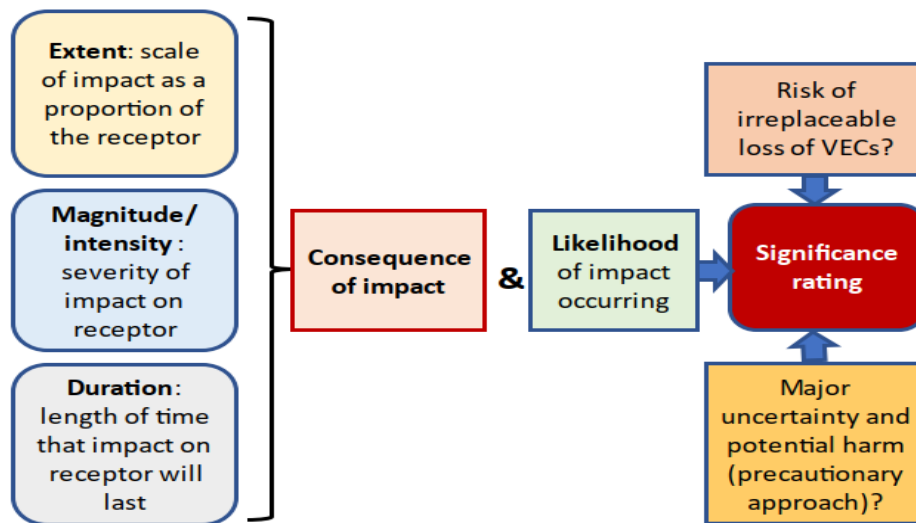


Figure 11-1 – Determining the significance of impacts in the absence of ToC and LAC

The ‘consequence’ adopts a proxy measure of the largest/highest rating from the assessment of likely magnitude against extent (i.e. at what spatial scale would an impact be measurable), and magnitude against duration (i.e. over what time period would an impact last). Ratings of magnitude, extent and duration should be scaled to reflect categories of seriousness, from the maximum of ‘very high’ (e.g. an extent which includes most or all of the spatial distribution of a threatened ecosystem or species, severe magnitude, and permanent duration) to ‘very low’ (e.g. very small area, negligible magnitude and ephemeral), as outlined in Table 11-6. Table 11-7 outlines the criteria for determining Duration, Extent and Magnitude.

Table 11-6 – Determining the Consequence rating of an impact (the higher of the magnitude/extent, or magnitude/duration scores)

THE HIGHER OF DURATION OR EXTENT SCORE						
Magnitude		Very Low	Low	Moderate	High	Very High
	Very High	Very High	Very High	Very High	Very High	Very High
	High	High	High	Very High	Very High	Very High
	Moderate	Moderate	Moderate	High	High	Very High
	Low	Low	Moderate	Moderate	High	Very High
	Very Low	Very Low	Low	Moderate	High	Very High

Table 11-7 – Criteria for Magnitude, Duration and Extent

CRITERIA	VERY LOW	LOW:	MEDIUM:	HIGH:	VERY HIGH:
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	No impact on processes	Slight impact on processes	Processes continue but in a modified way	Processes temporarily cease	Permanent cessation of processes

CRITERIA	VERY LOW	LOW:	MEDIUM:	HIGH:	VERY HIGH:
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite

The likelihood of the impact occurring would range from 'definite' to 'highly unlikely', drawing on experience from similar developments and activities in comparable environments. The combination of consequence and likelihood is used to determine a significance rating (Table 11.8), which is then modified to take into account uncertainty/confidence levels, and potential for irreplaceable loss of resources as described below. Once the impact significance rating has been determined, refer to the relevant implications for mitigation as outlined in Table 11-9.

