

EXECUTIVE SUMMARY:

COASTAL WATERS DISCHARGE PERMIT APPLICATION FOR THE EXISTING DISCHARGE VIA THE COOLING WATER OUTLET BASIN TO THE SURF ZONE, AT THE KOEBERG NUCLEAR POWER STATION

February 2025

DFFE: OCEANS and COASTS Ref Number: 2012/011/WC/Koeberg Power Station

1 INTRODUCTION

An application in terms of Section 69 of the National Environmental Management: Integrated Coastal Management Act (NEM: ICMA), Act 24 of 2008 for a Coastal Waters Discharge Permit (CWDP) has been lodged by Eskom for the discharge emanating from the the Koeberg Nuclear Power Station (KNPS).

The discharge activity is associated with the operation of the power station, which utilises large volumes of seawater for cooling purposes. In addition to the cooling water discharge, industrial and domestic effluent is produced and is discharged along with the cooling water via the Koeberg Cooling Water Outlet basin (KCWOB), which is situated south of the Koeberg Cooling Water Intake Basin (KCWIB) (Figure 1).

The KNPS has an existing statutory approval for the discharge activity. Through the promulgation of the NEM: ICMA in 2008, this Act has since repealed those provisions in terms of marine discharges, and the KNPS is therefore required to apply for a CWDP in terms of the NEM:ICMA. A technical assessment report has been drafted and supporting specialist studies have been conducted in support of this application.

See page v for details on how you can participate in the process.

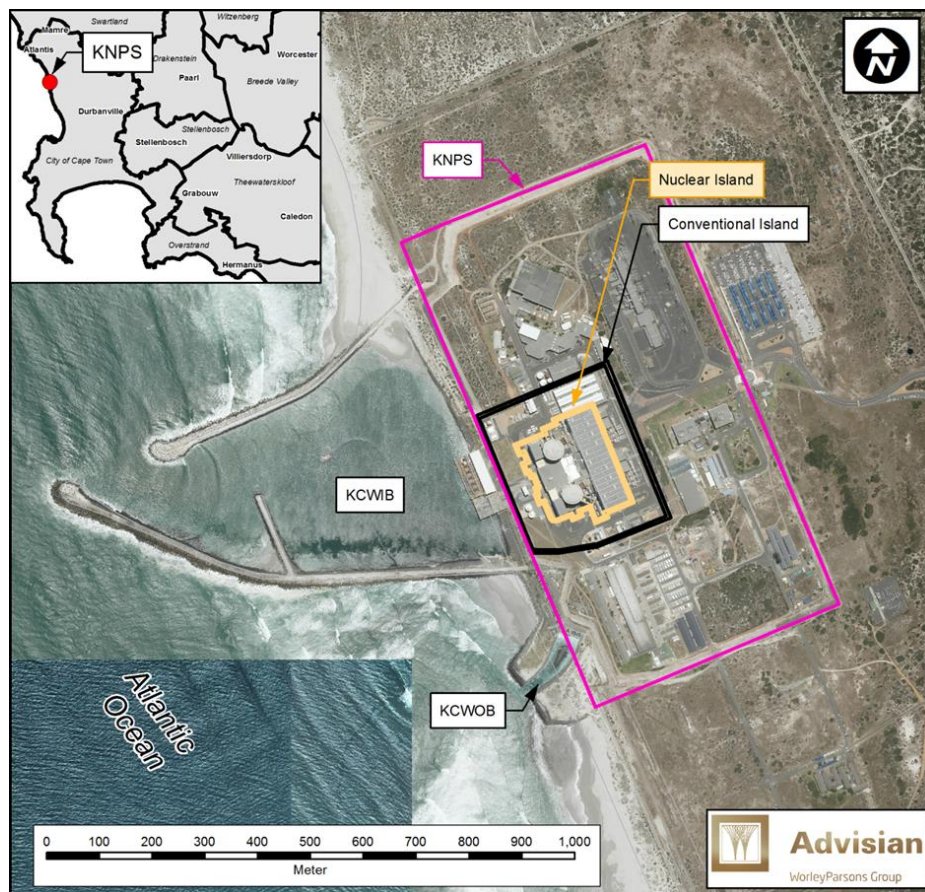


Figure 1: Locality Map

2 GOVERNANCE FRAMEWORK

The KNPS has an existing statutory approval for the discharge activity (Permit 853N) in terms of the Water Act (WA), Act 54 of 1956. This authorisation was issued on 17 July 1985 by the Department of Water Affairs, who at the time was the Competent Authority responsible for the governance of coastal water discharge under the relevant WA.

