MARINE INTAKE AND OUTFALL INFRASTRUCTURE SERVITUDE PROJECT, ZONE 10, COEGA SEZ, EASTERN CAPE PROVINCE, SOUTH AFRICA

MARINE INTAKE AND OUTFALL INFRASTRUCTURE SERVITUDE PROJECT – ENVIRONMENTAL SCOPING REPORT
DEFF REFERENCE NUMBER: 14/12/16/3/3/2/2036

FINAL

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TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES

LIST OF ABBREVIATIONS

ADZ	Aquaculture Development Zone
BID	Background Information Document
CBAs	Critical Biodiversity Areas
CD	Chart Datum
CDC	Coega Development Corporation
CES	Coastal and Environmental Services
CITES	Convention on International Trade in Endangered Species
COD	Chemical Oxygen Demand
CPP	Coastal Public Property
CWDP	Coastal Waters Discharge Permit
dB	Decibel
DAFF	Department of Agriculture, Forestry and Fisheries
DCP	Dynamic Cone Penetrometer
DEA	Department of Environmental Affairs
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DEFF	Department of Environment, Forestry and Fisheries
DFP	Development Framework Plan
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
DWAF	Department of Water Affairs and Forestry
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act
ECBCP	Eastern Cape Biodiversity Conservation Plan
ECDOH	Eastern Cape Department of Health
EEIA	Environmental Economic Impact Assessment
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EMS	Environmental Management Systems
ELC	Environmental Liaison Committee
G2P	Gas to Power
GAENP	Greater Addo Elephant National Park
GDP	Gross Domestic Product
GN	Government Notice
GRP	Glass-fibre Reinforced Plastic

GoSA	Government of South Africa
HIV	Human Immunodeficiency Virus
IBA	Important Bird Area
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature
IRT	Issues and Response Trail
KPI	Key Performance Indicators
LED	Local Economic Development
LNG	Liquefied Natural Gas
MPA	Marine Protected Area
MOSS	Metropolitan Open Space System
MSDF	Metropolitan Spatial Development Framework
MSL	Mean Sea Level
MW	MegaWatt
NEMA	National Environmental Management Act
NEM:BA	National Environmental Management: Biodiversity Act
NGO	Non-Governmental Organisations
NMBM	Nelson Mandela Bay Municipality
NEM:ICMA	National Environmental Management: Integrated Coastal Management Act
NFEPA	National Freshwater Ecosystems Priority Areas
NPAES	National Protection Expansion Strategy
NSBA	National Spatial Biodiversity Assessment
NSDP	Government's National Spatial Development Perspective
NWA	National Water Act
OC	Oceans and Coasts
OSMP	Open Space Management Plan
PGDP	Provincial Growth and Development Plan
PNCO	Provincial Nature Conservation Ordinance PNCO
PoS	Plan of Study
PPP	Public Participation Process
PSU	Practical Salinity Unit
QDS	Quarter Degree Square
SABAP	Southern African Bird Atlas Project
SABS	South African Bureau of Standards
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SCC	Species of Conservation Concern
SANS	South African National Standards
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SEZ	Special Economic Zone
STEP	Subtropical Thicket Ecosystem Project
SKEP	Succulent Karoo Ecosystem Programme
TB	Tuberculosis
TBM	Tunnel Boring Machine
TLB	Tractor-Loader Backhoe
TOPS	Threatened or Protected Species
TOR	Terms of Reference
TPNA	Southern African Bird Atlas Project
UHIA	Underwater Heritage Impact Assessment
WWTW	Wastewater Treatment Works

PROJECT SUMMARY

INTRODUCTION AND BACKGROUND

Background: The purpose of the marine intake and outfall infrastructure and servitudes project is to enable the provisioning of seawater to various industries within the Coega SEZ (aquaculture, power provision and seawater desalination plant) via a number of seawater intakes; and to discharge treated effluents into the marine environment. Infrastructure related to this project needs to be constructed along the coast adjacent to the Coega SEZ.

Need and Desirability: The rationale for the project is to develop a common user servitude for the establishment of infrastructure required for the abstraction of seawater from the marine environment, and the discharge of effluents. The primary need for the abstraction of seawater is to facilitate the co-ordinated development of infrastructure for a number of possible investors in the Coega SEZ that would require seawater in their processes. Having the appropriate infrastructure available to investors will enhance the attractiveness of the Coega SEZ as an investment destination and, therefore, improve investment attractiveness. To reduce cumulative impacts it is preferable for the SEZ to have dedicated servitudes for the placement of infrastructure needed for the abstraction of seawater and discharge of treated effluent to the marine environment, rather than each industry establishing its own set of infrastructure. This approach also has economic benefits by confining the placement of infrastructure to dedicated areas with the potential for shared infrastructure, thereby reducing costs. The largest volumes of seawater are required for the cooling of two proposed 1,000 MW water-cooled power plants in Zone 10 of the SEZ, which will enable the CDC to provide tenants with a secure access to energy and contributes to the overall energy security of South Africa.

The establishment of a desalination plant will allow the CDC to provide tenants with secure access to fresh water, thereby improving its value proposition as a world-class investment location and reducing the demand on the NMBM to provide the required amount of fresh water for CDC tenants and industry within the SEZ. The establishment of an Aquaculture Development Zone (ADZ) within Zone 10 of the Coega SEZ has been in planning for a number of years. The ADZ will provide significant employment opportunities estimated at over 5000 people in the long-term. Accessing seawater for land-based marine aquaculture is essential for the ADZ.

The NMBM currently does not have the capacity to provide sanitation services to all its residents. The recent upgrade of the Fishwater Flats WWTW, as well as the additional capacity and infrastructure currently being constructed at the Driftsands WWTW, as well as additional sewage capacity is required within the NMBM. This will require the discharge of larger volumes of treated effluent.

PROJECT DECRIPTION

Seawater Abstraction Servitudes: The need for marine seawater abstraction servitudes are driven by the water requirements for the following proposed Coega SEZ industries:

- Cooling water for two (2) 1000 MW LNG power stations (EIA currently in progress).
- Land based abalone and finfish aquaculture (42,370 tonnes / year). (EA received 7th of February 2018).
- Desalination plant (maximum capacity of 60 Ml / day). (EA received as part of the authorisation for the ADZ on the 7th of February 2018).

The following maximum seawater intake requirements are projected:

Purpose	Worse case intake flow rates
Cooling Water: Once-Through Cooling	14.70 m^3/sec
Cooling Water: Wet Mechanical Draft Cooling	0.42 m^3/sec
Aquaculture flow through system for abalone	5.00 m^3/sec
Aquaculture recirculation system for finfish	0.94 m^3/sec
Seawater Desalination Plant	2.03 m^3/sec
Total	**23.09 m^3/sec**

Two seawater abstraction servitudes will be required:

(1) Inside the Port of Ngqura for the Once-through and Wet Mechanical power station cooling water requirements; and
(2) East of the Port of Ngqura to meet the more specific water quality requirements of the aquaculture industries, and for desalination.

The following types of seawater abstraction technologies will be located within the servitudes:

- Abstraction basin with concrete intake channels (within the Port);
- Abstraction pipeline and intake jetty (within the Port);
- Seawater abstraction pipelines;
- Vertical beach wells;
- Onshore pump stations and screening facility; and
- WEROP wave pumps.

Effluent Discharge Servitudes: The need for the marine effluent discharge servitudes is mostly driven by a corresponding need of the respective Coega SEZ industries to return mostly seawater effluent used for cooling water and aquaculture, back into the offshore marine environment. Other additional effluent streams include wastewater from the Coega WWTW, brine from the desalination plant and stormwater. The position of the discharge servitudes, depth of discharge, and design of discharge infrastructure has been determined by a dispersion modelling process and engineering studies.

The following **maximum** effluent discharge requirements are projected:

PURPOSE	TYPE OF EFFLUENT	WORSE CASE DISCHARGE FLOW RATES
Cooling water: once-through cooling	Seawater at 28°C and 35 ppt	14.70 m^3/sec
Cooling water: wet mechanical cooling	Seawater at 23°C and 53 ppt	0.30 m^3/sec
Aquaculture flow through system for abalone	Seawater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD.	5.00 m^3/sec
Aquaculture recirculation system for finfish	Seawater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD.	0.94 m^3/sec
Desalination brine	Brine at 60 ppt	1.22 m^3/sec
Wastewater	Treated domestic and industrial waste water with projected concentrations of ammonia, nitrate, nitrite, TSS, COD, salinity heavy metals and E.coli	0.93 + 0.46 m^3/sec
Stormwater	Rainwater	Uncertain
TOTAL		**23.55 m^3/sec**

The following technologies will be implemented to discharge the various effluent streams from the various proposed land-based uses into the sea.

- Tunnel discharge;
- Pipeline discharge;
- Surf zone discharge; and
- Beach discharge (for storm water).

SEAWATER INTAKE ALTERNATIVES

The preferred alternatives for both seawater intake and effluent discharge servitudes was based on a high-levelled impact risk assessment process.

Impact risk assessment for alternative intake locations: A high-levelled risk assessment was conducted to assess the six (6) potential seawater intake servitude locations. The following list of environmental, social and economic impacts or risks were identified and considered with respect to determining the preferred seawater intake locations.

- Geographical location;
- Physical conditions (e.g. water quality);
- Terrestrial ecology;
- Marine ecology;
- Social;
- Socio-economic;
- Economic;
- Heritage & cultural;
- Technical;
- Climate change mitigation; and
- Climate change adaptation.

The risks were also considered with respect to the design, construction operation and decommissioning project phases and took into consideration the impact assessment and mitigation hierarchy, including:

- The nature of potential impacts including significance, consequence, extent, duration and probability; and
- Reversible, irreplaceable loss, can be avoided, managed or mitigated.

Preferred* seawater intake servitude *alternatives: The following table provides a summary of the preferred seawater intake servitude alternatives, which includes two separate servitudes which will be assessed in the EIA. No other alternatives will be assessed (except for the no-go alternative), since there are no other reasonable and feasible alternatives.

Alternative category	**Preferred alternative**	
Servitude	**Intake servitude 1**	**Intake servitude 2**
Activity	• Abstraction of seawater from the sea for Once-Through and Wet Mechanical Cooling of power stations.	• Abstraction of seawater from the sea for land-based aquaculture and desalination.
Broad geographical location	• Cooling water intake servitude inside the Port located at the root of the eastern breakwater as indicated in PRDW map (Figure 2.18).	• Combined aquaculture and desalination water intake servitude located east of the Port as indicated in PRDW map (Figure 2.18).
Specific location	• Servitude radius of 100 m and a depth of -6 m CD.	• Servitude width of 200 m to a distance of 600 m offshore and a depth of -10 m CD.

Alternative category	Preferred alternative	
Design and Technology	• Once-Through Cooling water intake basin with four concrete channels each 3.5 m wide. • Wet Mechanical Cooling water intake jetty with a 710 mm HDPE pipe.	• Desalination – up to three 1,000 mm diameter HDPE intake pipes; • Aquaculture – up to three 1,600 mm diameter pipeline tunnels; • Vertical beach wells; • WEROP wave pumps; and • Stormwater gabions.

Activity Alternatives – The project is to establish marine intake servitudes alongside the Coega SEZ for the maximum seawater abstraction requirements listed above. Alternative activities other than the establishment of a marine intake servitude for abstracting seawater from the ocean are not considered to be reasonable or feasible.

Location Alternatives – Two separate seawater intake servitudes will be constructed at the following preferred locations:

- Intake servitude 1: Seawater for Once-Through Cooling and Wet Mechanical Cooling located inside the Port (for cooling water only) with a servitude radius of 100 m; and
- Intake servitude 2: Seawater for aquaculture and desalination located to the east of the Port of Ngqura. (for combined aquaculture and desalination) with a servitude width of 200 m to a distance of 600 m offshore, and to a depth of -10 m CD.

***Design and technology*:**

- **All** feasible seawater intake infrastructure design and technology options (i.e. intake basin, pipeline, jetty, WEROP wave pumps, pipeline tunnel and vertical beach wells) are preferred. Consequently, impacts relating to **all** the maximum intake design and technology options will be assessed in the EIA.

EFFLUENT DISCHARGE ALTERNATIVES

A same high-levelled risk assessment procedure described above was also conducted to assess the three (3) broad potential seawater discharge servitudes locations:

- West of the Port;
- Within the Port; and
- East of the Port.

A detailed environmental economic assessment and climate change impacts assessment will be provided in the EIA phase comparing the discharge of effluent to the west of the Port with discharges to the east of the Port. However, preliminary projections for the return of only the Once-Through cooling water a distance of about 12 km from Zone 10S and 10N east of the Port via the N2 to the west of the Port, would incur additional capital and operating costs of over R 5.8 billion over the 20 year life of the project with associated additional greenhouse gas emissions of 1,8 million tCO_2e compared with discharging to the east of the Port.

Preferred alternative effluent discharge servitudes: The following table provides a summary of the preferred alternative effluent discharge servitudes (made up of three servitudes) that will be assessed in the EIA. No other alternatives will be assessed except for the no-go alternative, since there are no other reasonable and feasible alternatives.

Alternative category	Preferred alternative		
Servitude	**Discharge servitude 1**	**Discharge servitude 2**	**Discharge servitude 3**
Activity	Discharge of Once-Through and Wet Mechanical cooling water effluent totalling 15.0 m^3/sec, back into the sea.	Discharge of finfish aquaculture recirculation system effluent (0.94 m^3/sec), brine (1.22 m^3/sec), treated wastewater (1.4 m^3/sec) in three separate pipelines, and stormwater, into the sea.	Discharge of abalone aquaculture flow-through effluent (5.0 m^3/sec) and stormwater, into the sea.
Geographical location	East of the Port of Ngqura, as indicated in PRDW map (Figure 2.18).	East of the Port of Ngqura, as indicated in PRDW map (Figure 2.18).	East of the Port of Ngqura, as indicated in PRDW map (Figure 2.18).
Specific location	Servitude of 200 m width to -11 m CD, 650 m offshore	Servitude of 200 m width with: • Brine discharge to -13.5 m CD, 1,000 m offshore. • Finfish aquaculture discharge to -16 m CD, 1,500 m offshore. • Wastewater from phase 2 of the WWTW to -20 m CD, 3,000 m offshore.	Servitude of 200 m width along the shoreline.
Design and layout	Tunnel with diameter of up to 3,000 mm.	Pipelines including: • Brine – 700 mm diameter HDPE pipe; • Finfish – 700 mm diameter HDPE pipe; • Wastewater – up to 700 mm diameter HDPE pipe. Stormwater gabion system.	Beach pipeline – 1,600 mm diameter HDPE pipe. Stormwater gabion system.

APPROACH TO THE EIA

The development of the project concept has been an iterative process over a period of more than 5 years. The main informants of the design concept have included:

- CES 2015, Feasibility Study for the Development of an Aquaculture Development Zone in the Coega IDZ (Now SEZ).
- PRDW 2016, Coega Aquaculture Development Seawater Intake & Outfall Study, Concept Design Report.
- Mott McDonald 2016, Coega IDZ, Probable Power Plant Configurations.
- PRDW, 2017, Marine Pipeline Servitude for the Coega IDZ: Specialist Marine Modelling Study and Effluent Dispersion.
- Ethical Exchange 2017, Coega Land-Based Aquaculture Development Zone (ADZ) Final Environmental Impact Report.
- Carnegie Energy 2019, MEMO: Technical Inputs to Coega Gas to Power EIA Scoping Report.
- PRDW 2020, Marine Pipeline Project for the Coega SEZ, Marine Effluent Dispersion Modelling.
- Lwandle 2020, Marine Pipeline Project for the Coega SEZ, Marine Ecological Assessment.
- WSP 2020, Techno-economic Assessment: Cooling Options for the Coega SEZ Gas-to-Power Project Report.
- SRK 2020, Proposed Coega 1000 MW Gas-to-Power Plant – Zone 10 South and Zone 10 North. Draft Scoping Reports.

- Coega IDZ Stormwater Management Plan.
- Various meetings and workshops.

This report is the first of a number of reports that will be produced during the EIA process. In addition, a Public Participation Process (PPP) has been undertaken in accordance with Sections 39-44 of the Regulations, which outline the requirements for a successful PPP.

BASELINE ENVIRONMENT

The Port of Ngqura and Zone 10 within the SEZ have been proposed as the locations for the establishment of the marine servitudes. The study site is considered to be sensitive; the following features have been identified:

- Areas below the coastal management line and/or within 100 m of the high water mark of the sea.
- Mobile dune process areas and/or areas sensitive to coastal erosion.
- CBAs identified in Coega OSMP.
- Damara tern habitat (dunefield areas and duneslacks).
- Areas within the 1:100-year floodline of the Coega River or 100 m of the Coega River/Estuary (whichever is greater) and 50 m of wetlands.
- Identified archaeological and paleontological.
- Areas that would conflict with existing facilities or infrastructure and/or rights and planned expansions/infrastructure reflected on approved development plans.
- The alignment and positioning of required land-based infrastructure has been identified, firstly to align with the positioning of the marine based servitudes and secondly, to avoid open space areas.
- Addo Elephant National Park Marine Protected Area

IMPACTS IDENTIFIED

The following impacts have been identified as a result of the proposed project:

ISSUE	PREFERRED ALTERNATIVE		NO-GO ALTERNATIVE
	IMPACT	AVAILABLE MITIGATION MEASURES	
Impacts on topography and bathymetry (design, construction and decommissioning phase)	**MODERATE (-)**	√	**MODERATE (-)**
Impacts on land use (construction, operational and decommissioning phase)	**HIGH (+)**	NONE REQUIRED	**HIGH (+)**
Soil Contamination and Erosion (design, construction, operation and decommissioning phase)	**LOW (-)**	√	**LOW (-)**
Impacts on Surface and Groundwater Resources (design, construction, operational and decommissioning phase)	**MODERATE (-)**	√	**MODERATE (-)**
Impact on Seawater Quality (construction, operational and decommissioning phase)	**HIGH (-)**	√	**HIGH (-)**

ISSUE	PREFERRED ALTERNATIVE		NO-GO ALTERNATIVE
	IMPACT	AVAILABLE MITIGATION MEASURES	
Change in Marine Sediment Dynamics and Wave Action (design, construction, operational and decommissioning phase)	**MODERATE (-)**	√	**MODERATE (-)**
Disturbance of the Coastal Zone and Loss of Coastal Public Property (design, construction, operational and decommissioning phase)	**MODERATE (-)**	√	**MODERATE (-)**
Disruption to Terrestrial Ecosystems (design, construction and decommissioning phase)	**MODERATE (-)**	√	**MODERATE (-)**
Disruption to Intertidal or Sub-Tidal Biota (design, construction, operational and decommissioning phase)	**HIGH (-)**	√	**MODERATE (-)**
Waste Management (construction, operational and decommissioning phase)	**MODERATE (-)**	√	**LOW (-)**
Health and Safety (construction, operational and decommissioning phase)	**LOW (-)**	√	**LOW (-)**
Impacts on Archaeological, Palaeontological and/or Cultural Sites (construction phase)	**LOW (-)**	√	**LOW (-)**
Social benefits from the project (construction, operational and decommissioning phase)	**LOW (+)**	√	**LOW (-)**
Provision of seawater for industrial developments (operational phase)	**HIGH (+)**	√	**HIGH (-)**
Provision of discharge infrastructure for industrial developments (operational phase)	**HIGH (+)**	√	**HIGH (-)**
Noise Impacts (construction and decommissioning phase)	**HIGH (-)**	√	**LOW (-)**
Traffic (construction and decommissioning phase)	**LOW (-)**	√	**MODERATE (-)**
Air Quality (construction and decommissioning phase)	**LOW (-)**	√	**MODERATE (-)**
Visual Impact (construction, operational and decommissioning phase)	**LOW (-)**	√	**MODERATE (-)**
Alignment with planning instruments construction, operation and decommissioning phase)	**MODERATE (+)**	√	**MODERATE (+)**
Climate change (construction, operation and decommissioning phase)	**MODERATE (-)**	√	N/A
Social benefits from project (construction, operational, and decommissioning phase)	**HIGH (+)**	√	**HIGH (-)**

ISSUE	PREFERRED ALTERNATIVE		NO-GO ALTERNATIVE
	IMPACT	AVAILABLE MITIGATION MEASURES	
Increased pressure on marine environment of Algoa Bay as a result of discharge effluent and hard structures in the dynamic coastal Zone (construction, operational and decommissioning phase)	**MODERATE (-)**	√	**MODERATE (+)**

PUBLIC PARTICIPATION

The following has been completed as part of the PPP process:

- A site notice has been displayed on the electronic notice board at the Coega Business Centre. The e-notice will be displayed for the duration of the EIA process. This methodology and approach have been agreed to by both DEDEAT and DEFF. The e-notice replaces the site notice because the area in which the development is proposed, is remote and a site notice will not fulfil the intended purpose of the regulations.
- Landowners, occupiers, adjacent landowners and occupiers, municipal ward councillor, NMBM Municipality and Organs of State were notified of the proposed development by **phone call, sms and/or email notification.**
- A Newspaper advertisement was placed in The Herald, a locally and provincially distributed newspaper, on the 13th of November 2020 (Plate 5.2) in order to notify the general public of the submission of the application for Environmental Authorisation, as well as the availability of the Draft Scoping Report for a thirty (30) day public review period. The advertisement included a brief description of the proposed project, the main listed activities which are triggered by the proposed project, and the contact details of the EAP (phone number, e-mail address, web address and postal address). The advertisement also encouraged potential I&APs to register on the project I&AP Database and provide information on how to register as an I&AP
- Virtual Meetings were held with Key Stakeholders on request, i.e. SANParks on the 8th of November 2020.
- All comments received from I&APs to date have been incorporated into and responded to in an Issues and Response Trail.