Table 11-8 – Using Consequence and Likelihood to determine significance ratings

		LIKELIHOOD				
Consequence		Highly Unlikely	Unlikely but Possible	Likely	Highly likely	Definite
	Very High	Moderate	High	Very High	Very High	Very High
	High	Low	Moderate	High	Very High	Very High
	Moderate	Very Low	Low	Moderate	High	High
	Low	Very Low	Very Low	Low	Low	Low
	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low

Modifications to the significance rating should be made:

- Where there is a risk of irreplaceable loss of resources identified as VECs and high uncertainty in impact predictions, rating of significance should be set at 'very high', taking a risk-averse and cautious approach.
- Where there is high uncertainty in impact predictions (e.g. with unprecedented type of development, or where there are major gaps in baseline data) and a threat of significant negative impacts (e.g. major loss of ecological infrastructure and associated ecosystem services should a 'worst case' scenario develop), significance ratings should be increased, similarly taking a risk-averse and cautious approach.

Table 11-9 – Thresholds of Concern, impact significance, and the mitigation hierarchy

DESCRIPTION OF IMPACTS ABOVE THRESHOLDS OF CONCERN, AND LIMIT OF ACCEPTABLE CHANGE	IMPACT SIGNIFICANCE	IMPLICATIONS FOR MITIGATION
Negative impacts in this category cannot be remedied because of the irreplaceability of affected resources. Impacts in this category are of the highest magnitude, duration and/or extent, and would generally be unacceptable.	Very High	These impacts constitute a fatal flaw to the proposed development. The activity(ies) should not be authorised unless highly exceptional circumstances can be demonstrated.

DESCRIPTION OF IMPACTS ABOVE THRESHOLDS OF CONCERN, AND LIMIT OF ACCEPTABLE CHANGE	IMPACT SIGNIFICANCE	IMPLICATIONS FOR MITIGATION
		These negative impacts must be avoided or prevented, as they cannot be remedied; compensation or offsets would not be feasible.
Limit of Acceptable Change		
Negative impacts (including the proposed development's contribution to cumulative impacts) would result in environmental quality and/or Valued environmental components (VECs) approaching the Limit of Acceptable Change, and/or would be long term, of major concern, and/or be large scale/affect a large area.	High	Effort should be prioritised to avoid negative impacts by exploring spatial alternatives (location, siting, layout, routing options) and temporal avoidance. Minimisation of impacts is essential when further avoidance is demonstrably not feasible. Restoration of areas disturbed or degraded by the proposed development must be undertaken. Where residual negative impacts of 'high' significance remain, biodiversity offsets/compensation must be provided.
Threshold of major concern		
Negative impacts in this category could mean a deterioration in environmental quality or VECs. Negative impacts are of some concern, could endure in the medium to long term, and/or affect a considerable area.	Moderate	Effort should be made to avoid negative impacts by exploring spatial alternatives, design, technology, temporal and operational alternatives. Minimisation of impacts is essential, when further is demonstrably not feasible. Restoration of areas disturbed or degraded by the proposed development must be undertaken. Where residual negative impacts of 'medium' significance remain, biodiversity offsets/compensation must be provided.
Threshold of Potential Concern		
Negative impacts in this category could lead to some localised and minor deterioration in environmental quality in the short term, but affected components are not considered to be VECs.	Low	The focus is on avoidance and minimisation of impacts as far as possible. Rehabilitation/restoration would minimise residual negative impacts.

DESCRIPTION OF IMPACTS ABOVE THRESHOLDS OF CONCERN, AND LIMIT OF ACCEPTABLE CHANGE	IMPACT SIGNIFICANCE	IMPLICATIONS FOR MITIGATION
		Biodiversity offsets or compensation would not be required.
Threshold of Low Concern		
Negative impacts in this category affect highly modified areas not considered to be VECs.	Very Low	The focus would be on seeking opportunities to rehabilitate/restore degraded areas and improve ecological infrastructure (as an enhancement measure, rather than to mitigate negative impacts). Biodiversity offsets or compensation would not be required.
Threshold of negligible concern		

11.8.1.1 Impact Mitigation

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in **Figure 2-3** below.