In terms of the transitional provisions of the National Water Act (NWA), Act 36 of 1998, the 853N permit is an existing lawful use and therefore valid in terms of this Act.

In 2008, the NEM: ICMA was promulgated in order to improve the conservation and sustainable management of the South African coastal environment. The NEM: ICMA has since repealed the provisions in the NWA in terms of marine discharges, and thus the administrative duties pertinent to this activity lie with the Department of Forestry, Fisheries and the Environment: Oceans and Coasts (referred to as DFFE). In light of the relevant statute change, the KNPS is required to apply for a Coastal Waters Discharge Permit in terms of the NEM: ICMA, Section 69.

Section 69(3) of the said Act, states *“Any person who wishes to discharge effluent into coastal waters in circumstances that are not authorised under a general authorisation referred to in subsection (2) must apply to the Department for a coastal water discharge permit.”*

The definition of effluent (as per the Act) is the following: (a) any liquid discharged into the coastal environment as waste, and includes any substance dissolved or suspended in the liquid; or (b) liquid which is of a different temperature from the receiving body of water. In this instance the KNPS triggers the threshold both in terms of discharge and characterisation of the effluent.

The scope of this application is only limited to the effluent discharge activity for non-radioactive liquid substances. The KNPS has the necessary statutory approvals for the discharge of radioactive liquid releases, as well as the approvals required in terms of the Seashore Act, Act No. 21 of 1935.

3 CWDP APPLICATION PROCESS

This CWDP application has been prepared using the following guidance documents:

- Assessment Framework for the Management of Effluent from Land Based Sources Discharged to the Marine Environment (DEA, 2015);
- Generic Assessment Criteria for Coastal Waters Discharge Permits (DEA, 2014); and
- Guideline on Public Participation Requirements for a Coastal Waters Discharge Permit Application (DEA, 2014).

The above-mentioned guideline documents define the approach to the CWDP application process and the associated public participation process. See Figure 2 for a simplified flow diagram of the proposed CWDP process.

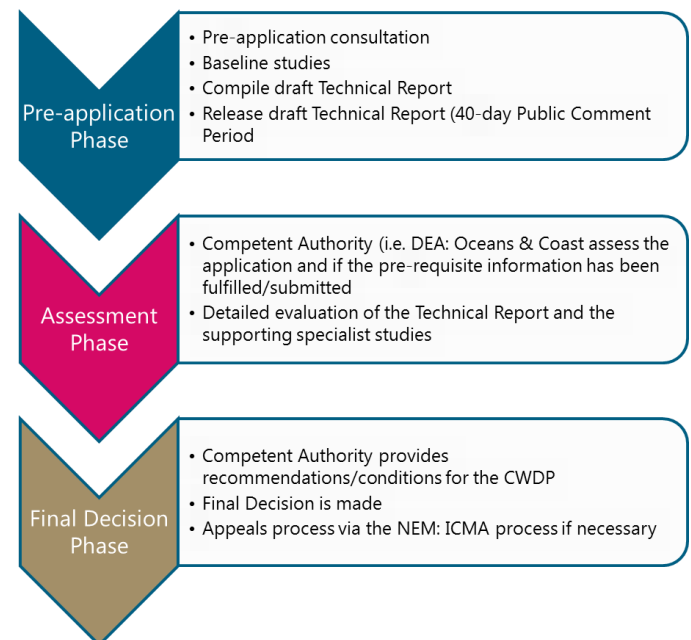


Figure 2: Simplified CWDP Process

The objectives of the Public Participation Process are the following:

- To identify and notify the relevant Interested and Affected Parties of the proposed project;
- To address any environmental or social concerns and issues which may arise as a result of the proposed project;
- To provide stakeholders the opportunity to voice any concern related to the project; and
- To provide stakeholders the opportunity to review and provide feedback on the specialist studies to ensure that the identified issues are adequately and suitably addressed.

Once the public participation process (PPP) has been completed, all the comments and concerns will be addressed and a summary PPP report will be submitted to the DFFE for final review and approval.

4 DESCRIPTION OF THE SITE AND ENVIRONMENT

The KNPS is located on Farm Duynfontyn No. 1552, approximately 30 km north of Cape Town, near Melkbosstrand on the West Coast of South Africa. Access to the KNPS is via the R27 which runs along the property's eastern boundary or alternatively via Otto du Plessis Drive.