PLAN OF STUDY FOR THE EIA

The following Specialist Studies are proposed for the EIA Phase of the assessment:

(a) Marine and Underwater Cultural and Archaeological Impact Assessment;
(b) Environmental Economic Impact Assessment;
(c) Review of existing Baseline Marine Ecology Report;
(d) Geotechnical Assessment
(e) Ecological Impact Assessment;
(f) Marine Dispersion Modelling;
(g) Aquatic Impact Assessment – Existing study findings to be incorporated into the EIA; and
(h) Heritage Impact Assessment – Existing study findings to be incorporated into the EIA and EMPr's.

WAY FORWARD

The following way forward is proposed:

- CES will submit this Final Scoping Report to DEFF on the 15th of January 2021

- CES will complete all specialist assessments.
- CES will notify all registered I&APs of the submission of the Draft EIR to DEFF and public review period.
- CES will compile an Issues & Response Trail (IRT), consisting of all of the comments received during the PPP as well as responses where necessary.
- CES will compile the Final EIR (which will include the IRT) and the Final EIR will be submitted to DEFF.
- CES will notify all I&APs of the submission of the Final EIR to DEFF.
- DEFF will, either grant or reject Environmental Authorisation (EA) for the proposed project.
- CES will notify all registered I&APs of the DEA decision and the Appeals Process and Period.

1. INTRODUCTION

1.1 OVERVIEW

The Coega Special Economic Zone (SEZ) is situated on the northern side of Port Elizabeth within the Nelson Mandela Bay Metropolitan Municipality (NMBM), Eastern Cape Province (refer to Figure 1.1). Abutting the Coega SEZ on the eastern side is the Ngqura Deepwater Port, which is managed by the Transnet National Ports Authority (TNPA). The integrated SEZ and Port of Ngqura is approximately 11,500 ha in extent and comprises 14 zones designated for various light, medium and heavy industrial land uses. The purpose of the marine intake and outfall infrastructure and servitudes project is to enable the provisioning of seawater to various industries within the Coega SEZ (aquaculture, power provision and seawater desalination plant) via a number of seawater intakes and the discharge of treated effluent into the marine environment. As such, infrastructure related to this project needs to be constructed along the coast adjacent to the Coega SEZ. The Port of Ngqura and Zone 10 within the SEZ have been proposed as the locations for the establishment of the marine servitudes.

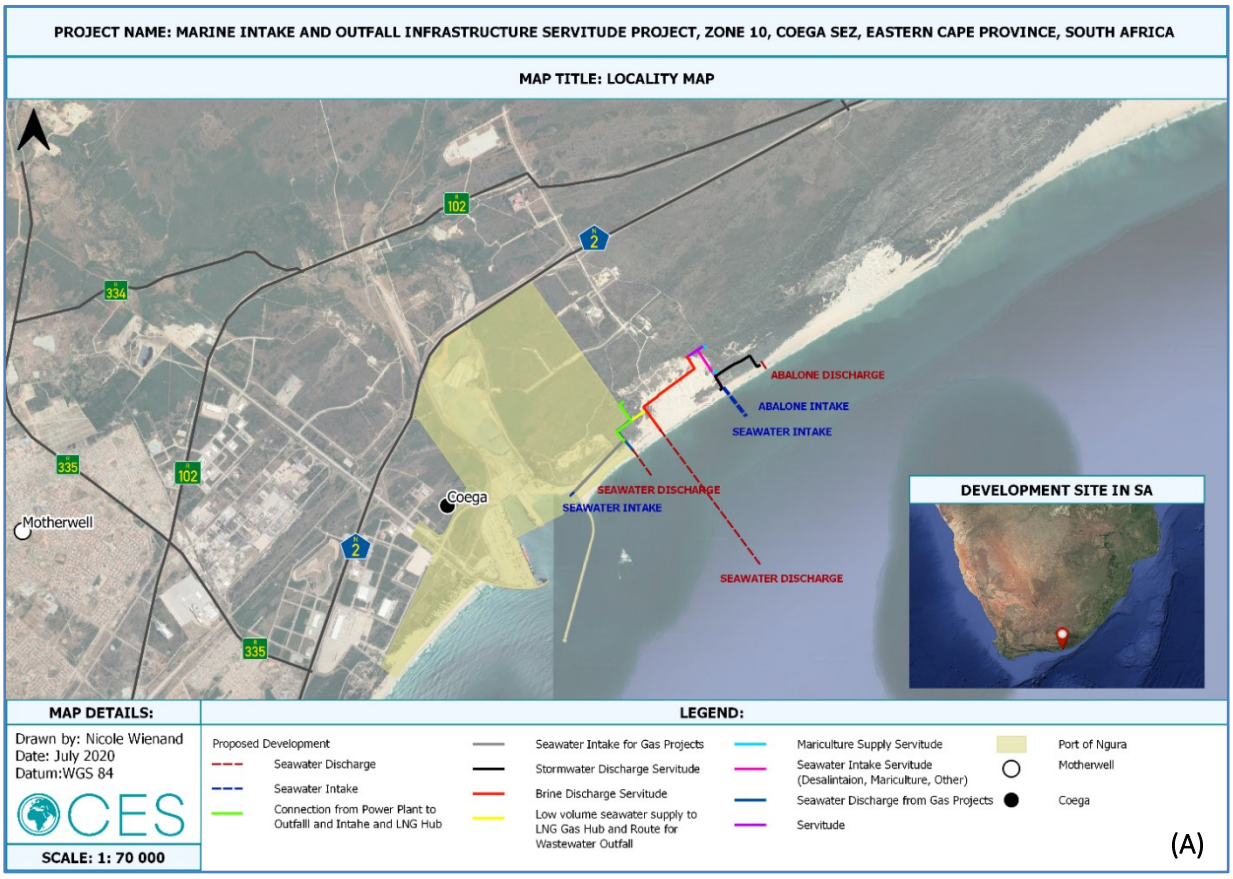


Figure 1.1: Locality map for the proposed project showing farm portions.

1.2 INTAKE INFRASTRUCTURE

The need for the marine seawater abstraction servitudes is driven by the water requirements for the following proposed Coega SEZ industries:

- Cooling water for two 1000 MW Liquefied Natural Gas (LNG) power stations for which the Environment Impact Assessment (EIA) is currently in progress.
- Land-based aquaculture (including 42,370 tonnes / year of abalone and finfish). Environmental Authorisation was received on 07 February 2018.
- The Coega Aquaculture Development Zone (ADZ) includes the development of a Seawater Desalination Plant with a maximum capacity of 60 megalitres (Mℓ)/ day. Environmental Authorisation was received as part of the authorisation for the ADZ on 07 February 2018.

The following maximum seawater intake requirements are projected:

Purpose	Worse case intake flow rates
Cooling Water: Once-Through Cooling	14.70 m^3/sec
Cooling Water: Wet Mechanical Draft Cooling	0.42 m^3/sec
Aquaculture flow through system for abalone	5.00 m^3/sec
Aquaculture recirculation system for finfish	0.94 m^3/sec
Seawater Desalination Plant	2.03 m^3/sec
Total	**23.09 m^3/sec**

There will be two seawater abstraction servitudes with associated infrastructure:
1. Inside the Port of Ngqura for a Once-Through and Wet Mechanical power station cooling water requirements; and
2. East of the Port of Ngqura to meet the more specific water quality requirements of the aquaculture industries, and for desalination.

Within each servitude, a number of different seawater abstraction technologies will be utilised, depending on industry requirements. Therefore, ALL the following types of abstraction technologies will be implemented and assessed in the EIA:

- Abstraction basin with concrete intake channels (within the Port);
- Abstraction pipeline and jetty (within the Port);
- Seawater abstraction pipelines;
- Vertical beach wells;
- Onshore pump stations and screening facilities; and
- WEROP wave pumps.

Detailed descriptions of these technologies are provided in Chapter 2 of this report.

1.3 OUTFALL INFRASTRUCTURE

The need for the marine effluent discharge servitudes is mostly driven by a corresponding need by the respective Coega SEZ industries to return effluent seawater back into the offshore marine environment. Other discharges will include wastewater treatment effluent and stormwater.

The following maximum effluent discharge requirements are projected:

Purpose	Type of effluent	Worse case discharge flow rates
Cooling water: once-through cooling	Seawater at 28°C and salinity of 35 ppt	14.70 m^3/sec
Cooling water: wet mechanical draft cooling	Seawater at 23°C and salinity of 53 ppt	0.30 m^3/sec
Aquaculture flow through system for abalone	Seawater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD.	5.00 m^3/sec
Aquaculture recirculation system for finfish	Seawater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD.	0.94 m^3/sec
Desalination brine	Brine at 60 ppt	1.22 m^3/sec
Wastewater	Treated domestic and industrial wastewater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD, salinity heavy metals and E.coli	0.93 + 0.46 m^3/sec
Stormwater	Rainwater	Uncertain
TOTAL		**23.55 m^3/sec**

ALL the following technologies will be implemented to discharge the various effluent streams from the various proposed land-based uses into the sea.

- Tunnel discharge;
- Pipeline discharge;
- Surf zone discharge; and
- Beach discharge (for stormwater).

Detailed descriptions of these technologies are provided in Chapter 2 of this report.

The time of construction of the various intake and discharge structures within the servitudes will be dictated by the demand and timing of the implementation of the various industries.

1.4 PURPOSE OF THIS REPORT

The Coega Development Corporation (CDC) appointed Coastal and Environmental Services (CES) as the independent Environmental Assessment Practitioner (EAP) to conduct the EIA process for the proposed marine intake and outfall infrastructure and servitudes project in terms of the EIA Regulations (2014 and subsequent 2017 amendments).

In addition, a Draft Coastal Waters Discharge Permit (CWDP) application (as required by Section 69 of the NEM: Integrated Coastal Management Act (Act No. 24 of 2008) for discharge of effluent into the marine environment) will be submitted to the Department of Environment, Forestry and Fisheries (DEFF): Oceans and Coasts.

The Scoping Report is the first of a number of reports produced in the EIA process. This Scoping Report was compiled in accordance with the requirements as stipulated in Section 21 and Appendix 2 of the EIA Regulations (GN R.982) (2014 and subsequent 2017 amendments), which clearly outlines the content of a Scoping Report.

The objective of the scoping process, as set out by the EIA Regulations (2014 and subsequent 2017 amendments), is to, "*through a consultative process-*

(a) Identify the relevant policies and legislation relevant to the activity;
(b) Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
(c) Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
(d) 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;
(e) Identify the key issues to be addressed in the assessment phase;
(f) 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
(g) 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."

1.5 PROJECT MOTIVATION

1.5.1 Need and Desirability

The following provides the motivation for the establishment of the marine seawater intake and effluent discharge servitudes within and adjacent to the Coega SEZ.

1.5.1.1 Further investment into the Coega SEZ

The primary need for the abstraction of seawater is to facilitate the co-ordinated development of infrastructure for a number of possible investors in the Coega SEZ that would require seawater in their processes. The Coega SEZ is currently the largest SEZ in the Southern Hemisphere and is adjoined by a deepwater harbour (Port of Ngqura). According to the Nelson Mandela Bay Municipality (NMBM) Spatial Development Framework (SDF, 2015) the Coega SEZ, under the stewardship of the CDC, has managed to attract billions of Rands of investments into the economy of the Eastern Cape and thus enabling thousands of jobs to be created. In addition, a number of large projects valued at over R75 billion, are currently being considered.

According to the Eastern Cape Provincial Spatial Development Plan (2017 Final Draft), the Coega SEZ is one of the two SEZs in the Province and as such is seen as having significant economic growth potential for the Eastern Cape Province. Having the appropriate infrastructure available to investors will enhance the attractiveness of the Coega SEZ as an investment destination and, therefore, improve investment attractiveness. This will result in improved revenue generation, foreign exchange, realisation of taxes and royalties. An increase in investment into the area will also result in increased employment, further local economic development, skills development and local procurement.

The EA for the aquaculture zone was approved in February 2018. However, if the SEZ is not able to meet the water requirements for this industry, no further development of this zone would be possible.

1.5.1.2 Lower Environmental Impact

Relevant Government Departments involved in water resource and coastal management (e.g. DWS and DEA: Oceans and Coasts), have advised the CDC that it would be beneficial for the SEZ to have dedicated servitudes for the placement of infrastructure needed for the abstraction of seawater and discharge of treated effluent to the marine environment rather than each industry

establishing its own set of infrastructure. This would improve effectiveness and efficiency in the management of the volumes and quality of effluent, would streamline the maintenance of infrastructure, and would also result in less physical impacts to the coastal environment by reducing the number of points where hard structures are placed in the dynamic coastal zone. In addition, depending on the receiving environment and the position and depth of discharge, the release of effluent into the marine environment rather than rivers or estuaries has potentially less environmental impact because of increased assimilative and dispersive capacity.

1.5.1.3 *Reduced Costs*

The development of integrated servitudes would have economic benefits by confining the placement of infrastructure to a dedicated area with the potential for shared infrastructure, thereby reducing costs associated with a network of pipes and pump stations. Similarly, planning requirements would be reduced.

1.5.1.4 Cooling water

The largest volumes of seawater are required for the cooling of two proposed 1,000 MW water-cooled power plants in Zone 10 of the SEZ, which will enable the CDC to provide tenants with a secure access to energy and contributes to the overall energy security of South Africa.

The NMBM (through Eskom) supplies electricity to over 297 000 customers in the NMBM area, and has an annual turnover of approximately R1.8 billion. Eskom supplies an incoming voltage of 132 kV which is then distributed to industrial, commercial and residential consumers. Due to the growing population the need for basic services such as electricity continues to increase, and thus the backlog is also increasing. As such there is a need to improve, upgrade and provide additional electricity to the region. In order to achieve universal access to electricity, grid and non-grid technologies have to be implemented in line with the National Energy vision that “more than 90 percent of the population should enjoy access to grid-connected or off-grid electricity within 20 years”, as well as to implement any other possible technologies based on cost-effective options in order to address current and future backlogs.

1.5.1.5 Seawater Desalination

The NMBM is considered to be a water-stressed area. In September 2020, the NMBM declared Day Zero and a number of areas within the NMBM were left without water and needed to be provided with this basic service via a number of water tankers. This situation is exacerbated by poor maintenance of water infrastructure within the NMBM. Based on this, alternative means of providing water, such as the desalination of seawater, have been considered, especially amidst the crisis brought about by the COVID-19 Pandemic that the Country is facing currently, with proper sanitation and hygienic practices being paramount at preventing the spread of this pandemic. It is important to note that no investments could be attracted into any location that has a shortage of water and/or electricity. The Desalination will assist the CDC in providing tenants with a secure access to fresh water thereby improving its value proposition as a world-class investment location. The utilisation of desalinated water within the SEZ would relieve some of the stress on the NMBM to provide the required amount of fresh water for CDC tenants and industry within the SEZ.

1.5.1.6 Land-based marine aquaculture

The establishment of an Aquaculture Development Zone (ADZ) within Zone 10 of the Coega SEZ has been in planning for a number of years. The economic motivation for the establishment of 440 Ha and long-term production target of over 40,000 tons of production per annum (finfish, abalone and shellfish) in the ADZ is provided in the CES feasibility study conducted in 2015. The ADZ will provide significant employment opportunities estimated at over 5000 people in the long-term. Consequently, the CDC progressed the ADZ concept and obtained environmental authorization for the development of the ADZ in 2018. Accessing seawater for land-based marine aquaculture will contribute to the promotion of local food security and export products.

1.5.1.7 Wastewater Treatment Works (WWTW)

The NMBM has the highest percentage of households with access to flush/chemical toilets compared to other district municipalities in the Eastern Cape. Over 90% of households have access to proper sanitation services. However, the NMBM does not have the capacity to provide these sanitation services to its residents, which is evident by the need of the recent upgrade of the Fishwater Flats WWTW as well as the additional capacity and infrastructure currently being constructed at the Driftsands WWTW. This situation is exacerbated by poor maintenance of infrastructure within the NMBM. This was evident in September 2020, when a blocked drain resulted in sewage spills encompassing 10 houses in Booysens Park, Port Elizabeth. Consequently, additional sewage capacity is required within the NMBM and this will require the discharge infrastructure for treated effluent.

1.5.1.8 Stormwater

The CDC has developed a stormwater master plan for Zone 10 where the stormwater will discharge to three locations on the shoreline.

1.6 THE PROPONENT

CES has been appointed by the CDC as the independent Environmental Assessment Practitioner to undertake the EIA for the proposed marine servitude project.

Coega Development Corporation

Physical Address: Coega Development Corporation, Coega SEZ Business Centre, Corner Alcyon Road and Zibuko Street, Zone 1, Coega SEZ, Port Elizabeth
Postal Address: Coega Development Corporation, P.O. Box 6009, Port Elizabeth
Telephone: 041 403 0400
Website: www.coega.co.za
Email: sadick.davids@coega.co.za

1.7 THE EIA TEAM

Coastal and Environmental Services (CES), trading as CES Environmental and Social Advisory Services

Physical Address: 36 Pickering Street, Newton Park, Port Elizabeth
Postal Address: 36 Pickering Street, Newton Park, Port Elizabeth
Telephone: +27 41 393 0700
Website: www.cesnet.co.za
Email: info@cesnet.co.za

Project team:

EAP, Team Leader and Internal review: Dr Alan Carter	Dr Alan Carter is an Executive **at CES** and the CES East London Branch Manager. He has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the United States of America (USA). He is a member of the American Institute of Certified Public Accountants (licensed in Texas) and holds a PhD in Plant Sciences. He is also certified ISO14001 EMS Auditor with the American National Standards Institute. Dr Carter has been responsible for leading and managing numerous and varied consulting projects over the past 25 years. He is a registered professional with the South African Council for Natural Scientific Professionals (SACNASP) and through Environmental Assessment Practitioners Association of South Africa (EAPASA).