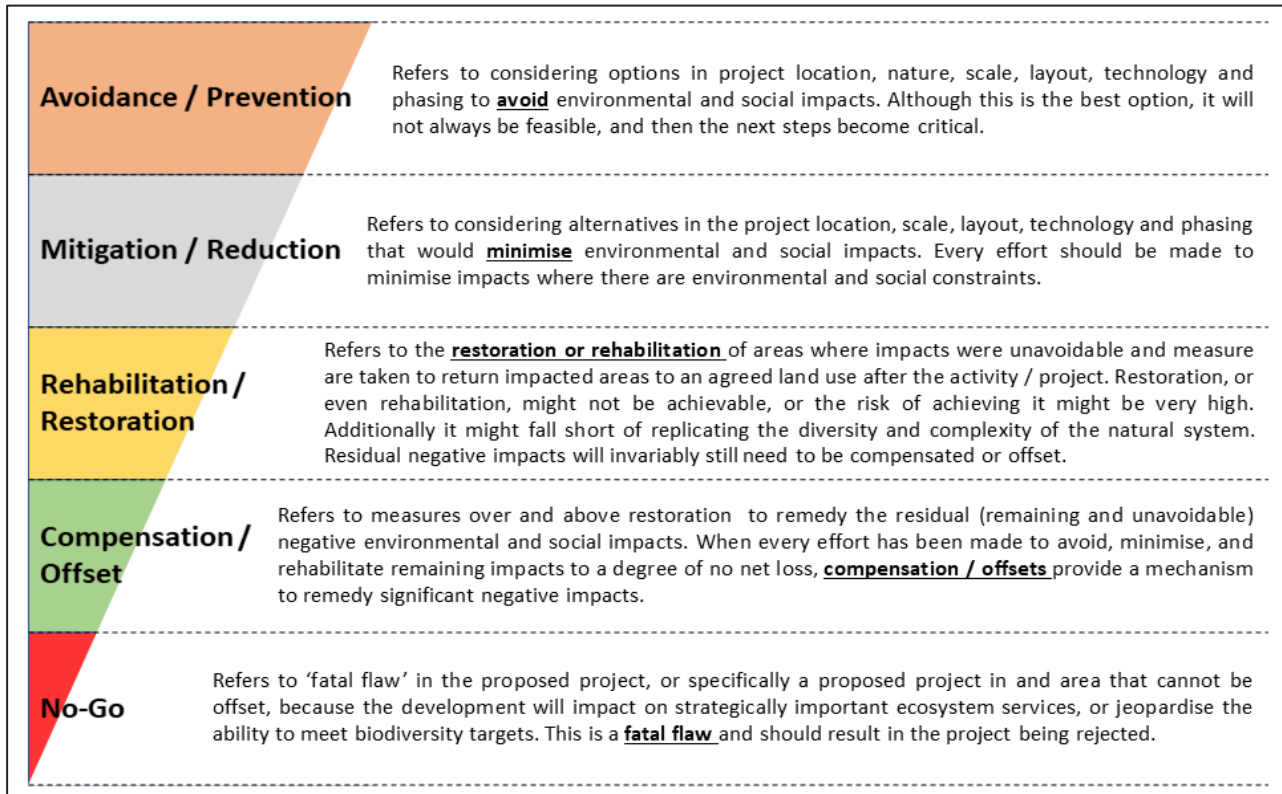


Figure 11-2 – Mitigation Sequence/Hierarchy

The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

11.9 ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Once the FSR has been approved the proposed project will proceed into detailed EIA phase, which involves the detailed specialist investigations.

WSP will produce a Draft EIA Report after the completion of the required specialist studies. The Draft EIAR will provide an assessment of all the identified key issues and associated impacts from the Scoping phase. All requirements as contemplated in the EIA Regulations, 2014 (GNR 982, as amended) will be included in the Draft EIAR.