The KNPS is situated in an area near the southern limit of the relatively uniform Namaqua marine biogeographic region. This area is dominated by the cold Benguela current system, in which the upwelling of cool nutrient rich waters results in high biological productivity. However, this coast is characterised by low species richness and low endemism. There are no identified areas of special conservation for marine mammals, invertebrates or fish within the immediate vicinity of the KNPS.

The two 900 MW nuclear reactors apply the direct or once-through cooling water system, where cooling water is drawn from the Atlantic Ocean, passed through the various industrial processes on site and returned to the sea with a temperature ~11°C above that abstracted.

The discharge is via the Koeberg Cooling Water Outlet Basin (KCWOB), which is situated in the southwestern portion of the property. The KCWOB consists of a concrete channel approximately 150 m long initiating on land and discharging into the sea at a depth of approximately -2 m CD. The design of the channel and the magnitude of the effluent discharged (~86 m³/s) inhibit the flow of ambient seawater back into the KCWOB, and therefore the discharge location is considered to be at the end of the channel. The coordinates of the discharge location are 33°40'50.18"S 18°25'50.45"E (GCP).

5 NEED AND DESIRABILITY OF THE EFFLUENT DISCHARGE

The KNPS has been in commercial operation since 1984. The disposal of land-derived effluent into coastal waters was previously authorised by the Water Act of 1956 and this water use is an existing lawful use in terms of the National Water Act, 36 of 1998 (NWA).

With the promulgation of the NEM:IMCA, this Act has since repealed the NWA and as such a Coastal Waters Discharge Permit (CWDP) is required by the KNPS. It is understood that the intention of the CWDP

is to replace the marine discharge requirements that exist under the NWA; however the discharge operations at the KNPS have been in compliance with the existing water permit and exemption recognised by the NWA.

6 ALTERNATIVES

Disposal options which avoid the need to discharge effluent to the coastal environment are limited due to the volume of waste water generated by the cooling water systems and the chemical composition of the water.

Alternative one: The effluent could theoretically be discharged to a sewer and treated at a municipal Waste Water Treatment Works (WWTW); however the large volume of cooling water abstracted from the sea is very saline and is not suitable for discharge into a water resource or a municipal WWTW.

Further to this, the effluent generated on site consists of concentrated waste products and is not best practice to re-use or to discharge to a water resource or municipal WWTW. In fact it is best practice to rather discharge the concentrated effluent along with the cooling water discharge into the sea which essentially dilutes the concentration to dosage levels safe for members of the public, workers, plants and animals.

Alternative two: *In situ* disposal method option includes the treatment of the effluent at the KNPS WWTW and final discharge via irrigation on the property. However; this would require the existing WWTW capacity to be upgraded to accommodate effluent volumes and in addition a desalination plant be constructed to remove the salt content of the water for irrigation purposes, again this option would be prohibitively expensive taking into consideration the remaining lifespan of the plant.

No-go Alternative: Entails not granting the CWDP for marine discharge. This alternative would mean the closure of the plant, as the discharge is associated with the operation of the power station. In light of the current South African energy crises this alternative is not an option as the KNPS plays an important role in supplementing the national grid with power. The cumulative impacts of this alternative would lead to loss of economic growth in the country due to unstable power supply and the loss of jobs not only at the KNPS but within the broader market as well.

7 STAKEHOLDER ENGAGEMENT

Stakeholder engagement forms a key component of the CWDP process and is being undertaken in accordance with the guideline document on Public Participation Requirements for a Coastal Waters Discharge Permit Application (DEA, 2014).

The historical stakeholder engagement activities are summarised in Table 1.

Relevant local, provincial and national authorities, conservation bodies, local forums and surrounding landowners and occupants have been notified of the CWDP application process and the release of the Draft Technical Report for review and comment.

Table 1: Historical stakeholder engagement during Pre-Application and Scoping Phases

Activity	Date
Pre-Application Phase	
Advertise release of CWDP Application and Technical Report and commencement of I&AP registration	18 - 27 May 2016
Public review and comment period	27 May – 27 July 2016
Public Safety Information Forum Meeting Presentation	23 June 2016
February 2019 Addendum	From 25 February 2019
November 2019 Addendum	From 15 November 2019

Following submission of the Application Form to the DFFE, the Technical Report, addressed issues raised during the Pre-Application Phase was submitted. Since then due to time that has elapsed, the DFFE has requested another round of PPP.

8 POTENTIAL IMPACTS

The impacts of marine discharge activity are mostly linked to the sensitivity of the receiving environment and proximity of receptors, the potential risks in an abnormal discharge and stakeholders' perceptions.