Project Manager & Report Production: Dr Chantel Bezuidenhout	Dr Chantel Bezuidenhout holds MSc and PhD degrees in Botany (estuarine ecology) and a BSc degree in Botany and Geography from Nelson Mandela Metropolitan University (South Africa). Dr Bezuidenhout has been an Environmental Consultant for approximately 10 years and as such has been focusing on environmental management and impact assessment. She is well versed in environmental legislation and has managed a number of environmental, social and health impact assessments and management plans for heavy mineral mining in South Africa and Madagascar. These projects have been completed to international standards (IFC and World Bank). In addition, Dr Bezuidenhout has also completed ESHIA's for a number of open cast mines in Zambia and Mozambique. These projects were also completed to IFC Standards and have been granted environmental authorizations from their host countries. All the ESIAs that have been managed by Dr Bezuidenhout included community consultations and as such she has been involved in various forms of community engagements in the rural African settings. Dr Bezuidenhout has also been extensively involved in the data collection and report wring for land and natural resource use assessments in both Madagascar and Mozambique. The data gathering component involves extensive community meetings as well as focus group meetings to establish land use (including agriculture) and natural resources use within the communities and wider regions. Dr Bezuidenhout has recently completed an extensive land survey as part of a RAP process for a heavy minerals mine in Mozambique and an in-kind land survey for a large infrastructure project in Tanzania, and as such is well-versed with the relevant process. She is a Principal Consultant and Branch Manager of the CES Port Elizabeth Office.
Public Participation and GIS Mapping: Ms Nicole Wienand	Ms Nicole Wienand is CES's Environmental Consultant who is based in the Port Elizabeth branch. Ms Wienand obtained her BSc Honours in Botany (Environmental Management) from the Nelson Mandela Metropolitan University (NMMU) in December 2018. She also holds a BSc Degree in Environmental Management from NMMU. Ms Wienand's Honours project focused on the composition of subtidal marine benthic communities on warm temperate reefs off the coast of Port Elizabeth (a baseline survey) and for her undergraduate project she investigated dune movement in Sardinia Bay. Her key interests include the GIS Mapping, the general EIA process, Public Participation Process (PPP) and Ecological Impact Assessments.

CES Specialist Team:

Ecological Specialist: Dr Greer Hawley	Dr Greer Hawley-McMaster has a BSc degree in Botany and Zoology, a BSc (Honours) in Botany from the University of Cape Town and a PhD (Microbiology) from Rhodes University. Dr Hawley-McMaster has a diverse skill set including biodiversity surveys and assessments (plants, fungi and terrestrial ecosystems), developing environmental management policy (EMP's and EMF's), analysis and interpretation of environmental and biodiversity spatial datasets, training, feasibility assessments, environmental impact assessments for a wide range of land use activity proposals, aquaculture feasibility assessments, alien invasive management planning and conservation management planning. Dr Hawley-McMaster has undertaken work in a number of African countries and has specifically surveyed many parts of the Eastern Cape. As a Principal Consultant, Dr Hawley-McMaster manages large projects and has experience with co-ordinating big specialist teams. Dr Hawley-McMaster has recently completed the review of the Eastern Cape Biodiversity Conservation Plan (2019) and continues to develop the Eastern Cape Biodiversity strategy and Action Plan.
Economic Specialist: Dr Alan Carter	Dr Alan Carter is an Executive at CES and the CES East London Branch Manager. He has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants (licensed in Texas) and holds a PhD in Plant Sciences. He is also

	certified ISO14001 EMS Auditor with the American National Standards Institute. Dr Carter has been responsible for leading and managing numerous and varied consulting projects over the past 25 years. He is a registered professional with the South African Council for Natural Scientific Professionals (SACNASP) and through Environmental Assessment Practitioners Association of South Africa (EAPASA).

External Specialist Team:

Marine Archaeology Specialist: Ms Vanessa Maitland	Ms Vanessa Maitland received her BA majoring in Archaeology and her Honours degree in Archaeology from the University of the Witwatersrand in 1994 and 1997. She has worked on numerous sites covering all aspects of South African Archaeology. Since 2000, Ms Maitland has specialised in Maritime Archaeology, working on a number of wreck removals and Underwater Heritage Impact Assessments. She has many years of experience in magnetometer surveys and diver searches. Ms Maitland is currently completing her Master's Degree in Maritime Archaeology through UNISA. She is registered as a CRM practitioner with ASAPA.
Geotechnical Assessment: Mr Brent Cock	Mr Brent Cock has been involved in the field of Exploration Geology and Engineering Geology for the past 15 years. His expertise includes Lithostructural Mapping; Geological, Geotechnical core and rock chips logging and sampling including supervision; Geochemical and stream sediment sampling; ground investigations for subsidy housing (in accordance with NHBRC guidelines), road upgrades, pipelines, earth dams, warehouses, buildings of masonry construction, cemeteries, waste water treatment works, renewable energy projects (solar and windfarms) and nuclear sites.
Marine Ecological Assessment: Mr Barry Clark	Dr Barry Clark has twenty-eight (28) years' experience in Marine Biological research and consulting on coastal zone and marine issues. He has worked as a scientific researcher, lecturer and consultant and has experience in tropical, subtropical and temperate ecosystems. He is presently Director of an Environmental Consultancy firm (Anchor Environmental Consultants) and Research Associate at the University of Cape Town. As a consultant, he has been concerned primarily with conservation planning, monitoring and assessment of human impacts on estuarine, rocky shore, sandy beach, mangrove, and coral reef ecosystems as well as coastal and littoral zone processes, aquaculture and fisheries. Dr Clark is the author of 27 scientific publications in Class A Scientific Journals as well as numerous scientific reports and popular articles in the free press. Geographically, his main area of expertise is Southern Africa (South Africa, Lesotho, Namibia, Mozambique, Tanzania, Seychelles, Mauritius and Angola), but he also has working experience from elsewhere in Africa (Republic of Congo, Sierra Leone, Liberia, Cote d'Ivoire, Ghana, Nigeria), the Middle East (UAE) and Europe (Azerbaijan).
Marine Dispersion Modelling Mr Stephen Luger	Mr Stephen Luger received an MSc in Civil Engineering from the University of Cape Town in 1991. He was then employed by the Council for Scientific and Industrial Research (CSIR) for sixteen (16) years as a coastal modelling specialist. For the past nine years he has been employed by Prestedge Retief Dresner Wijnberg (PRDW) Consulting Engineers as a coastal modelling specialist and currently holds the post of Technical Director. He has twenty-four years of experience in the application of numerical models in the fields of coastal hydrodynamics, waves, tsunamis, sediment transport, outfalls, water quality, dredging, oil spills and flooding. These modelling studies have been conducted for feasibility studies, environmental impacts studies, nuclear safety studies and detailed engineering design. The countries where the studies have been conducted include South Africa, Namibia, Gabon, Nigeria, Kenya, Mauritius, Seychelles, Guinea, Mozambique, Madagascar, Cameroon, Angola, Egypt, Bahrain, Qatar, United Arab Emirates, Jordan, Israel, Ireland, Chile, Peru, Brazil and Australia. He is the author or co-author of over 20 articles in scientific journals,

	chapters in books and conference proceedings, over 100 technical reports for external contract clients, and has presented over 20 papers at local and international conferences.
Marine Ecologist responsible for the interpretation of the Marine Dispersion Modelling Mr Robin Carter	Mr Robin Carter carried out post-graduate studies in Marine Science at the University of Natal (Durban) (MSc) and University of Cape Town (PhD). Subsequently, he was employed by CSIR, in Stellenbosch, leading the Marine Biology Division and Marine Biotechnology Programme as well as coordinating their overall Marine Science Research Programme. During this period (1983 – 1997) he led and participated in contract work on oil and gas developments on continental shelves, harbour development studies, primarily in Saldanha Bay and mariculture development focussing on abalone. After leaving CSIR in 1997 he practiced as an Independent Specialist Consultant in Applied Marine Science. His main areas of work were in harbour development (Saldanha, Cape Town and Ngqura), specialist studies within marine oil and gas development EIAs, and investigations on marine discharges and technical reviews of marine monitoring practice and applications. In 2005 he joined Lwandle Technologies (Pty) Ltd, a Level 2 BEE company focused on providing specialist scientific advice and measurement capabilities to commercial and state entities involved in marine and coastal development and enterprises. Their clients include oil and gas companies, Maersk Oil, Sonangol, Petrobras, ENI, PetroSA, Anadarko, Forest Oil and BP, with Shell and Sasol being indirectly served through other consulting groups. A significant component of their business is assessing and measuring the environmental effects of harbour development and expansions of services. Recent contract work covers studies for Transnet in the Ports of Cape Town and Durban, Namibian Marine Phosphates in Walvis Bay, Riversdale Mining Mozambique on coal export though the Zambezi River mouth, Vale (Brazil) on the development of coal export facilities in Nacala, Mozambique and for Anadarko Petroleum Corporation on the establishment of an LNG plant in Mozambique. Marine discharges form another important element of Lwandle's business portfolio with their work ranging from effluent tracking through site specific evaluations to participating in provincial and national policy development.

1.8 SCOPING REQUIREMENTS AS PER EIA REGULATIONS (2014 AND SUBSEQUENT 2017 AMENDMENTS)

This report is the first of a number of reports that will be produced during the EIA process. **Table 1.2** outlines the requirements of the Scoping Report as set out in the NEMA EIA Regulations (2014 and subsequent 2017 amendments). According to Appendix 2 (1) of the Regulations "*A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include…"* the information outlined in Table 1.2 below. In addition, a Public Participation Process (PPP) will be undertaken in accordance with Sections 39-44 of the Regulations, which outline the requirements for a successful PPP.

Table 1.2: Requirements for the Scoping Report and content (in accordance with Appendix 2 of the EIA Regulations).

Relevant section in GNR. 982	Requirement description	Relevant section in this report
(a) Details of-	(i) The EAP who prepared the report; and	Section 1.7 and Appendix 2.
	(ii) The expertise of the EAP, including a curriculum vitae;	
(b) The location of the activity, including-	(i) The 21 digit Surveyor General code of each cadastral land parcel;	Section 2.2 (Table 2.1).
	(ii) Where available, the physical address and farm name;	
	(iii) Where the required information in items (i) and (ii) is not	

Relevant section in GNR. 982	Requirement description	Relevant section in this report
	available, the coordinates of the boundary of the property or properties;	
(c) A plan which locates the proposed activity or activities applied for at an appropriate scale	(i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	Section 2.2 (Figure 2.1) and Section 1.1 (Figure 1.1).
	(ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 2.1 (Table 2.1).
(d) A description of the scope of the proposed activity, including	(i) All listed and specified activities triggered;	Section 3.2.1 (Table 3.2).
	(ii) A description of the activities to be undertaken, including associated structures and infrastructure;	Chapter 2
(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	Chapter 3.
(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 1.5.1.
(g) A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including -	(i) Details of all the alternatives considered;	Section 2.6.
	(ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 5.6 and Appendix 1.
	(iii) 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 5.6.4.
	(iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 4.
	(v) The impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified 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 6.3.
	(vi) The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 6.2.
	(vii) 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 6.3.
	(viii) The possible mitigation measures that could be applied and level of residual risk;	Section 6.3.
	(ix) The outcome of the site selection matrix;	Section 2.6
	(x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	Section 2.6
	(xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 2.6

Relevant section in GNR. 982	Requirement description	Relevant section in this report
(h) A plan of study for undertaking the environmental impact assessment process to be undertaken, including	(i) A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Section 7.1.
	(ii) A description of the aspects to be assessed as part of the environmental impact assessment process;	Section 7.2 (Table 7.1).
	(iii) Aspects to be assessed by specialists;	Section 7.3.
	(iv) A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;	Section 7.4.
	(v) A description of the proposed method of assessing duration and significance;	
	(vi) An indication of the stages at which the competent authority will be consulted;	Section 7.5.1.
	(vii) Particulars of the public participation process that will be conducted during the environmental impact assessment process; and	Section 7.5.
	(viii) A description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 7.6.
	(ix) Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Section 6.3 and Section 7.2.
(i) An undertaking under oath or affirmation by the EAP in relation to -	(i) The correctness of the information provided in the report;	Appendix 3.
	(ii) The inclusion of comments and inputs from stakeholders and interested and affected parties; and	
	(iii) 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;	
(j)	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;	
(k)	Where applicable, any specific information required by the competent authority; and	Appendix 4
(l)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	The requirements of Section 24(a) and (b) will be met in the EIA Phase.
(2)	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a Scoping Report, the requirements as indicated in such notice will apply.	Appendix 4

1.9 REPORT STRUCTURE

The structure of the report is as follows –

Chapter 1 – Introduction:

Chapter 2 – Project Description: Provides a description of the proposed development, the properties on which the development is to be undertaken and the location of the development on the property. The technical details of the project are also provided in this Chapter.

Chapter 3 – Legal and Policy Framework: Identifies all the legislation and guidelines that have

been considered in the preparation of this Scoping Report.

Chapter 4 – Environmental and Social Baseline: Provides a brief overview of the bio-physical and socio-economic characteristics of the site and its environs that may be affected by the proposed development, compiled largely from published information, but supplemented by information from site visits.

Chapter 5 – The EIA Process: Provides details of the process that will be followed when conducting the EIA as per Regulation 23, including the Public Participation Process conducted in terms of Regulation 41. This chapter includes the objectives of the EIA process as outlined in Appendix 3 of the EIA Regulations.

Chapter 6 – Impacts and Risks identified during Scoping: Provides a description of the key issues that have been identified by the project team and through discussions with Interested and Affected Parties (I&APs) thus far in the Scoping Phase, and that will be assessed in the EIA phase.

Chapter 7 – Plan of Study: Sets out the proposed approach to the EIA including:

- A description of the scope of work that will be undertaken as part of the EIA phase, including any specialist reports or specialised processes, and the manner in which the described scope of work will be undertaken;
- An indication of the stages at which the competent authority will be consulted;
- A description of the proposed methodology for assessing the environmental issues and alternatives, including the option of not proceeding with the proposed development;
- Particulars of the PPP that will be conducted during the EIA phase, and;
- Any specific information required by the authority.

References: Cites any texts referred to during preparation of this report.

Appendices: Containing all supporting information.

2. PROJECT DESCRIPTION

A detailed motivation for the need to abstract seawater for various land-based industries in the Coega SEZ has been provided in Section 1.5 of this report.

The rationale for developing integrated seawater intake and effluent discharge marine servitudes is to have a common user servitude in which a number of industries can establish infrastructure required to abstract seawater and discharge effluent into the marine environment.

This section provides a description of the technical options that will be included in the proposed seawater intake and effluent discharge marine servitudes from the Coega SEZ.

2.1 BACKGROUND TO THE DEVELOPMENT OF THE PROJECT CONCEPT

The development of the project concept has been an iterative process over a period of more than 5 years. The main informants of the design concept have included:

- CES 2015, Feasibility Study for the Development of an Aquaculture Development Zone in the Coega IDZ (Now SEZ).
- PRDW 2016, Coega Aquaculture Development Seawater Intake & Outfall Study, Concept Design Report.
- Mott McDonald 2016, Coega IDZ, Probable Power Plant Configurations.
- PRDW, 2017, Marine Pipeline Servitude for the Coega IDZ: Specialist Marine Modelling Study and Effluent Dispersion.
- Ethical Exchange 2017, Coega Land-Based Aquaculture Development Zone (ADZ) Final Environmental Impact Report.
- Carnegie Energy 2019, MEMO: Technical Inputs to Coega Gas to Power EIA Scoping Report.
- PRDW 2020, Marine Pipeline Project for the Coega SEZ, Marine Effluent Dispersion Modelling.
- Lwandle 2020, Marine Pipeline Project for the Coega SEZ, Marine Ecological Assessment.
- WSP 2020, Techno-economic Assessment: Cooling Options for the Coega SEZ Gas-to-Power Project Report.
- SRK 2020, Proposed Coega 1000 MW Gas-to-Power Plant – Zone 10 South and Zone 10 North. Draft Scoping Reports.
- Coega IDZ Stormwater Management Plan.
- Various meetings and workshops.

Details relating to these various inputs are provided where appropriate in the Project Description (Chapter 2), as well as in Chapter 3: Alternatives.

Figure 2.1 below shows the location of the proposed marine servitudes that is informed by the Marine Dispersion Modelling studies conducted by PRDW (2017 and 2020).

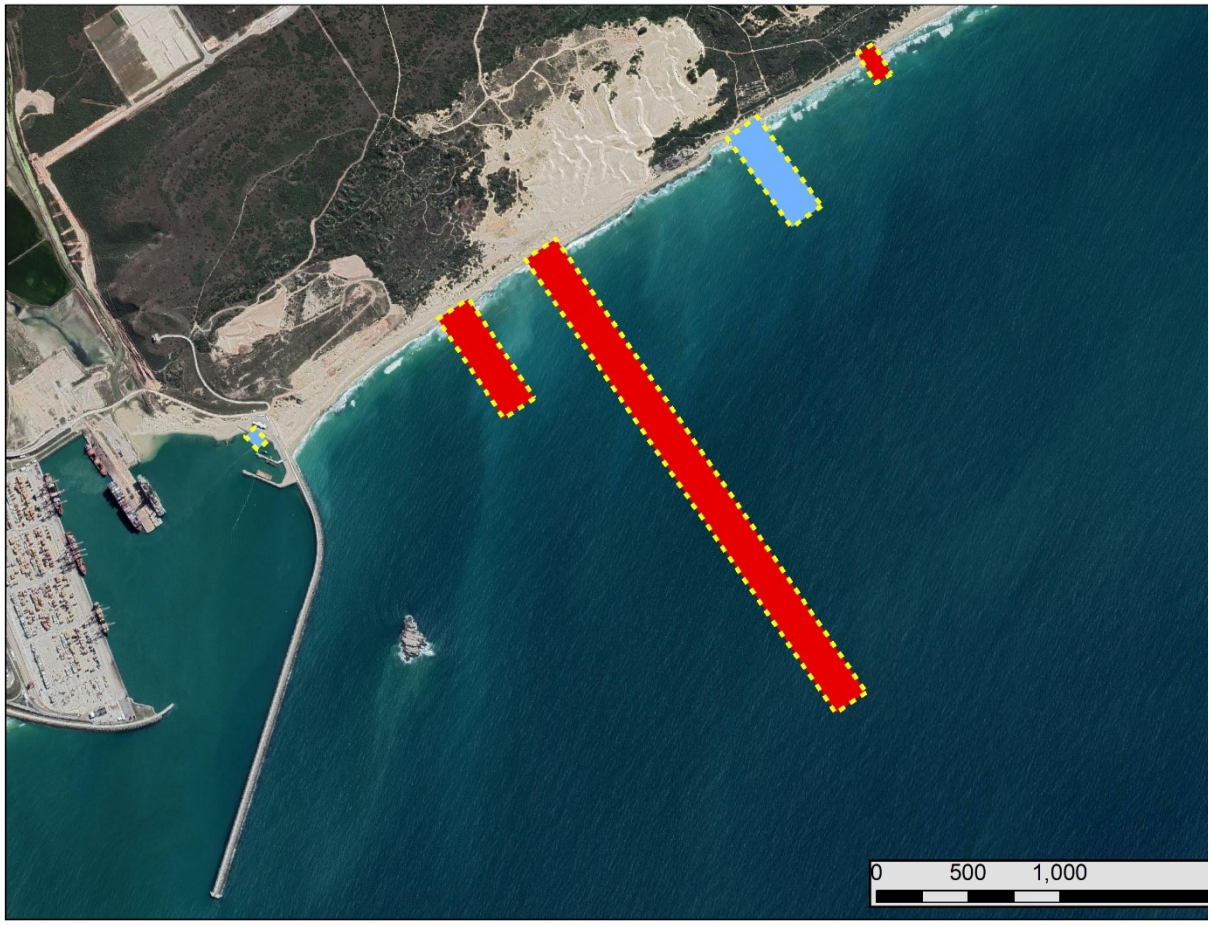


Figure 2.1: Broad locations of the proposed seawater intake (BLUE) and effluent discharge (RED) marine servitudes.

2.2 PROJECT LOCATION

The project is located in the Coega SEZ. The Coega SEZ is situated on the northern side of Port Elizabeth within the Nelson Mandela Bay Municipality (NMBM), seated in the Sarah Baartman District, Eastern Cape Province. The integrated SEZ and Port of Ngqura is approximately 11,500 ha in extent and comprises of 14 zones designated for various light, medium and heavy industrial land uses.