The Draft EIAR will contain, inter alia, the following:

- Details of the EAP who prepared the report and the expertise of the EAP to carry out the S&EIR process, including a curriculum vitae;

- The location of the activity, including the 21 digit Surveyor General code of each cadastral land parcel, where available, the physical address and farm name; and the coordinates of the boundary of the property or properties;
- A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale;
- A description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the associated structures and infrastructure related to the proposed project;
- A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;
- A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;
- A motivation for the preferred development footprint within the approved site;
- A full description of the process followed to reach the proposed development footprint within the approved site;
- Details of the public participation process undertaken;
- A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
- The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts;
- The methodology used in determining and ranking of potential environmental impacts and risks;
- Positive and negative impacts;
- An assessment of each identified potentially significant impact and risk;
- The possible mitigation measures that could be applied;
- An environmental impact statement;
- A description of any assumptions, uncertainties and gaps in knowledge;
- A reasoned opinion as to whether the proposed activity should or should not be authorised;
- An undertaking under oath or affirmation by the EAP; and
- An EMPr.

11.10 STAKEHOLDER AND AUTHORITY ENGAGEMENT

Public participation during the EIA phase revolves around the review of the environmental impact assessment findings, which will be presented in the Draft EIA Report. All stakeholders will be notified of the progress to date and availability of the Draft EIA Report, via mail, email and/or SMS. A legislated period of 30 consecutive days will be allowed for public comment. It is noted that a request to extend the public review period will be submitted to the DFFE. I&APs will be notified of the extension timeframe should it be approved by the CA.

Reports will be made available in the following way:

- Distribution for comment at central public places, which were used during the Scoping phase;
- The document will be made available to download from the WSP and Datafree websites; and
- Copies of CDs will be made available on request.

The EIA phase will provide the following information to I&APs:

- Initial Site Plan;
- Alternatives;
- A description of activities and operations to be undertaken;
- Baseline information;
- Specialist studies;
- Impact assessment; and
- Management measures.

The information outlined above will be presented in one or more of the following:

- Notifications;
- EIA Report; and
- EMPr.

All comments received during the EIA phase will be recorded in the Comments and Responses table within the SER, which will be included in the draft and final EIA Reports. The final EIA Report will incorporate public comment received on the Draft EIA Report and will be made available for public review with hard copies distributed mainly to the authorities and key stakeholders.

All stakeholders will receive a letter notifying them of the authority's decision.

12 CONCLUSION AND WAY FORWARD

This FSR contains:

- A description of the existing and proposed activities;
- A description of the alternatives considered to date;
- An outline of the proposed process to be followed;
- Information on the EAP and stakeholders who have chosen to participate in the project;
- An outline of the environment in which the project falls;
- Information on the potential environmental impacts to be studied in more detail during the EIAR phase of the project;
- A discussion non the alternatives to be assessed in the EIA phase; and
- Information on the proposed specialist studies to be undertaken during the EIA phase, updated in response to the comments received.

A number of potential environmental impacts have been identified as requiring more in-depth investigation and the identification of detailed mitigation measures. Therefore, a detailed EIA is required to be undertaken in order to provide an assessment of these potential impacts and recommend appropriate mitigation measures. All specialist studies and identified mitigations will be assessed, verified and ground-truthed during the EIA phase.

The recommendation of this report is that detailed specialist studies as outlined in **Section 11.6** are undertaken.

All issues and comments submitted to WSP to date have been incorporated in the CRR of the PPR (**Appendix B**).

The DSR was made available for review from **01 April 2026 – 29 May 2026**. Furthermore, several public meetings were held during the public review period. All issues and comments submitted to WSP during the public review and raised at the public meetings have been incorporated in the CRR of the PPR and included in the Final Scoping Report (**Appendix B**).

If you have any further enquiries, please feel free to contact:

WSP Group Africa (Pty) Ltd

Public Participation Office

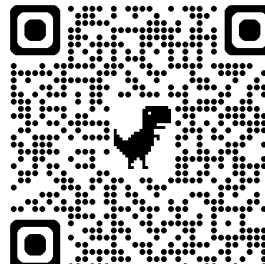
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