Based on the above considerations as well as the professional experience of the Environmental Assessment Team, the following potential negative

impacts and potential benefits have been identified.

The effects of entrainment on marine biota – The abstraction of large volumes of cooling water may potentially impact pelagic organisms which are entrained within the cooling water systems.

The effects of the effluent discharge on the receiving environment (Temperature) – The primary purpose of the cooling water abstracted is to act as a heat exchanger. The discharged water is therefore ~11 degrees Celsius higher than the abstracted water.

This type of discharge may generate chronic level effects on biota such as alterations in growth, metabolism, reproductions, production, and/or influence ecosystem level processes through e.g. alterations of the amount of oxygen dissolved in sea water.

The effects of the effluent discharge on the receiving environment (Total Residual Oxidant) – Dosing of the cooling water is essential to the maintenance of the KNPS. The buildup of biofouling could reduce the overall efficiency of the plant, which may lead to an increase in environmental impacts such as the generation of radioactive waste, for every unit of electricity produced. However chlorine (or any of its primary derivatives) is naturally toxic to marine organisms.

The effects of the effluent discharge on the receiving environment (Phosphates) – Phosphate is an industrial effluent constituent which potentially has negative effects on phytoplankton production, as nitrogen is a limiting nutrient in the southern Benguela ecoregion.

The effects of the effluent discharge on the receiving environment (Hydrazine) – Kelp sporophytes which are located on rocky/reef substrata in the shallow subtidal zone of in the receiving water body are specifically vulnerable to the toxicity effects caused by hydrazine.

The effects of the effluent discharge on the receiving environment (Build-up of Heavy Metal Concentrations in Deposition Areas) – The KNPS effluent discharge contains very low concentrations of heavy metals. Dissolved heavy metals can adsorb to suspended inorganic and organic particles in the water column and find their way to the seabed through sedimentation. Over time, sediment heavy metal concentrations in these depositional areas can build up through continued supply, such as may be from a continuously operating discharge, e.g. the KNPS, and local remineralisation of organic matter and associated biogeochemical processes. This can generate heavy metal concentrations approaching those considered to cause toxicity effects in benthos with ecological consequences of modification to benthic communities.

9 PLAN OF STUDY FOR THE IMPACT ASSESSMENT

To address the potential issues and impacts identified thus far, the following **specialist studies** are proposed:

- Marine Ecology Specialist Study; and
- Dispersion Modelling Specialist Study.

Specialists will be required to provide detailed baseline information and to identify and assess the potential impacts of the effluent discharge within their particular field of study. Studies are to be conducted as per the guideline document *Generic Assessment Criteria for Coastal Waters Discharge Permits* (DEA, 2014). In addition, specialists will be required to identify practicable mitigation and optimisation measures to avoid or minimise potential negative impacts and/or enhance any benefits.

Once specialist studies have been completed, the results will be collated into the Technical Report.

The CWDP Application and the supporting Technical Report will be released for public comment through notifications to Interested and Affected Parties (I&APs). Key authorities will also be consulted as part of the process.

All comments received will be incorporated into a Comments and Responses Summary which will be submitted to the DFFE for their consideration in decision-making.

HOW CAN YOU PARTICIPATE IN THE EIA PROCESS?

The CWDP Application and the supporting Technical Report is not a final report and can be amended based on comments received from stakeholders. Stakeholders are therefore urged to participate:

REVIEW THE REPORT

Copies of the CWDP Application and the supporting Technical Report are available for public review at the following locations:

- Koeberg Public Library, Duynefontein;
- Wesfleur and Avondale Public Libraries and Thusong Service Centre, Atlantis;
- KNPS Visitors Centre; and
- Eskom's website below:

<https://www.eskom.co.za/eskom-divisions/gx/koeberg-long-term-outage/PAIA/>

REGISTER OR PROVIDE YOUR OPINION

Register or send written comment to:

Deon Jeannes

Eskom

Private bag X10, KERNKRAG 7440

Tel: + 27 21 550 5027

Email: jeannesD@eskom.co.za

Comments must reach Eskom **no later than 16 April 2025**

I&APs are invited to comment, and/or to register on the project database. I&APs must provide their comments together with their name, contact details (preferred method of notification, e.g. email), and an indication of any direct business, financial, personal or other interest which they have in the application, to the contact person below, by 16 April 2025.

Relevant Organs of State have been automatically registered as stakeholders. According to the EIA Regulations, 2014 all other **persons must request in writing to be placed on the register, submit written comments or attend meetings in order to be registered as stakeholders** and be included in future communication for the project.