The Port of Ngqura and Zone 10 within the SEZ are the proposed preferred locations for the infrastructure (refer to Table 2.1 and Figure 2.2).

Table 2.1: Properties on which the proposed project is located.

PROPERTIES	21 DIGIT SG CODES	AREA (HA)	CENTRAL GPS-COORDINATE	
			Longitude	Latitude
Erf 220	C07600230000022000000	100 ha	25°42'35.11"E	33°47'1.69"S
Erf 255	C07600230000025500000	53 ha	25°41'56.87"E	33°47'31.34"S
Erf 251	C07600230000025100000	233 ha	25°40'51.84"E	33°47'13.72"S
Erf 221	C07600230000022100000	601 ha	25°43'24.09"E	33°46'7.29"S

PROPERTIES	21 DIGIT SG CODES	AREA (HA)	CENTRAL GPS-COORDINATE	
			Longitude	Latitude
Erf 302	C07600230000030200000	7.9 ha	25°43'6.79"E	33°46'51.76"S
Erf 252	C07600230000025200000	264 ha	25°42'1.61"E	33°46'21.27"S

Figure 2.3 below provides the CDC's baseline plan for the activities within Zone 10 of the Coega SEZ.

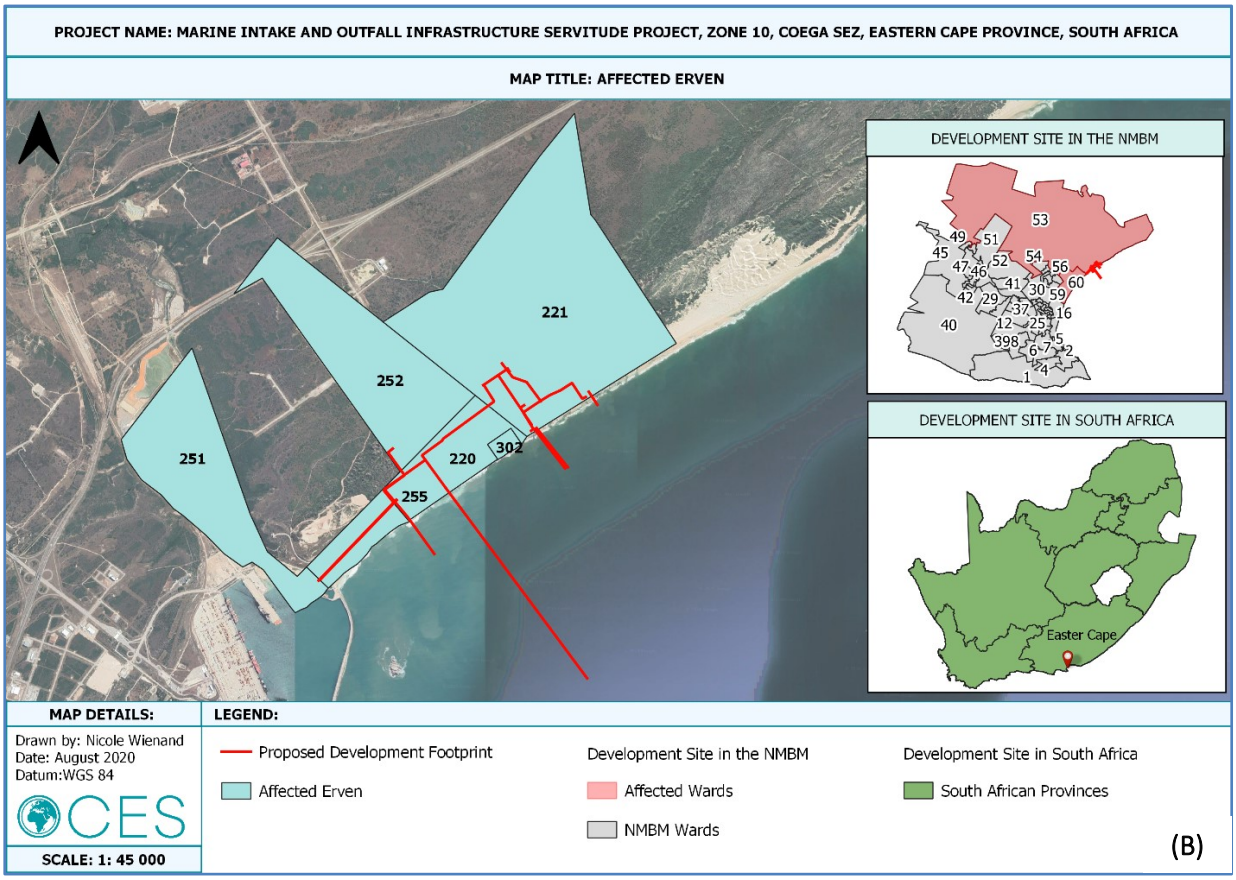


Figure 2.2: Locality map for the proposed project showing farm portions.

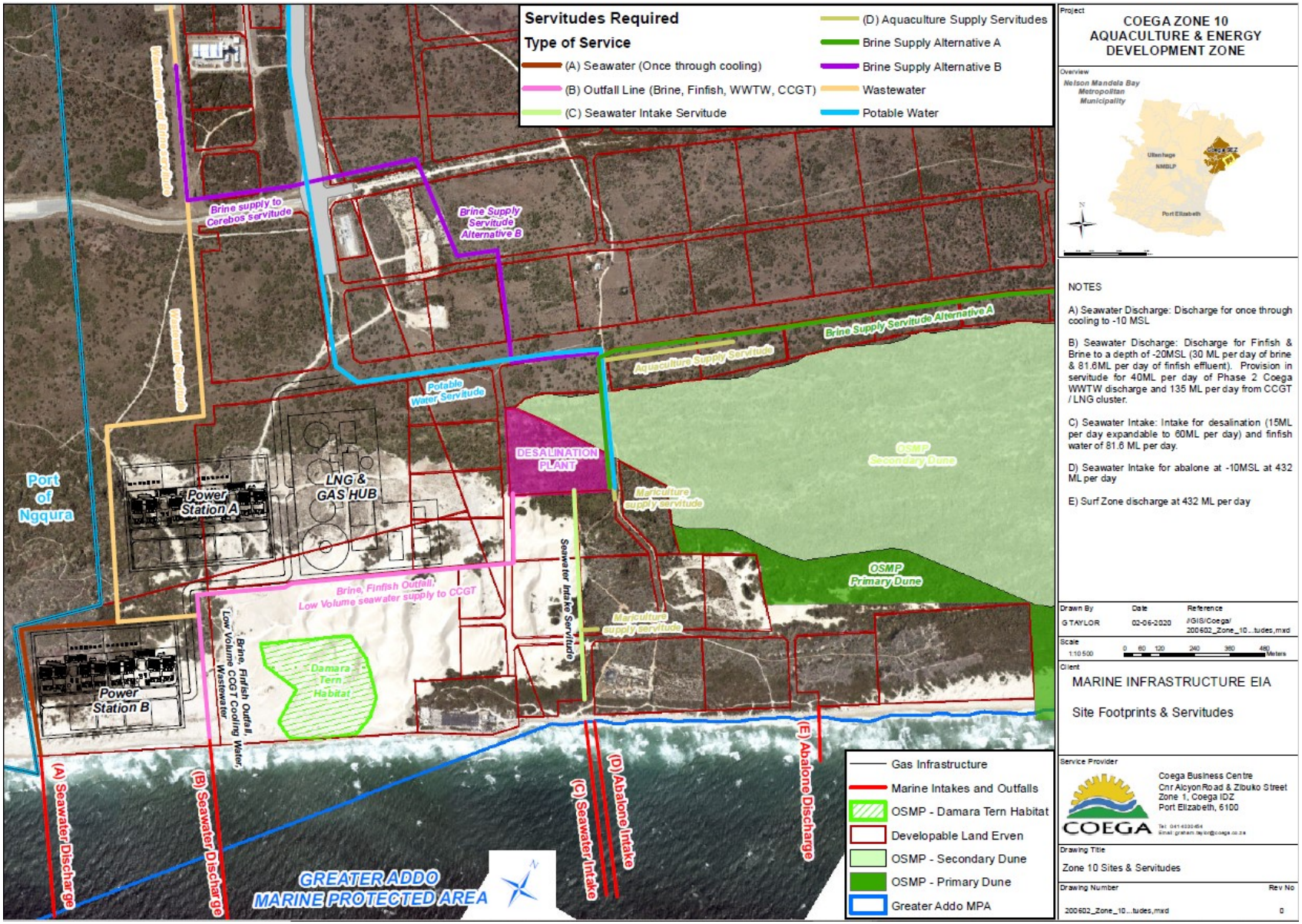


Figure 2.3: Detailed baseline plan for the Coega SEZ Zone 10 Aquaculture and Energy Development Zone.

2.3 PURPOSE OF THE PROJECT

The purpose of the marine intake servitudes is the provision of seawater for various industries (aquaculture, cooling water for power generation plants and desalination) via a number of seawater intakes of varying design to suit the end user. The marine effluent discharge servitudes will be used for the disposal of treated effluent from the aquaculture development zone, brine from the desalination plant, seawater with elevated temperatures from the power generation plants and effluent from land based waste water treatment works, into the marine environment. As such, infrastructure related to this project needs to be constructed along the coast, and hence in terms of the Integrated Coastal Management Act this infrastructure is defined as coastal dependant.

2.4 MARINE INTAKE SERVITUDES

2.4.1 Seawater intake locations and volumes

The need for the two different locations for the marine seawater intake servitudes is driven by the water requirements for the following proposed Coega SEZ industries:

1. Cooling water for two 1000 MW LNG power stations for which the EIA is currently in progress. They require large volumes of water.
2. Land-based aquaculture (including abalone, finfish and algae farming of more than 40,000 tonnes / year). Environmental Authorisation was received on 07 February 2018. Moderate volumes of good quality seawater are required.
3. The Coega ADZ includes the development of a Seawater Desalination Plant with a maximum capacity of 60 Mℓ / day. Environmental Authorisation was received as part of the authorisation for the ADZ on 07 February 2018. Moderate volumes of good quality seawater are required.

Information relating to the seawater requirements is based on input from the following sources: CES (2015), Carnegie Energy (2019), WSP (2020), Ethical Exchange (2017) and SRK (2020). There has also been *ad hoc* communication with various relevant industry specialists to confirm required seawater volume and quality requirements.

Since the water quality for the power station cooling is not critical, the required large volumes can be abstracted from inside the Port area. However, the aquaculture operations require seawater of good quality, and hence abstraction outside the Port is necessary.

The following **maximum** seawater intake volume requirements are projected:

Purpose	Worse case intake flow rates
Cooling Water: Once-Through Cooling	14.70 m^3/sec
Cooling Water: Wet Mechanical Draft Cooling	0.42 m^3/sec
Aquaculture flow through system for abalone	5.00 m^3/sec
Aquaculture recirculation system for finfish	0.94 m^3/sec
Desalination	2.03 m^3/sec
Total	**23.09 m^3/sec**

The technologies described in sections 2.4.2 to 2.4.6 of this report will be implemented to abstract seawater for the various proposed land-based industrial uses. This information is based substantially on the PRDW Concept Design Report (2016) for aquaculture, the WSP Techno-Economic Assessment Report (2020) for cooling water, and technical information provided by the CDC for other seawater requirements.

2.4.2 Marine intake technologies for Once-Through Cooling system

A Once-Through Cooling system for the proposed LNG power station requires large volumes of seawater (14.7 m^3/sec). According to the Techno-Economic Assessment Report by WSP (2020), the abstraction of the required seawater volumes can best be achieved by constructing a seawater intake basin located inside the Port of Ngqura. The intake basin would consist of four or more concrete channels and sump areas (see **Plate 2.1**), the dimensions of which would be as follows:

Dimension	Intake channels	Sump area	Unit
Length	25	4	m
Width	3.5	3.5	m
Depth	3	3	m

The intake channels would direct the seawater flow at a low velocity to three vertical turbine pumps (flowrate 4.9 m^3/s per pump). Upstream of the pumps, the channels would be fitted with screens to filter out any solids. The screens would be arranged from coarse to fine moving closer to the pumps. The channels could be isolated with a sluice gate from the stilling basin if maintenance is needed on the pumps or the incoming screens. Plates 2.1 and 2.2 below show what a cooling water intake basin could look like.

Plate 2.1: Image of cooling water intake channel configuration.

Plate 2.2: Examples of once-through cooling seawater intake infrastructure with vertical pumps on the right (Fluor, Saudi Arabia).

Three pumps would be operational at any one time, with the fourth pump acting as backup. The location of the intake is shown in Plate 2.3 below, inside the Port either within or directly adjacent to the small craft harbour.

According to the Port Masterplan, this location is the most suitable since it will not conflict with the proposed significant future extensions within the Port of Ngqura that would take place directly to the west of this location.

Plate 2.3: Intake for cooling water located within the Port of Ngqura (Source: WSP, 2020)

2.4.3 Marine intake technologies for Wet Mechanical Cooling system

According to the Techno-Economic Assessment Report by WSP (2020), since a Wet Mechanical Cooling system requires lower volumes of cooling water compared to Once-Through Cooling, an abstraction pipeline is a feasible technical solution.

This would involve the construction of an intake jetty within the Port, which would support the pipes and connect the intake chambers to the land. An intake chamber on the shoreline is required for installing a filtration system that removes larger particles from the abstraction water. However, this would be much smaller than the Once-Through Cooling intake channels.

The intake jetty will be approximately 50 m in length, and accommodate a pipe extending to a depth of about 6 m below mean sea level (MSL). It would be fitted with two vertical pumps located on the shoreline above the highwater mark (1 active and 1 on standby). An example of an intake jetty is presented in Plate 2.4 below.

A 710 mm diameter High Density Polyethylene (HDPE) pipeline would be required to deliver the required flow of 0.42 m^3/s per power plant. The HDPE is chosen because of its inherent inertness to seawater corrosion.

Plate 2.4: Example of intake jetty.

2.4.4 Marine intake technologies for aquaculture and desalination

Intake pipeline for high seawater volumes

Intake pipelines are suitable for industries that require smaller volumes of seawater than that required for the Once-Through Cooling system. Thus, intake pipelines can be used for the abalone aquaculture flow-through system (5.0 m^3/s), and seawater supply for desalination (2.0 m^3/s). However, unlike the cooling requirements for the power plants, water quality is a particularly critical issue for aquaculture operations, and hence this infrastructure cannot be located within the Port of Ngqura.

The PRDW dispersion modelling report recommends that these larger flow intake pipelines be located at 500 m offshore, to a depth of -10 Chart Datum (CD) (see Figure 2.4).

Depending on the geotechnical conditions, seawater abstraction pipelines are either anchored firmly to the seabed and shoreline, or embedded within excavated trenches. Typically, such a pipeline would be buried in trenches in the high impact beach and surf zone, and then anchored to the seabed beyond the high active surf zone. Suitable anchoring / weighting is required to ensure the pipeline is stable on the seabed during storm conditions. Further work is required to determine whether these pipelines need to be buried or anchored, and how they might be anchored to the seabed.

In the case of a buried pipeline, and depending on the results of the Geotechnical assessments, a channel will be blasted into the rocky shore from above the spring high water mark to below the spring low water mark or excavated on a sandy shoreline. After excavation, a pipe will be laid into the channel, and would then be backfilled with concrete and rock (Figure 2.4). Seawater will then flow by gravity from the sea into the sump, which is situated well below MSL (at approximately -10 CD). The depth and breadth of the sump would be dictated by the water volume requirements. Seawater flows by gravity into the beach sump, and then pumped out using submersible or land-based pumps at the intake pump station into holding tanks and distribution chambers located in the aquaculture zone (or directly to operating sites).

The intake wet well and intake pump station (Figure 2.4) are located above the spring high water mark, above expected tidal surge heights. This location will take into consideration climatic changes and the potential for sea level rise, and additional wave run-up and storm surges.

Figure 2.4 below provides a schematic layout of an embedded seawater intake pipeline and beach sump or intake wet well.

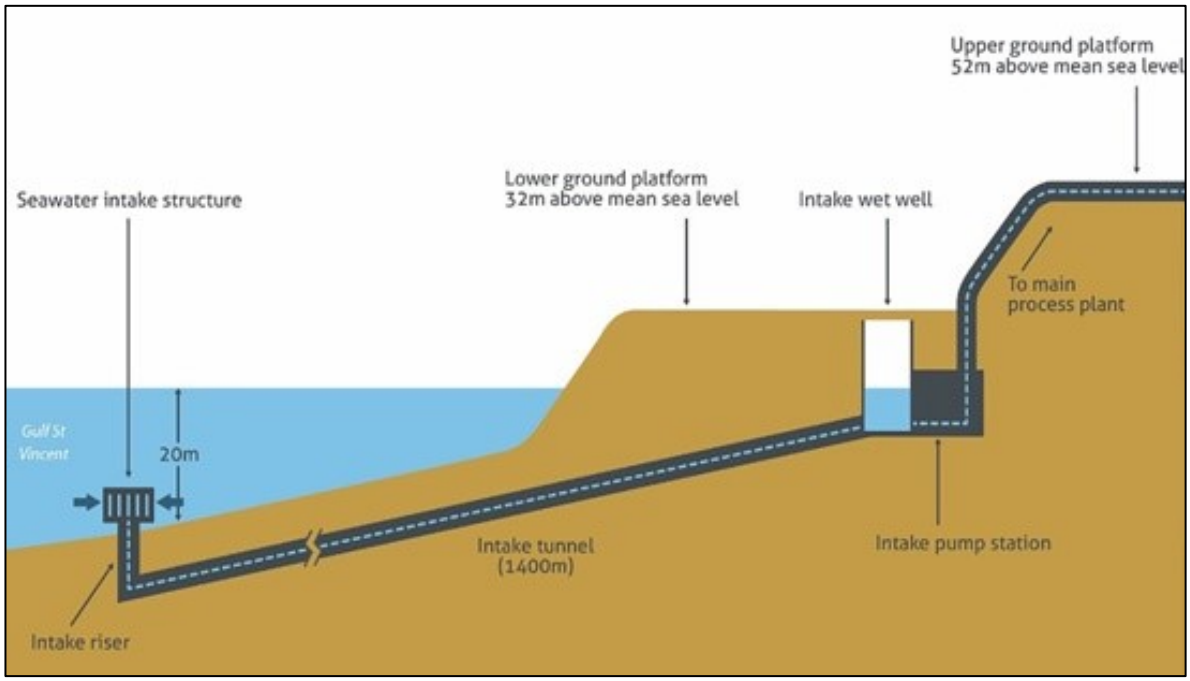


Figure 2.4: Schematic layout of an embedded seawater intake pipeline and beach sump or intake wet well.

Abalone aquaculture

The seawater intake pipeline for abalone aquaculture (5.0 m^3/s) will be made of non-corroding Glass-fibre Reinforced Plastic (GRP) or HDPE. It will be up to 2,500 mm (2.5 m) in diameter, and appropriately anchored to the seabed at an appropriate distance (500 m) and depth (-10 CD) offshore, where good quality seawater will be obtained for aquaculture purposes.

A smaller diameter dual pipeline system will be constructed to supply the 60 Ml/day desalination plant at a rate of 2.03 m^3/s. This will comprise two 1,000 mm (1.0 m) diameter HDPE pipes, laid alongside one another, and appropriately anchored to the seabed at the appropriate distance (500 m) and depth (-10 CD) offshore.

Once the pipes reach land (irrespective of whether it is a single or dual pipeline system), they will be buried in some areas and exposed in other areas, depending on the topography or ground profile along the route of the pipeline. The pipes will exit the water to a submerged pump station on land, similar to that shown in Figure 2.4.

At the offshore end of the pipeline, the intake point will need to be appropriately elevated above the seabed, and equipped with screens to reduce the intake of sediment and marine life. Intake velocities would be limited to 0.15 m/s to reduce impingement and entrainment of marine life, which is the reason for the large diameter pipes.

The intake system will include a chemical dosing component to reduce marine growth within the pipeline and intake structure, as well as pigging infrastructure for maintenance. Excavation or dredging of sand will also be required at the intake point, as well as scour protection to ensure that the structure is stable on the seabed.

Directional drilled pipeline

According to PRDW (2016) a tunnelled intake pipeline could also be constructed for aquaculture intake. It is recommended that the section of the pipeline in the surf zone is tunnelled while the remainder of the pipeline is secured to the sea bed.

To the east of the port, the beach comprises pebbles, with sand dunes behind the beach. The seabed surface is covered with a 200mm to 500mm layer of unconsolidated sediment with scattered rock outcrops. Below this layer lies an average 1.5m layer of quaternary calcarenites over a hard bedrock at a depth of -2.0m and deeper.

It is envisaged that a tunnelled pipeline will be constructed from a thrust shaft located behind the beach. The thrust shaft is then drilled out through the bedrock underneath the beach and into the sea. The vertical circular thrust shaft is approximately 10.5 m in diameter and constructed from precast concrete units which are sunk to a depth of -4 m CD. A launch seal is installed in the shaft wall and a jacking station is installed in the pit as shown in Figure 2.5 below. Up to three 1,600 mm diameter pipelines would be needed depending upon the waterflow requirements.

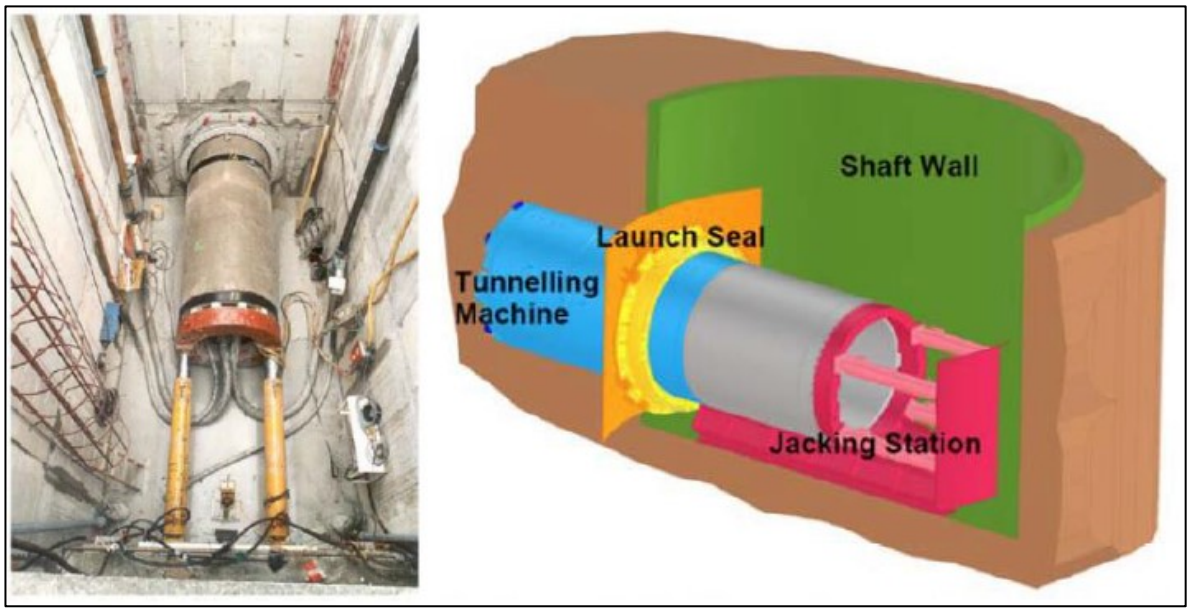


Figure 2.5: Example of thrust shaft and pipe jacking system for constructing pipeline tunnels (PRDW, 2016).

When the tunnel reaches 500 m in length, the tunnelling machine is disconnected, sealed off to prevent water ingress and placed into recovery mode. The material above the machine is then excavated or dredged such that it could be lifted onto a nearby barge. See Figure 2.6 below. The intake structure is then constructed at -10 m CD.

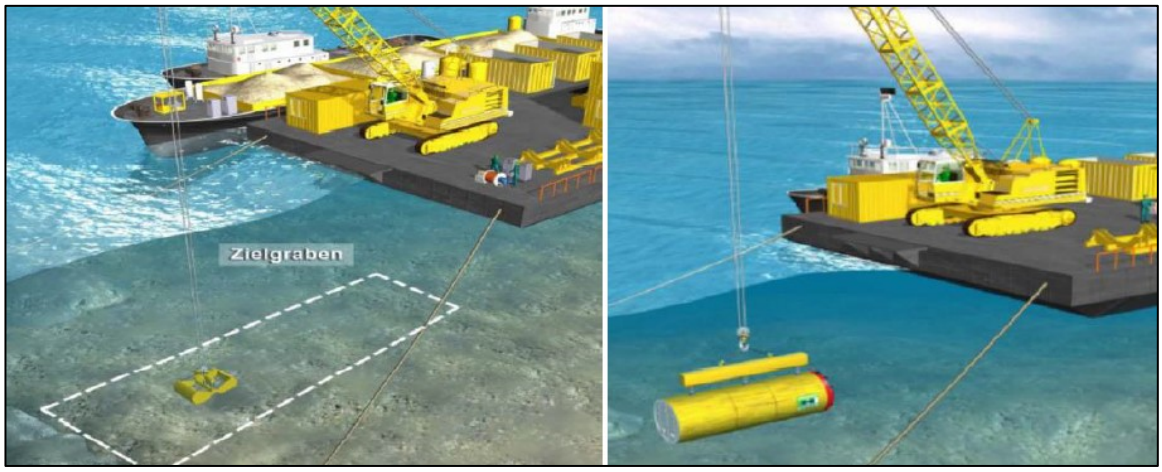


Figure 2.6: Recovery of micro-tunnelling machinery (PRDW, 2016).

Vertical beach wells for low seawater volumes

Vertical beach wells will be used to abstract the smaller volumes (< 1.0 m^3/s) of high-quality seawater required for the land-based finfish aquaculture recirculating systems. This method will require a sandy beach that is continuously connected to the sea. Perforated or slotted pipes will be placed well below chart datum in the sand medium, and these pipelines will then terminate in a sump. The seawater will flow by gravity into the sump and will then be pumped out using submersible or land-based pumps.

The beach wells typically consist of a non-metallic casing, well screen, and vertical turbine pump. It is preferable to locate beach wells as close as possible to the shoreline, which means locating a pump house immediately above the spring high tide mark (Figure 2.7).

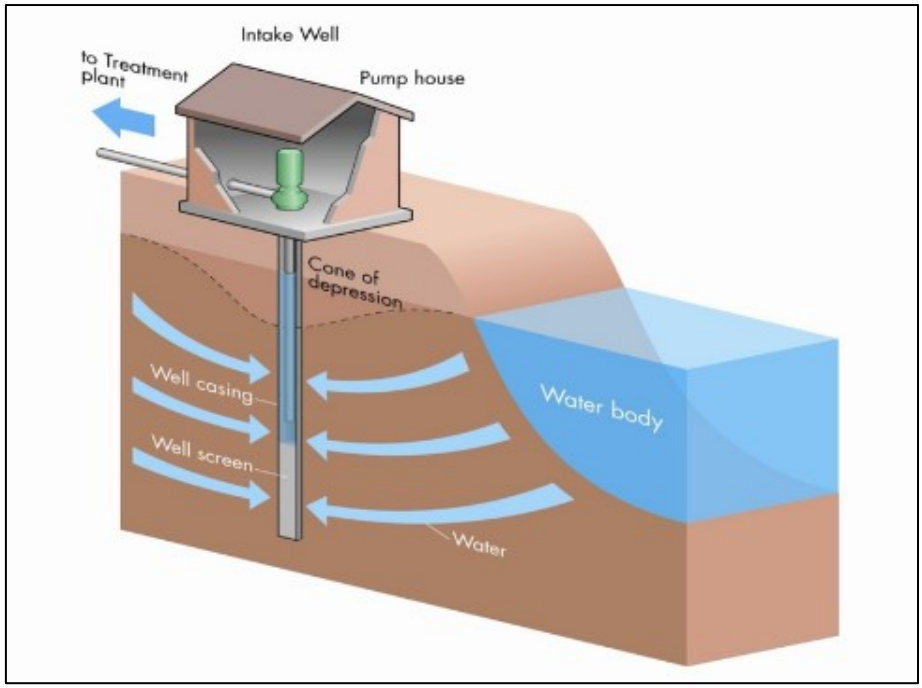


Figure 2.7: Schematic layout of a vertical beach well (Voutchkov, 2011).

Onshore pump station

The onshore raw seawater abstraction system linking to the pump station and end-user (aquaculture or desalination plant), as well as the pump-over scheme's pipe works, will be buried where possible for safety and security reasons.

The facilities required for the pump station are as follows:

- Pump sets, with a separate inlet chamber for each pump;
- Mechanical equipment for seawater screening (mechanical rake screens) and screw conveyors for disposal of screenings to skip;
- Provision for easy access for lifting, transportation and removal of all plant;
- Safe and easy access to the pumping chambers;
- Penstock valves to enable the isolation of each chamber for maintenance purposes;
- Dewatering sumps installed below the lowest floor level in each chamber;
- A superstructure constructed over the pump area;
- All switchgear and control panels and other electrical equipment;
- A permanently installed electrical overhead travelling crane;
- LV MCC switch room; and
- Ventilation room.

2.4.5 WEROP Wave Pump

The WEROP wave pump is a pressure pump technology that makes use of wave energy for the abstraction of water thus eliminating the need for electrical power. This technology will be utilised for pumping smaller volumes of water to the shore either into a sump or directly to the user facility.

The wave pumps use wave energy directly to pre-filter and pump seawater at the requisite pressure to a shore-based end user. The wave pump has a footprint of about 50 m^2 and sits on the seabed at a depth of between -10 and -15 m. The distance offshore would be dictated by the location of the seawater intake point and the topography of the seabed. In the case of the Coega SEZ, this is envisaged to be between 700 m and 1.5 km offshore (Figure 2.8).

The wave pump is secured to the seabed using a variety of methods, depending upon the seabed characteristics. In the case of the Coega SEZ, three options are available but would depend upon the exact location of the wave pumps:

- Sand anchors;
- Rock anchors; or
- Combination of both.

The wave pumps would be assembled within the Port of Ngqura, towed to the site and submerged onto the seabed at the required location.

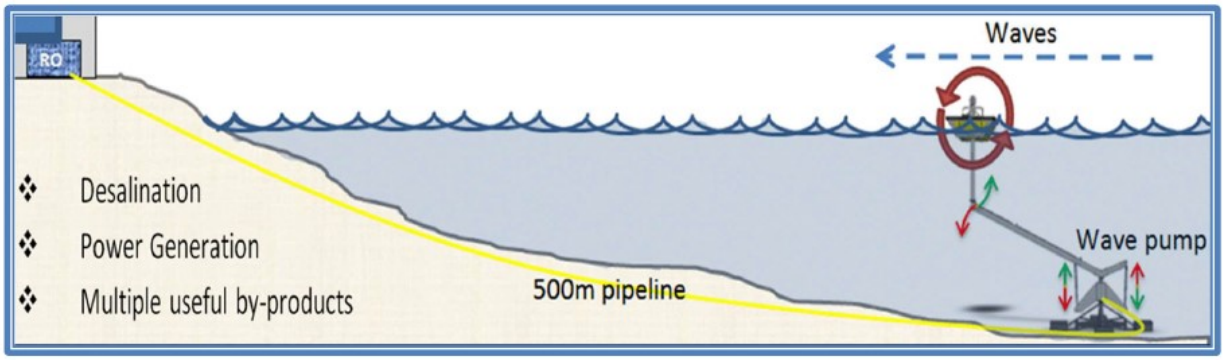


Figure 2.8: Diagram showing offshore wave pumps (Impact Free Water (Pty) Ltd, 2019).

2.4.6 Seawater distribution chamber or reservoir

A seawater distribution chamber or sump will be required close to the shore to supply seawater to the various aquaculture and desalination facilities within the Aquaculture Development Zone (ADZ). The PRDW Concept Design Report (2016) recommended locating the distribution chamber at the lower boundary of the ADZ to accommodate the large seawater supply requirements (5.0 m^3/sec) for the abalone flow-through facilities. The smaller flow demand (0.94 m^3/sec for finfish recirculation system and 2.03 m^3/sec for desalination) is required at elevated altitudes of the ADZ, and would be pumped from the distribution chamber or reservoir to the finfish farms and desalination facility located at the higher elevations.

The seawater distribution chamber or reservoir is located within the ADZ for which Environmental Authorisation (EA) has already been obtained.

2.5 MARINE DISCHARGE SERVITUDES

2.5.1 Discharge volumes

The need for the marine effluent discharge servitudes is mostly driven by a corresponding need of the respective Coega SEZ industries to return mostly seawater effluent used for cooling water and aquaculture, back into the offshore marine environment. Other additional effluent streams include wastewater from the Coega WWTW, brine from the desalination plant and stormwater.

The following **maximum** effluent discharge requirements are projected:

PURPOSE	TYPE OF EFFLUENT	WORSE CASE DISCHARGE FLOW RATES
Cooling water: once-through cooling	Seawater at 28°C and 35 ppt	14.70 m^3/sec
Cooling water: wet mechanical cooling	Seawater at 23°C and 53 ppt	0.30 m^3/sec
Aquaculture flow through system for abalone	Seawater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD.	5.00 m^3/sec
Aquaculture recirculation system for finfish	Seawater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD.	0.94 m^3/sec
Desalination brine	Brine at 60 ppt	1.22 m^3/sec
Wastewater	Treated domestic and industrial wastewater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD, salinity heavy metals and E.coli	0.93 + 0.46 m^3/sec
Stormwater	Rainwater	Uncertain
TOTAL		**23.55 m^3/sec**

One or more of the following technologies will be implemented to discharge the various effluent streams from the various proposed land-based uses into the sea.

2.5.2 Cooling water for Once-Through power stations

The PRDW dispersion modelling report (2020) has determined that the cooling water for the Once-Through Cooling system (14.70 m^3/sec) must be discharged at a distance of 650 m offshore to a depth of -11 m CD in order to meet the applicable water quality guidelines.

The WSP (2020) technical report investigated two types of infrastructure for the discharge of the cooling water, namely:

- Eight (8) metre wide raceway; and
- Three (3) metre diameter tunnel.

Raceway discharge
The possibility of attaching a raceway to the eastern breakwater of the Port was determined to be unfeasible due to the potential risk of compromising the structural integrity of the breakwater. An alternative freestanding raceway was also investigated, such as the one shown in Plate 2.5 below, used at the Koeberg Power Station.

Plate 2.5: Typical outfall raceway found at the Koeberg Nuclear Power Plant (WSP, 2020).

However, the freestanding raceway option would require significant infrastructure, including two lateral breakwaters that would have a large ecological footprint and would also affect sediment movement. Hence, this option was determined to be both financially and ecologically unacceptable for use in the proposed project.

Tunnel discharge

WSP have recommended that a tunnel is the most feasible option for discharging the large volumes of water from a once-through cooling system. Based on the expected discharge volumes, it is projected that a 3,000 mm outer diameter tunnel will be required for this purpose. The length from the high-water mark to offshore would be about 600 m. Beyond this, seabed mounted pipelines may be used for the diffuser section.

The tunnel would consist of a concrete conduit (concrete pipe section installed by means of jacking and a tunnel boring machine from land) as shown in Plate 2.6 below. The concrete would be of suitable mix to ensure its design life is reached, especially considering the warm seawater flowing inside the tunnel.

The tunnel boring and pipe jacking is a large-scale operation requiring a large beach laydown area during construction, as shown in Plate 2.6 below. Pipe jacking would be installed from the land side to the -11 m relief well (offshore retrieval pit) to extract the drilling equipment. It is likely that a marine jack-up barge may be required for this purpose.

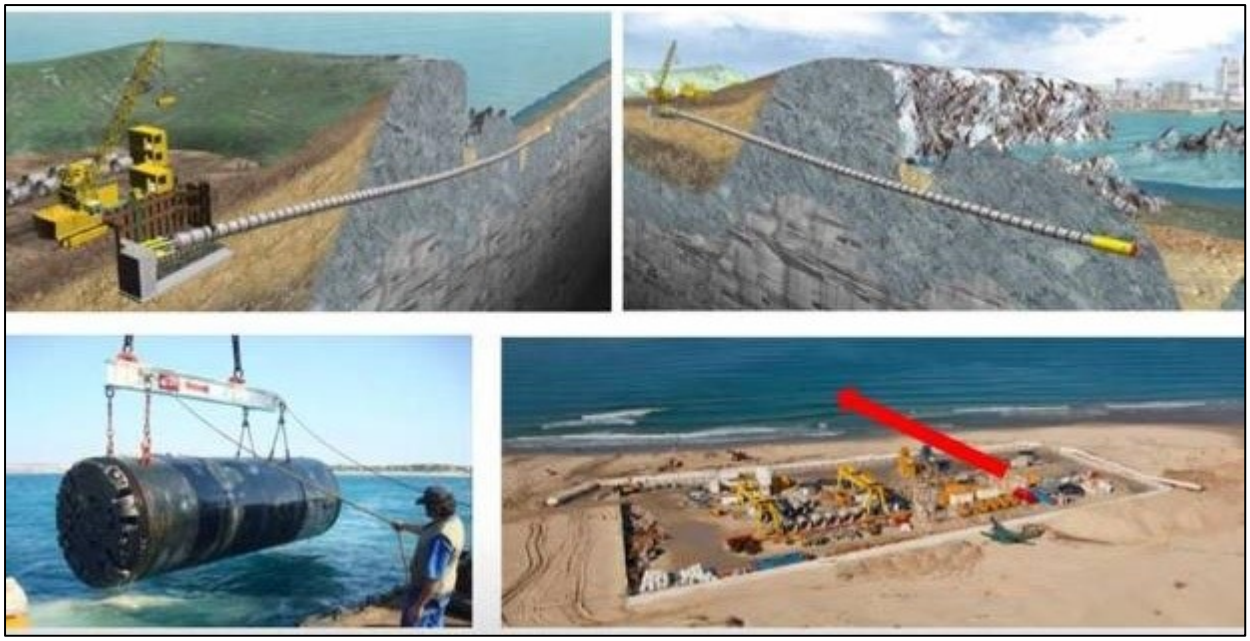


Plate 2.6: Illustration of the on-land launch shaft and jacking process during the tunnelling process (WSP, 2020).

The seaward end of the pipeline or tunnel will have a diffuser section with ports to discharge effluent into the water column at appropriate velocities to promote rapid mixing (see example at Figure 2.9 below).

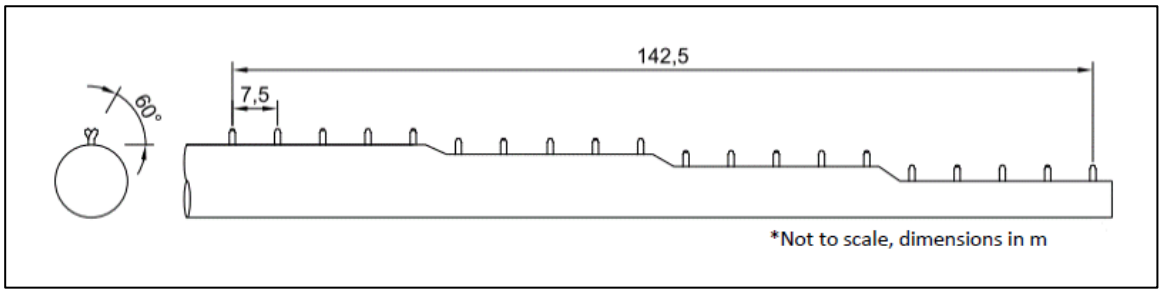


Figure 2.9: Conceptual diffuser section configuration with multiple discharge ports (PRDW, 2020).

2.5.3 Cooling water for Wet Mechanical power stations

The PRDW dispersion modelling report (2020) has determined that the cooling water for two Wet Mechanical Cooling systems (0.54 m^3/sec) (i.e. for two power stations using the Wet Mechanical Cooling technology) must be discharged at a distance of about 650 m offshore to a depth of about -11 m CD in order to meet the applicable water quality guidelines (the same location as the Once-Through Cooling).

The WSP technical report (2020) proposes a pipeline structure for discharging seawater from the Wet Mechanical Cooling power station. This outfall structure would be an HDPE pipeline of about 560 mm diameter for each plant. The pipeline would be designed to lie on the seabed and weighed down by concrete collars as shown in Plate 2.7 below.

Plate 2.7: Example of HDPE pipeline with collars to provide hydrodynamic stability when placed on the seabed (WSP).

Where a pipeline is embedded in the surf zone, a temporary jetty structure would be required during the construction period to provide a safe platform from which excavation could be done to bury the pipeline through the surf zone as shown in Figure 2.10 below.

Figure 2.10: Sheet pile jetty structure to provide access for cranes to excavate pipe burial trench (WSP, 2020).

The pipeline end will be fitted with a diffuser with a number of ports discharging the outflow within the marine environment, in order to improve mixing (similar to that shown in Figure 2.10 above).

2.5.4 Flow through abalone aquaculture effluent

Seawater effluent from the flow-through abalone farms (5.0 m^3/sec) will be discharged directly into the marine environment via an HDPE beach discharge pipeline, with a diameter of about 2,500 mm, into the surf zone. The pipeline would need to be buried across the beach zone. The option of diverting some of the seawater to a desalination facility will also be explored.

2.5.5 Recirculated finfish aquaculture effluent

Recirculated finfish aquaculture effluent (0.94 m^3/sec) from various users will be treated on site by each investor before being discharged to the marine environment via a pipeline. The pipeline would be similar to the seawater abstraction pipeline described above (i.e. embedded in the surf zone and sitting on the seabed beyond the surf zone) and discharged at a distance of about 1,500 m offshore, at a depth of about -16 m below MSL.

Plate 2.8 below provides an example of a discharge pipeline that would be used for finfish effluent discharges.

Plate 2.8: Example of effluent discharge pipeline with concrete collars prior to sinking to the seabed.

2.5.6 Desalination brine discharge

Brine from a 60 Ml/day desalination plant (1.22 m^3/sec) will be discharged directly to the marine environment via a pipeline. The HDPE pipeline will have a diameter of about 700 mm and buried underground on land, and laid on the seabed offshore. It will discharge at a distance of about 1,000 m offshore at a depth of about -14 m CD.

2.5.7 Wastewater Treatment Works

Treated industrial and domestic wastewater from the proposed Coega Wastewater Treatment Works (WWTW), totalling 1.4 m^3/sec, will be discharged directly into the marine environment via a pipeline. The pipeline would be similar to the brine discharge pipeline described in Section 2.3.5 of this report, discharging at a distance of about 3,000 m offshore at a depth of about -20 m CD.

The outfall structure for the wastewater would be an HDPE pipeline of about 700 mm diameter. The pipeline would be designed to lie on the seabed and weighed down by concrete collars as shown in Figure 2.11 below. The structure would be assembled in the Port, floated out to the site and submerged. The section through the surf-zone would either be embedded in trenches or routed underneath the surf zone using directional drilling technologies.

The seaward end of the pipeline would have a diffuser section with ports to discharge effluent into the water column at appropriate velocities to promote rapid mixing (see example in Figure 2.11 below).

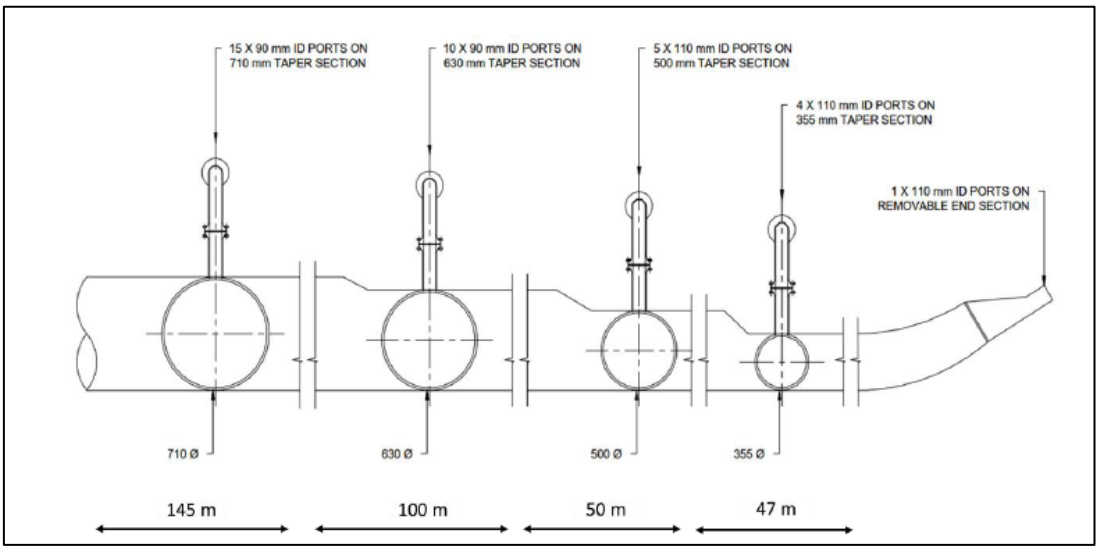


Figure 2.11: Example of diffuser section of a wastewater pipeline with multiple discharge ports.

2.5.8 Stormwater discharge infrastructure

Information on the stormwater management requirements was provided by the CDC. The main objective of the stormwater outlet structures is the dissipation of energy and prevention of erosion during rain events. The secondary objective is to collect waste that might wash down the stormwater pipes/channels.

2.5.8.1 Structure location

The three stormwater structures will be located along the shoreline of Zone 10, at a level of 7 m above MSL in order to prevent it from being damaged during high tide and storm events (Figure 2.12). Discharges from the three stormwater outlets will correspond with the following servitudes:

- Discharge servitude 2: Brine, finfish and wastewater effluent;
- Intake servitude 2: Desalination and aquaculture (i.e. in the same servitude as the intake); and
- Discharge servitude 3: Abalone effluent.

The final positions will be established on site in order to consider specific site conditions / restrictions (i.e. micro-siting).

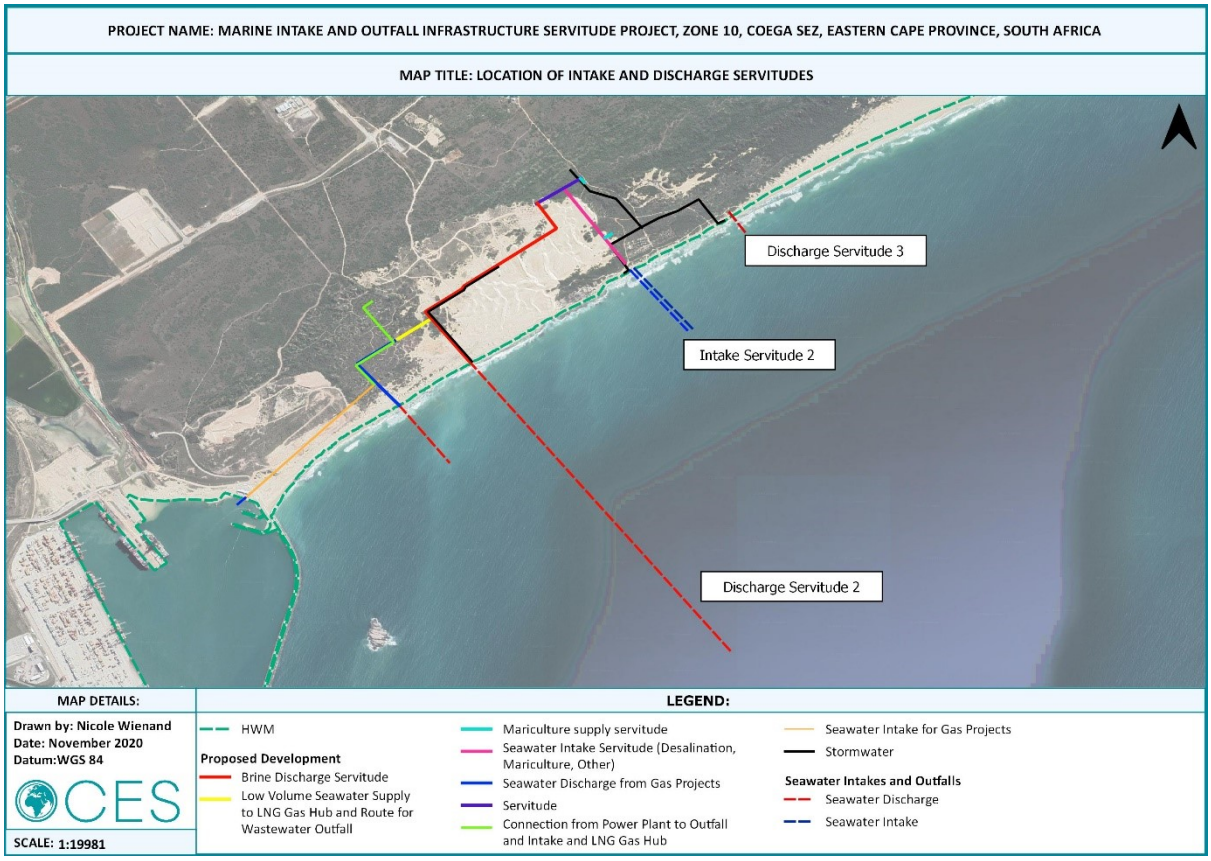


Figure 2.12: Proposed Location of Intake and Discharge Servitudes.

2.5.8.2 Design

Due to the sensitive location of the stormwater outlets, it has been decided to utilise gabions to form the structure instead of reinforced concrete, as it would be less visually intrusive in the natural coastal environment in Zone 10. The design will also involve planting appropriate vegetation to improve the aesthetic appearance of the structures.

The outlet structure will be installed at a maximum slope of 1:100. The inlet channel profile will be increased to reduce inflow velocity into the structure (Figure 2.14). The flow pattern will further reduce velocity and dissipate energy, while allowing for debris/waste to settle/get trapped on the outsides of the channel through the structure. During extreme rainfall events the water will overtop the baffle gabions if required, while flow velocity would be reduced and energy dissipated. The capacity of the structure is designed for a 1:5-year return period storm, without overtopping the baffle gabions. The outlet Reno Mattress can be extended to the highwater mark to prevent beach erosion. Figure 2.13 and Figure 2.14 provides detailed designs for the stormwater discharge structures.

Figure 2.13: Proposed Location of three (3) stormwater discharges into the sea.

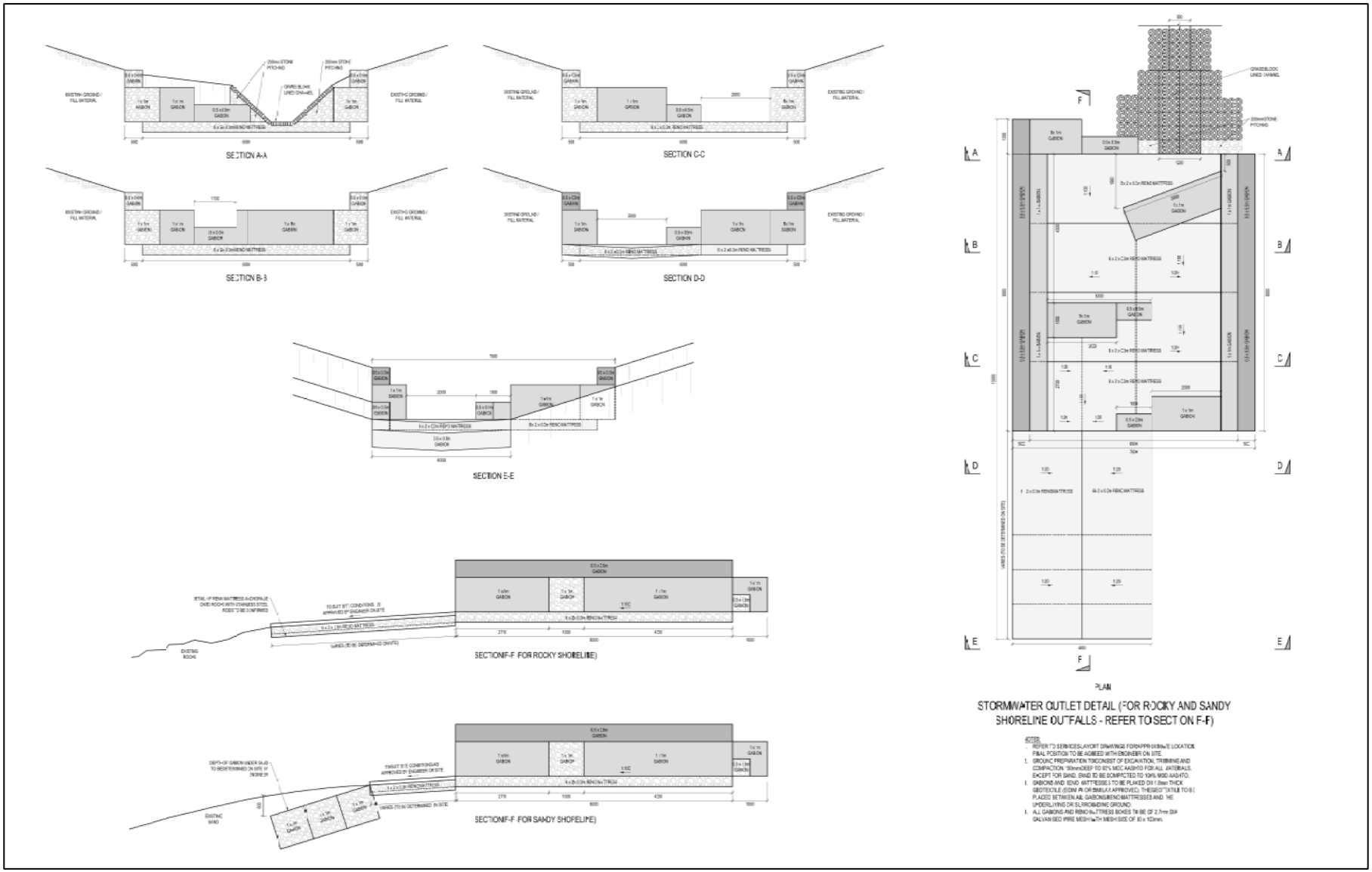


Figure 2.14: Typical details of stormwater structures provided by the CDC.

2.6 ALTERNATIVES

2.6.1 Background

This section provides an assessment of the various alternatives associated with the proposed establishment of marine servitudes for seawater abstraction and effluent discharge (including return cooling / heating and aquaculture seawater, brine, treated wastewater and stormwater) adjacent to the Coega SEZ, and outlines the process informing the identification of the **preferred alternative(s).**

With respect to the consideration of alternatives, Regulation 2 (1) of Appendix 2 in the EIA Regulations states the following:

> "A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include:
>
> (g) A full description of the process followed to reach the proposed **preferred activity, site and location** of the development footprint within the site, including:
>
> (i) Details of all the alternatives considered;
>
> (iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
>
> (v) The impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified 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;
>
> (vi) The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;
>
> (vii) 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;
>
> (viii) The possible mitigation measures that could be applied and level of residual risk;
>
> (ix) The outcome of the site selection matrix;
>
> (x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and
>
> (xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity."

2.6.2 Reasonable and Feasible Alternatives

The identification of alternatives is a key aspect of the EIA process. In relation to a proposed activity, "alternatives" mean different ways of meeting the general purposes and requirements of the proposed activity. Most guidelines use terms such as "reasonable", "practicable", "feasible" or "viable" to define the range of alternatives that could be considered.

There are three broad types of alternatives that need to be considered:

Fundamental alternatives
Fundamental alternatives are developments or activities that are substantially different from the proposed project description and usually include the following:

- Alternative type of activity to be undertaken; and
- Alternative location where the proposed activity will be undertaken.

Incremental alternatives
Incremental alternatives relate to modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. There are several incremental alternatives that can be considered with respect to the current project, including:

- Alternative design or layout of the activity;
- Alternative technology to be used in the activity; and
- Alternative operational aspects associated with the activity.

No-go alternative
It is mandatory to consider the "no-go" alternative in the EIA process. The "no-go" alternative refers to the continuation of the existing land or sea use, i.e. maintain the current status quo and the risks and impacts associated with it. Some existing activities may carry risks that may be undesirable (e.g. an existing contaminated site earmarked for a development).

For clarity and to avoid confusion, the assessment of alternatives for this project is divided into two broad categories, namely:

- Marine intake servitudes for seawater abstraction; and
- Marine outfall servitudes for effluent discharges.

2.6.3 Analysis of Marine Intake Servitude Alternatives

VOLUME REQUIREMENTS

A detailed motivation for the need to source seawater for various land-based industries in the Coega SEZ is provided in Section 1.5 of this report.

The need for the marine seawater abstraction servitudes is driven by the following water requirements for the industries that will potentially be established within the Coega SEZ:

- Cooling water for two 1000 MW LNG power stations for which the EIA is currently in progress.
- Land based aquaculture (including >40,000 tonnes / year of abalone and finfish). Environmental Authorisation was received on the 7th of February 2018.
- The Coega Aquaculture Development Zone (ADZ) includes the development of a seawater desalination plant with a maximum capacity of 60 Mℓ / day. Environmental Authorisation was received as part of the authorisation for the aquaculture development zone on 07 February 2018.

Information relating to the seawater requirements is based on input from the following sources: CES (2015), Carnegie Energy (2019), WSP (2020), Ethical Exchange (2017) and SRK (2020). There has also been *ad hoc* communication with various relevant industry specialists and CDC personnel to confirm seawater volume requirements.

Based on the various inputs, the following **maximum** seawater intake requirements are projected:

Purpose	Worse case intake flow rates
Cooling Water: Once-Through Cooling	14.70 m^3/sec
Cooling Water: Wet Mechanical Draft Cooling	0.42 m^3/sec
Aquaculture flow through system for abalone	5.00 m^3/sec
Aquaculture recirculation system for finfish	0.94 m^3/sec

Purpose	Worse case intake flow rates
Seawater Desalination Plant	2.03 m^3/sec
Total	**23.09 m^3/sec**

ALTERNATIVE TYPE OF ACTIVITY

Section 1.5 provides a motivation for the need for abstracting seawater for various proposed Coega SEZ industries, including:

- Cooling water for the power station hub to provide tenants with secure access to energy and contribute to broader energy security in South Africa;
- Desalination to supplement freshwater supply from the NMBM and to provide tenants with secure access to freshwater in a water stressed region; and
- Seawater for marine aquaculture to promote local food security and export products.

The following sections provide an explanation and rationale as to why the abstraction of seawater is the **only reasonable and feasible alternative for securing water** for the various water requirements at the Coega SEZ.

Cooling water for power stations

An initial PRDW (2017) dispersion modelling report was based on a projected flow rate of 45 m^3/sec to cool three 1,000 MW power stations using the Once-Through Cooling system. However, the more recent WSP (2020) technical report has recommended a mixture of various alternative power station cooling technologies in addition to the Once-Through Cooling system, that require less or no water at all. These include:

- Wet mechanical system - 0.42 m^3/sec per 1,000 MW unit; and
- Air cooled system - no water required.

The WSP report (2020) provides a comparative modelling analysis of the various power station cooling technical options based on pumping requirements to the various elevations and distances of the three proposed power station locations, and net technical efficiencies. The report determined the following to be the most feasible options:

- Once-through seawater cooling option for Zone 10 South;
- Wet mechanical cooling for Zone 10 North; and
- Air cooling for Zone 13 (no water required).

Based on the above, the total maximum seawater requirements for power station cooling will be 14.7 m^3/sec, reduced from an initial 45 m^3/sec as per the PRDW (2017) Report. This is significantly lower than operating all three power stations using the Once-Through Cooling system, and hence these alternatives have reduced the potential environmental impacts of sea water abstraction. However, it is not feasible or possible to source the required volumes of cooling water from freshwater sources such as boreholes and municipal water, and it would be environmentally unacceptable to do so in a water stressed area.

Recycling of cooling water is a further option that required consideration. This was the rationale behind considering the Wet Mechanical Cooling technology option. However, the trade-off for this option is that it requires significant land to construct the water recycling infrastructure. The recycling of water used for Wet Mechanical Cooling would require significant land for constructing holding dams at a much greater additional capital cost. Thus, the use of both these options has been recommended for two of the power stations, with the trade-offs being reduced seawater abstraction balanced against reduced land requirements and costs.

Conclusion: The only feasible alternative for sourcing cooling water, is to abstract the required water from the ocean.

Desalination

The Coega SEZ currently sources its potable water supply from the NMBM water supply network. The NMBM purchases water from the Department of Water and Sanitation (DWS), which is supplied from the Orange River Water Scheme. The CDC has been investigating the feasibility of developing a desalination facility to supplement the current NMBM supply, to provide tenants with a secure supply of freshwater for various industrial purposes. Environmental authorisation for the development of a desalination plant to supplement water supply from the NMBM, was approved in 2018. The desalination project will follow a phased approach and will start with an initial capacity of 15 Mℓ/day of potable water, ramping up incrementally to 60 Mℓ/day.

Conclusion: Based on the above, there are no other feasible options for supplementing the existing fresh water supply from the NMBM in a water stressed region, other than sourcing seawater from the ocean for desalination.

Land-based marine aquaculture

The establishment of an Aquaculture Development Zone (ADZ) within Zone 10 of the Coega SEZ has been in planning over a number of years. The economic motivation for the establishment of a 440 Ha and 42,370 tonnes per annum ADZ is provided in the CES feasibility study conducted in 2015. Consequently, the CDC progressed the ADZ concept and obtained environmental authorisation for the development of the ADZ in 2018.

With respect to the potential for recycling aquaculture seawater, the proposed Coega ADZ finfish aquaculture concept is based on the well-advanced recirculation technology, where up to 90% of the abstracted seawater is recycled using various filtration and treatment processes such as biofilters. In contrast, the abalone aquaculture has proven only to be feasible using a flow-through system.

The manufacture of seawater for culturing marine species has been attempted but with little success. In this instance, access to large volumes of freshwater would be needed, which would be problematic within the water constrained Coega area.

Conclusion: Based on the above information there are no other reasonable or feasible types of activities for sourcing large volumes of water for the aquaculture industry within the SEZ, other than sourcing the required water from the sea.

Overall conclusion

The **preferred alternative activity** is to establish marine intake servitudes alongside the Coega SEZ for the worst-case seawater abstraction requirements listed above. Alternative activities other than the establishment of a marine intake servitude for abstracting seawater from the ocean, are not considered to be reasonable or feasible.

ALTERNATIVE LOCATIONS FOR THE PROPOSED ACTIVITY

This assessment addresses the alternative locations for the proposed abstraction of seawater adjacent to the Coega SEZ.

The identification and assessment of reasonable or feasible marine intake servitude alternatives for abstracting seawater has been an iterative process over a number of years. Pre-feasibility engineering studies (PRDW 2016, for aquaculture) and site selection risk assessment studies (PRDW, 2017) assessed a number of alternative locations for the proposed marine intake servitudes.

PRDW 2016 Concept Design Report

The 2016 PRDW Concept Design Report assessed three (3) broad "*locations*" for the abstraction of seawater for aquaculture (i.e. it did not consider the power station cooling water requirements, as this project had not been conceptualised at that time). These included:

1. East of the Port of Ngqura;
2. In the vicinity of the Port of Ngqura, and;
3. West of the Port of Ngqura.

The conclusion was that locating an intake servitude east of the Port of Ngqura is the most feasible alternative mostly due to the significant economic advantages associated with abstracting seawater closer to the aquaculture zone.

PRDW 2017 Dispersion Modelling Report

The 2017 PRDW Dispersion Modelling Report assessed six (6) locations for the proposed seawater abstraction or intake points, with a view to identifying common seawater intake servitudes. Compared with the 2016 PRDW Concept Design Report, this analysis also included cooling water. The six locations included (refer to Figure 2.15 below):

- W1 - Western intake at -10 m Chart Datum (CD)
- W2 - Western intake at -16 m CD
- CW - Cooling water intake inside the Port of Ngqura
- CB1 - Cerebos intake within the Port of Ngqura
- CB 2 - Cerebos intake at Sundays River Mouth
- E1 - Eastern intake at -10 m CD

The following conclusions were arrived at with respect to the preferred marine intake servitude locations, considering the results for the recommended outfall locations, where intakes were identified to prevent recirculation of effluent into the intake seawater:

- W1, W2 and CB2 were identified as **'not viable'** for seawater intake due to the large volumes of water required for cooling water and aquaculture development and the long distance of these sites from the power station sites and aquaculture zone, resulting in significantly higher economic costs due to the much longer reticulation distance.
- CW and CB1 were considered **'potentially viable'** if separate aquaculture and cooling water intakes are constructed, as the quality of the seawater within the Port of Ngqura is not suitable for aquaculture.
- E1 was considered **'potentially viable'** since the required effluent dilutions can be achieved, but still subject to the outcome of the marine ecological impact assessment in the EIA phase.

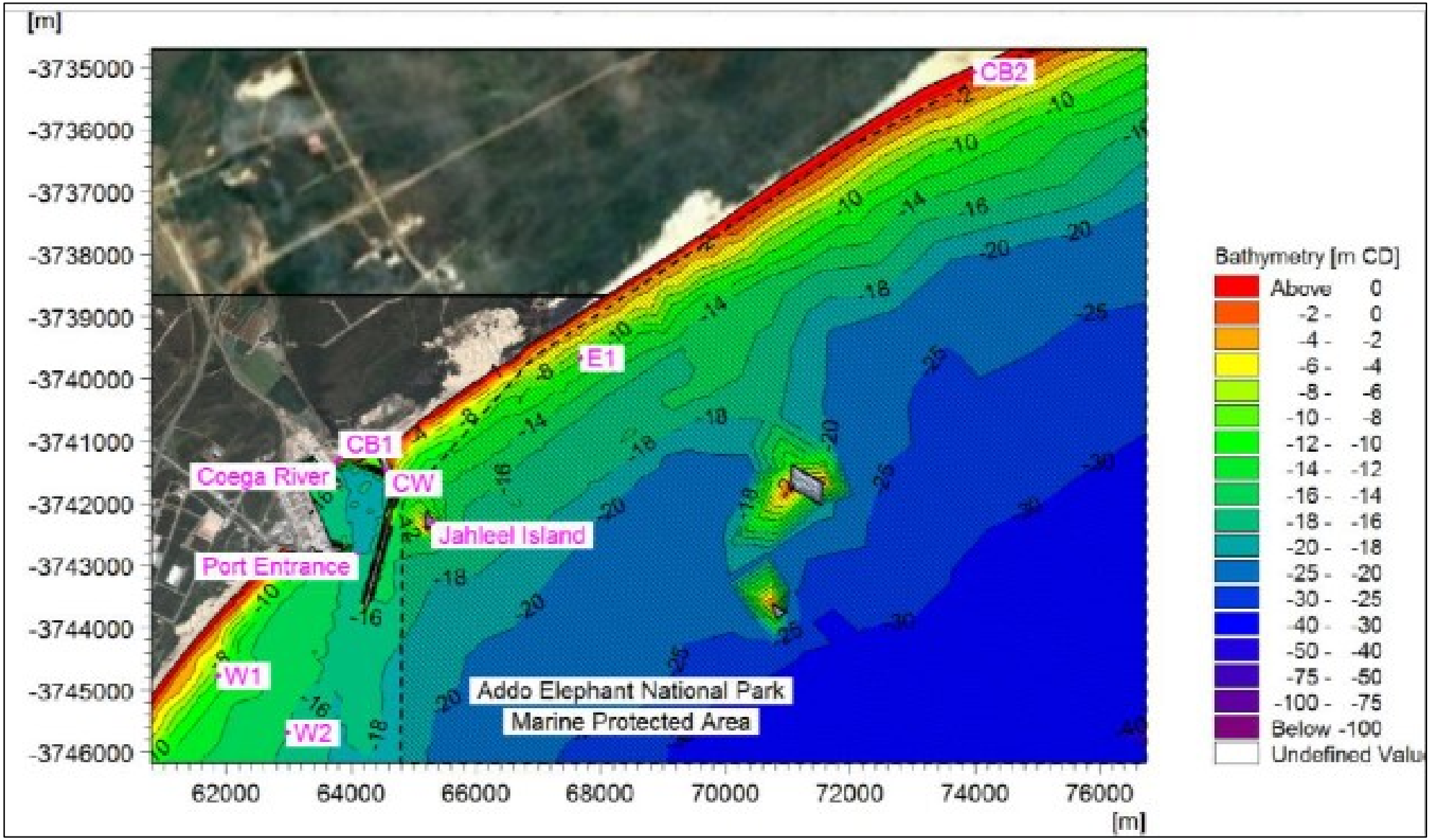


Figure 2.15: Location of intakes and sensitive receptors (PRDW, 2017).

Impact risk assessment for alternative intake locations

A high-levelled risk assessment was conducted to assess the six (6) potential seawater intake servitude locations.

The following list of environmental, social and economic impacts or risks were identified and considered with respect to determining the preferred seawater intake locations.

- Geographical location;
- Physical conditions (e.g. water quality);
- Terrestrial ecology;
- Marine ecology;
- Social;
- Socio-economic;
- Economic;
- Heritage & cultural;
- Technical;
- Climate change mitigation; and
- Climate change adaptation.

The risks were also considered with respect to the design, construction operation and decommissioning project phases.

Table 2.2 below provides the results of the high-level risk assessment in the form of a screening matrix of the six (6) potential seawater intake servitude locations. It takes into consideration the impact assessment and mitigation hierarchy, including:

- The nature of potential impacts including significance, consequence, extent, duration and probability; and
- Reversible, irreplaceable loss, can be avoided, managed or mitigated.

Table 2.2: High-levelled environmental, social and economic risk assessment screening matrix for alternative seawater intake servitude locations.

ENVIRONMENTAL ATTRIBUTES	SEAWATER INTAKE LOCATION ALTERNATIVES					
	Western intake at -10 m CD	Western intake at -16 m CD	Cooling water intake inside Port	Cerebos intake within the Port	Cerebos intake Sundays River Mouth	Eastern intake at -10 CD
Geographical location	Not preferred	Not preferred	Preferred	Acceptable	Not preferred	Preferred
Physical conditions (e.g. water quality)	Acceptable	Acceptable	Acceptable	Not preferred	Acceptable	Preferred for aquaculture
Terrestrial ecology	Not preferred	Not preferred	Preferred	Acceptable	Not preferred	Preferred
Marine ecology	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
Social	Not preferred	Not preferred	Acceptable	Acceptable	Not preferred	Acceptable
Socio-economic	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
Economic	Not preferred	Not preferred	Preferred	Acceptable	Not preferred	Preferred
Heritage & cultural	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
Technical	Acceptable	Acceptable	Acceptable for cooling	Acceptable	Acceptable	Acceptable
Climate change mitigation	Not preferred	Not preferred	Preferred	Acceptable	Not preferred	Preferred
Climate change adaptation	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable

Table 2.3 below summarises the results of the risk assessment.

Table 2.3: Results of a high-level risk assessment completed for the six potential locations of the marine intake servitude.

Abstraction location	Conclusion (Advantages / Disadvantages)	Reasonable and feasible
Western intake at -10 m and -16 m CD	**Geographical location:** Abstraction from the west of the Port is a long distance from the point where the seawater is required in Zone 10. **Terrestrial ecology:** The reticulation of seawater around the Port from the west to the east along the N2 (a distance of about 12 km), poses higher risks to the terrestrial environment along the route, such as disturbance to vegetation and risk of seawater leakages along the route. **Social:** Large volumes of electricity would be required to pump seawater from the west of the Port to Zone 10 east of the Port. Currently the country is experiencing energy crises and any avenues to save energy should be considered. **Economic**: The capital and operational costs associated with conveying large volumes of abstracted seawater a long distance around the Port to the power stations and desalination and aquaculture facilities in Zone 10 (a distance of about 12 km), would not be economically feasible. **Climate change:** The carbon footprint associated with pumping seawater from the west of the Port to Zone 10, would be significant over the life of the project.	**NO**
Cooling water intake inside Port	**Marine ecology:** Since the cooling of the power stations requires the largest volumes of seawater and is not dependent on the quality of the seawater, water for this purpose can be abstracted from the Port, where it would have a lower environmental impact.	**YES** but only for cooling water, as water quality in the Port is not suitable for aquaculture
Cerebos intake within the Port	To ensure that there are no impacts on Cerebos, it was determined that a shared intake between the two industries would not be viable in this instance.	**NO**
Cerebos intake Sundays River Mouth	**Geographical location:** Abstraction from the Sundays River is a long distance from the point where the seawater is required in Zone 10. **Terrestrial ecology:** The reticulation of seawater from the Sundays River to Zone 10 east of the Port, possibly along the N2 (a distance of about 15 km), poses higher risks to the terrestrial environment along the route, such as disturbance to vegetation and risk of seawater leakages along the route.	**NO**

Abstraction location	Conclusion (Advantages / Disadvantages)	Reasonable and feasible
	Social: Large volumes of electricity would be required to pump seawater between the Sundays River and Zone 10. Currently the country is experiencing energy crises and any avenues to save energy must be considered. **Economic**: The capital and operational costs associated with conveying large volumes of abstracted seawater from the Sundays River to the power stations and, desalination and aquaculture facilities in Zone 10 (a distance of about 15 km) would not be economically feasible. **Climate change:** The carbon footprint associated with pumping seawater from Sundays River to Zone 10, would be significant over the life of the project.	
Eastern intake at -10 m CD	**Geographical location:** Abstraction from the east of the Port is geographically closer to the location where the seawater is required. **Water quality:** Aquaculture and desalination require a higher seawater quality and abstraction from the Port would not be a viable option. Hence, an open sea intake in close proximity to the approved aquaculture zone (i.e. east of the breakwater) is preferred. **Terrestrial ecology:** The shorter distance for the reticulation of seawater to the point of use, poses a lower risk to the terrestrial environment along the route, such as disturbance to vegetation and risk of seawater leakages along the route. **Economic**: The capital and operational costs associated with conveying large volumes of abstracted seawater from the east of the Port, would be much lower over the life of the project, compared with pumping seawater around the Port from the west. **Climate change:** The carbon footprint associated with pumping costs from the east of the Port would be much lower over the life of the project, compared with pumping seawater around the Port from the west.	**YES**

Conclusion

The **preferred alternative for the location of the marine intake servitude** is to construct two (2) separate seawater intake servitudes:

- Intake servitude 1: Seawater for Once-Through Cooling and Wet Mechanical Cooling located inside the Port of Ngqura; and
- Intake servitude 2: Seawater for aquaculture and desalination located to the east of the Port of Ngqura.

SPECIFIC LOCATIONS, LENGTH AND WIDTH OF THE SERVITUDES

This section provides an assessment of the more specific locations of the two intake servitudes identified in Section 2.5.3, namely:

- Intake Servitude 1: Inside the Port of Ngqura for cooling water; and
- Intake Servitude 2: East of the Port of Ngqura for aquaculture and desalination.

Similar to the determination of the preferred broader geographical locations, the layout of the two proposed intake servitudes is informed by the positions of the proposed outfall locations, as the intakes need to be located where there are no risks of recirculation of effluent into the proposed intakes.

The proposed layout of the two seawater intake servitudes is mostly informed by the results of the more recent 2020 PRDW dispersion modelling report, where the layout is significantly based on the effluent discharge modelling for the worst-case discharge scenario. Figure 2.16 below shows the proposed servitude positions on the shoreline, discharge distances offshore and depth of abstraction. It is also proposed that a maximum servitude width of 200 m is established to accommodate the various abstraction technologies.

Conclusion

The **preferred alternative for specific locations** of the two intake servitudes based on the worst-case abstraction scenario, includes:

- Intake servitude 1: Inside the Port (for cooling water only) with a servitude radius of 100 m; and
- Intake servitude 2: East of the Port (for combined aquaculture and desalination) with a servitude width of 200 m to a distance of 600 m offshore and to a depth of -10 m CD.

ALTERNATIVE DESIGN AND TECHNOLOGY TO BE USED IN THE ACTIVITY

Cooling water

The different seawater intake infrastructure designs and technologies for the abstraction of cooling water are described in the WSP Technical Report (2020) as also described in the Project Description in Section 2 (i.e. intake basin and pipeline jetty). Within the cooling water intake servitude both technologies will be utilised. These include:

- An intake basin comprising four or more parallel concrete intake channels located inside the Port of Ngqura will be required for the Once-Through Cooling system, requiring large volumes of seawater.
- An intake pipeline comprising a jetty located inside the Port of Ngqura will be required for the Wet Mechanical Cooling system requiring much lower volumes of cooling seawater.

Aquaculture and desalination

Details on designs and technologies that will be used for abstracting seawater for aquaculture and desalination are provided by the PRDW Conceptual Design Report (2016) and CDC personnel, respectively.

The following seawater intake designs and technologies will be utilized for aquaculture and desalination:

- An intake pipeline or pipeline tunnel will be required for high volumes of seawater for desalination and a flow-through system for abalone aquaculture; and
- Vertical beach wells will be required for the finfish aquaculture recirculation system.

A further technology to be included is the WEROP wave pump technology which would be located at the point of intake of the desalination intake pipeline and would facilitate the pumping of seawater to the shoreline.

Conclusion
The **preferred alternative design and technology,** based on the worst-case abstraction scenario, includes:

- **All** feasible seawater intake infrastructure design and technology options (i.e. intake basin, pipeline, jetty, WEROP wave pumps, pipeline tunnel and vertical beach wells).

Consequently, impacts relating to **All** the "worst-case" intake design and technology options will be assessed in the EIA.

SUMMARY OF PREFERRED SEAWATER INTAKE SERVITUDE ALTERNATIVE

The following table provides a summary of the **preferred seawater intake servitude alternative**, which includes two separate servitudes which will be assessed in the EIA. No other alternatives will be assessed (except for the no-go alternative), since there are no other reasonable and feasible alternatives.

Alternative category	Preferred alternative	
Servitude	**Intake servitude 1**	**Intake servitude 2**
Activity	• Abstraction of seawater from the sea for Once-Through and Wet Mechanical Cooling of power stations.	• Abstraction of seawater from the sea for land-based aquaculture and desalination.
Broad geographical location	• Cooling water intake servitude inside the Port located at the root of the eastern breakwater as indicated in PRDW map (Figure 2.18).	• Combined aquaculture and desalination water intake servitude located east of the Port as indicated in PRDW map (Figure 2.18).
Specific location	• Servitude radius of 100 m and a depth of -6 m CD.	• Servitude width of 200 m to a distance of 600 m offshore and a depth of -10 m CD.
Design and Technology	• Once-Through Cooling water intake basin with four concrete channels each 3.5 m wide. • Wet Mechanical Cooling water intake jetty with a 710 mm HDPE pipe.	• Desalination – up to three 1,000 mm diameter HDPE intake pipes; • Aquaculture – up to three 1,600 mm diameter pipeline tunnels; • Vertical beach wells; • WEROP wave pumps; and • Stormwater gabions.

Figure 2.16 below shows the broad locations of the preferred intake servitude alternative comprising two intake servitudes.

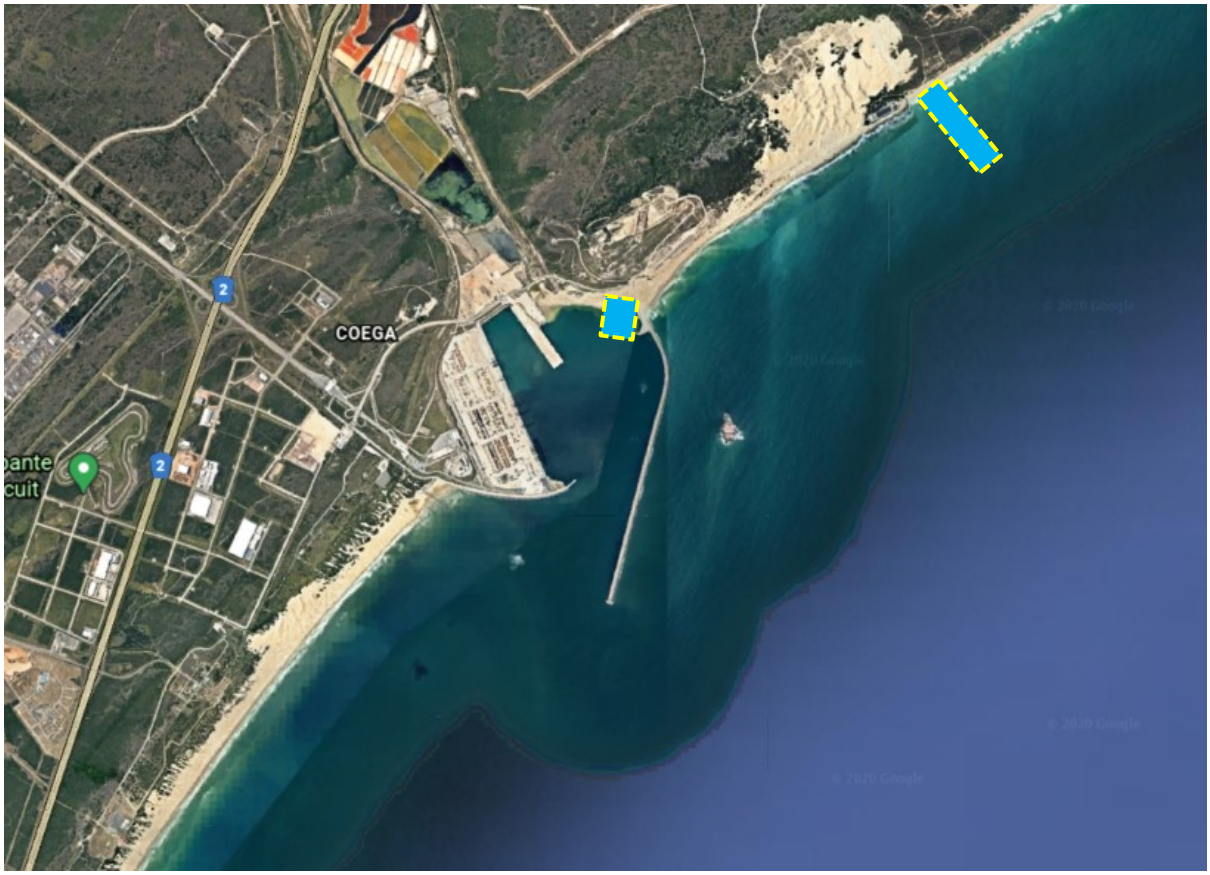


Figure 2.16: Broad locations of the preferred marine intake servitude alternative comprising two (2) intake servitudes.

2.6.4 Analysis of Effluent Discharge Servitude Alternatives

This section addresses the assessment of the alternatives for effluent discharge servitudes.

A detailed motivation for the need to source seawater for various land-based industries in the Coega SEZ is provided in Section 1.5 above.

ALTERNATIVE TYPE OF ACTIVITY

The need for the marine effluent discharge servitudes is mostly driven by a corresponding need of the respective Coega SEZ industries to return effluent seawater back into the offshore marine environment, including cooling water and aquaculture effluent. Other effluent streams include brine from the seawater desalination plant, treated wastewater and stormwater.

The following **maximum** effluent discharge requirements are projected:

Purpose	Type of effluent	Worst-case discharge flow rates
Cooling water: once-through cooling	Seawater at 28°C and 35 ppt	14.70 m^3/sec
Cooling water: wet mechanical cooling	Seawater at 23°C and 53 ppt	0.30 m^3/sec
Aquaculture flow through system for abalone	Seawater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD.	5.00 m^3/sec
Aquaculture recirculation system for finfish	Seawater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD.	0.94 m^3/sec
Desalination brine	Brine at 60 ppt	1.22 m^3/sec
Wastewater	Treated domestic and industrial wastewater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD, salinity heavy metals and E.coli	0.93 + 0.46 m^3/sec
Stormwater	Rainwater	Uncertain
TOTAL		**23.55 m^3/sec**

The same explanation and rationale provided above for determining the **preferred activity** relating to intake servitudes, is also applicable in informing the need for the effluent discharge servitudes.

Conclusion

The **preferred alternative activity** is the establishment of marine discharge servitudes adjacent to the Coega SEZ. Alternative activities other than the establishment of marine servitudes for the discharge of effluent into the ocean, are not considered to be reasonable or feasible.

ALTERNATIVE LOCATIONS FOR THE PROPOSED ACTIVITY

This section addresses the preferred alternative locations for the discharge of various effluent streams into the sea adjacent to the Coega SEZ.

The identification and assessment of reasonable or feasible marine servitude alternatives for discharging effluents into the sea has been an iterative process over a number of years. Pre-feasibility engineering studies (PRDW 2016, for aquaculture) and site selection risk assessment studies (PRDW, 2017) assessed a number of alternative locations for the proposed marine effluent discharge servitude(s).

PRDW 2016 Concept Design Report

The 2016 PRDW Concept Design Report assessed three (3) broad "*locations*" for the discharge of aquaculture effluent (i.e. it did not consider the power station cooling water requirements, as this project had not been conceptualised at this time). These included:

1. East of the Port of Ngqura;
2. In the vicinity of the Port; and
3. West of the Port.

The conclusion was that locating the effluent discharge servitudes east of the Port of Ngqura was the most feasible alternative mostly due to economic benefits associated with discharging the effluent closer to its source in the aquaculture zone located in Zone 10 of the Coega SEZ, east of the Port.

PRDW Dispersion Modelling 2017

In 2017, PRDW conducted a marine dispersion modelling exercise where 12 marine effluent discharge scenarios were developed and then modelled for the defined range of potential effluents. In addition to these 12 scenarios, 3 more scenarios were inferred from results of the modelled scenarios from six (6) sites (Figure 2.16):

- *Option 1* – Approximately 2 km south-west of the western breakwater, at 10 m depth;
- *Option 2* – Approximately 2 km south-west of the western breakwater, at 16 m depth;
- *Option 3* – Along the seaward side of the eastern breakwater, with the discharge point at the elbow of the breakwater;
- *Option 4* – Along the seaward side of the eastern breakwater, with the discharge point at the end of the breakwater;
- *Option 5* – Approximately 900 m to the north-east parallel to the eastern breakwater, at 10 m depth; and
- *Option 6* – Approximately 900 m to the north-east parallel to the eastern breakwater, at 20 m depth.

Figure 2.17 shows the location of the various discharge options that were modelled.

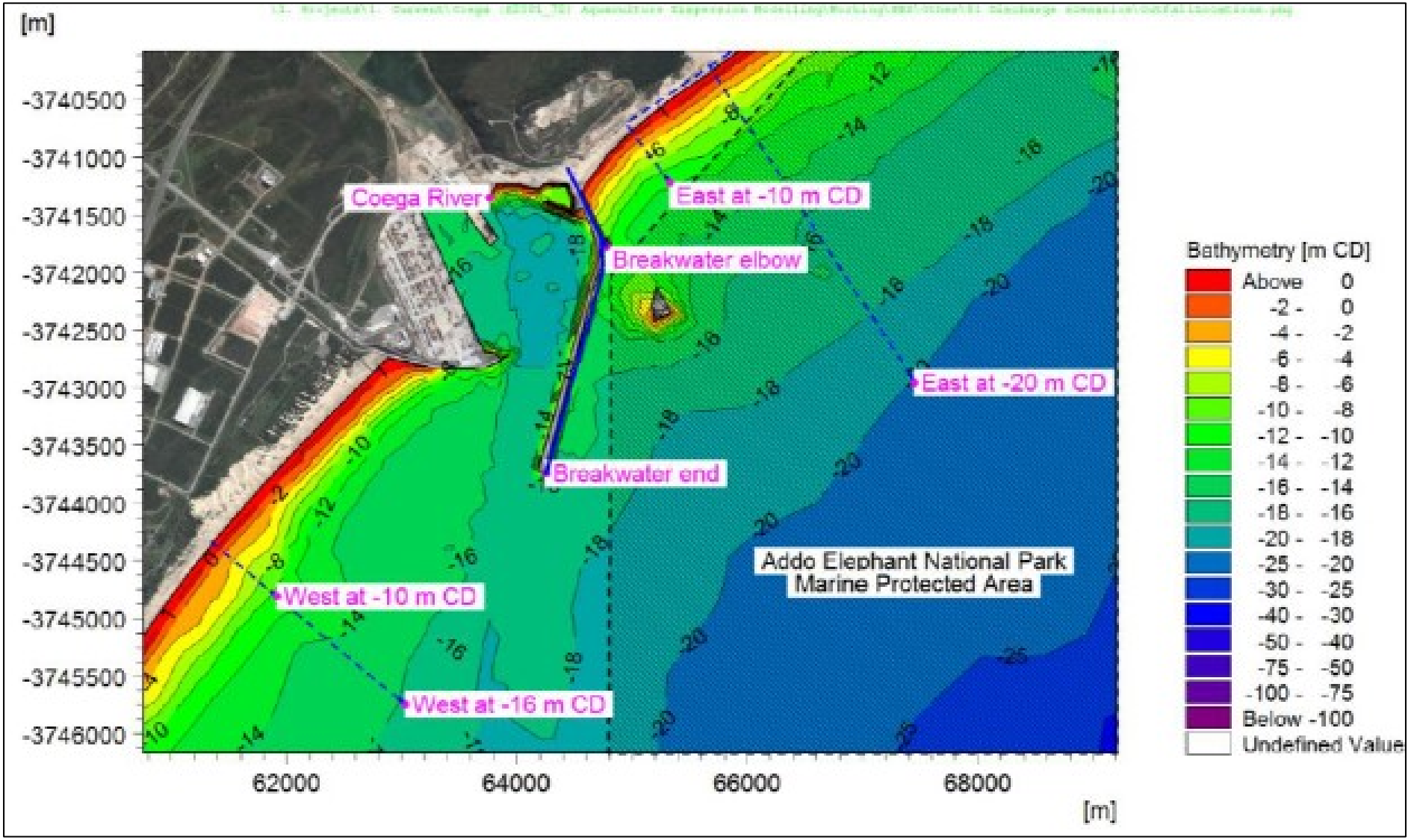


Figure 2.17: Location of modelled discharge outfalls (PRDW, 2017).

The dispersion modelling analysed the mixing zones of 100 m and 300 m from the discharge point. Water quality guidelines were also applied at locations of sensitive receptors, including the boundary of the Addo Elephant Marine Protected Area (MPA), 300 m from the boundary of the MPA, Jahleel Island, 100 m from Jahleel Island and the Port of Ngqura entrance.

The results of the dispersion modelling which informs the preferred location for discharging effluents, are summarised below.

Discharge west of the Port of Ngqura

The location of the discharge servitude west of the Port was identified as **'not viable'** for the construction of the proposed servitude for the following reasons:

- Effluent will need to be pumped around the perimeter of the Port which would result in significantly higher capital and operational costs compared with an eastern discharge.
- Although the required dilutions can be achieved, discharges west of the Port at -10 m will enter the Port, which increases the risk of accumulation of particulates with associated nutrients and heavy metals. If the pipeline is extended to -16 m, the achieved dilutions reduce the risk of effluent entering the Port. However, there is still a risk of accumulation of particulates with associated nutrients and heavy metals.

Discharge within the Port of Ngqura

Discharging of effluent within the Port was identified as **'not viable'** for the following reason:

- Discharges will potentially become trapped in the Port resulting in accumulation of particulates with associated nutrients and heavy metals.
- Disposal of effluent inside the Port may impact on Transnet's ability to meet the permit requirements as per their annual Dredge Disposal Permit. According to the 2019 Dredge Disposal Report, the high mud fraction of sediment in the Port reflects its depositional nature and indicates there is a high propensity for the retention and accumulation of particle reactive contaminants introduced in solution to the Port. In addition, the concentrations of some metals in the sediment at numerous stations did, exceed baseline model upper prediction limits. Copper was the most frequently enriched metal in sediment, followed by zinc and chromium. As such no further discharges can be allowed within the port considering the potential for the effluent to get trapped then and accumulate over time.

Discharge east of the Port of Ngqura

Discharge east of the Port was deemed as being **'potentially viable'** for the following reason:

- The required dilutions can be achieved with no risk of effluent entering the Port or unacceptable environmental damage to the Marine Protected Area (MPA). In addition, the National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) and the Regulations for the management of the Addo Elephant National Park Marine Protected Area (23 May 2019) Section 10(2) make allowance for discharges into the Addo MPA.

Impact risk assessment for alternative effluent discharge locations

A high-levelled risk assessment was conducted to assess the three (3) broad potential seawater discharge servitudes locations:

- West of the Port;
- Within the Port; and
- East of the Port.

The following list of environmental, social and economic impacts or risks were identified and considered with respect to determining the preferred effluent discharge servitude locations.

- Geographical location;
- Physical conditions (e.g. water quality);
- Terrestrial ecology;
- Marine ecology;
- Social;
- Socio-economic;
- Economic;
- Heritage & cultural;
- Technical;
- Climate change mitigation; and
- Climate change adaptation.

The risks were also considered with respect to the design, construction operation and decommissioning project phases.

Table 2.4 below provides the results of the high-level risk assessment in the form of a screening matrix of the three (3) broad potential effluent discharge servitudes locations. It takes into consideration the impact assessment and mitigation hierarchy, including:

- The nature of potential impacts including significance, consequence, extent, duration and probability; and
- Reversible, irreplaceable loss, can be avoided, managed or mitigated.

Table 2.4: High-levelled risk assessment screening matrix for effluent discharge servitude locations.

Environmental attributes	Effluent discharge servitude location alternatives		
	West of port	Within port	East of port
Geographical location	Not Preferred	Acceptable	Preferred
Physical conditions (e.g. water quality)	Acceptable	Not Preferred	Acceptable
Terrestrial ecology	Not Preferred	Acceptable	Acceptable
Marine ecology	Not Preferred	Not Preferred	Not Preferred
Social	Acceptable	Acceptable	Acceptable
Socio-economic	Acceptable	Acceptable	Acceptable
Economic	Not preferred	Acceptable	Preferred
Heritage & cultural	Acceptable	Acceptable	Acceptable
Technical	Acceptable	Acceptable	Acceptable
Climate change mitigation	Not preferred	Acceptable	Acceptable
Climate change adaptation	Acceptable	Acceptable	Acceptable

Economic and climate change impact assessments

While a detailed economic assessment and climate change impacts will be provided in the EIA phase, preliminary projections for the return of **only** the Once-Through cooling water a distance of about 12 km from Zone 10S and 10N east of the Port via the N2 to the west of the Port, via two 2.5 metre diameter Glass-fibre Reinforced Plastic (GRP) pipelines and associated pumps, are as follows:

Capital cost (12 km pf pipelines and pumps)	R 1 250 000 000
Annual operating cost (monitoring and maintenance)	R 130 000 000

Annual energy cost (pumping)	R 98 550 000
Operating cost 20year life (monitoring and maintenance)	R 2 600 000 000
Energy cost 20 year life (pumping)	R 1 971 000 000
TOTAL CAPITAL AND OPERATING COST OVER 20 YEAR LIFE	**R 5 821 000 000**
Annual carbon footprint (tCO_2e = tons of CO_2 equivalents)	94 608 tCO_2e
Carbon footprint 20 year life	1 892 160 tCO_2e
Annual cost of carbon @ R100 per ton	R 9 460 800
Cost of carbon @ R100 per ton over 20 year life	R 189 216 000

Table 2.5 below provides a summary of the conclusions made with respect to the preferred discharge servitude locations.

Table 2.5: Results of a high-level risk assessment completed for the three broad potential locations of the effluent discharge servitudes.

Abstraction location	Conclusion (Advantages / Disadvantages)	Reasonable and feasible
Discharge west of the Port	**Geographical location:** The discharge of effluent to the west of the Port is approximately 12 km from the point where the effluent will be generated in Zone 10 east of the Port. **Terrestrial ecology:** The reticulation of effluent streams around the Port from the east to the west along the N2 (a distance of about 12 km), poses higher risks to the terrestrial environment along the route, such as disturbance to vegetation and risk of effluent leakages along the route. **Social:** Large volumes of electricity would be required in order to pump effluent streams from Zone 10 to the west of the Port. Currently, the Country is experiencing energy crises and any avenues to save energy must be considered. **Economic**: The capital and operational costs associated with conveying large volumes of effluent a long distance around the Port to the west (a distance of about 12 km), from the power stations, and desalination and aquaculture facilities in Zone 10, would not be economically feasible. The total cost for only returning Once-Through cooling water is estimated to amount to be about R5.8 billion over the 20 year life of the project. **Water quality**: Although the required dilutions can be achieved, discharges west of the Port at -10 m will enter the Port, which increases the risk of accumulation of particulates with associated nutrients and heavy metals. If the pipeline is extended to -16 m, the achieved dilutions reduce the risk of effluent entering the Port. However, there is still a risk of accumulation of particulates with associated nutrients and heavy metals. **Climate change:** The carbon footprint associated with pumping effluent from Zone 10 to the west of the Port would be significant over the life of the project. The carbon footprint associated with pumping is projected to be in the region of about 1.9 million tCO2e	NO

Abstraction location	Conclusion (Advantages / Disadvantages)	Reasonable and feasible
	over the 20 year life of the project.	
Discharge within the Port	**Water quality and marine ecology:** There is a high risk of effluent becoming trapped within the Port resulting in accumulation of particulates with associated nutrients and heavy metals, consequently impacting on the marine ecology. In addition, any accumulation of particulates within the Port may result in the inability of the Port to meet discharge requirements related to its Dredge Disposal Permit.	NO
Discharge east of the Port	**Geographical location:** Discharge of effluent to the east of the Port is geographically closer to the location where the effluent will be generated in Zone 10. **Economic**: The capital and operational costs associated with conveying large volumes of effluent from Zone 10 to the east of the Port, would be much lower over the life of the project, compared with pumping effluent streams around the Port to the west (a distance of about 12 km). **Water quality and marine ecology:** Effluent discharges east of the Port would be into the proclaimed Addo Elephant Marine Protected Area. However, the results of the dispersion modelling (PRDW, 2020) show that the required dilutions can be achieved for the worst-case effluent scenario. In addition, the Addo Elephant MPA Regulations make allowance for the discharge of effluent streams into the MPA. **Climate change:** The carbon footprint associated with discharging effluent from Zone 10 into the location east of the Port, would be much lower over the life of the project, compared with pumping effluent around the Port to the west.	YES

Conclusion
The **preferred alternative location** is for the effluent discharge servitudes to be located to the **east of the Port.**

SPECIFIC LOCATIONS, LENGTH AND WIDTH OF THE SERVITUDES

PRDW dispersion modelling 2020

In 2017 PRDW undertook marine effluent dispersion modelling for 12 potential discharge scenarios, to inform the movement of the discharge plumes and possible interactions with planned seawater abstraction points (PRDW, 2017). In 2020, PRDW extended their investigation to model additional scenarios based on the updated effluent characterisation and to refine optimal intake and outlet locations.

It is important to note that at this point, abstraction and effluent dispersion modelling was limited to east of the breakwater, due to discharging to the west of the Port and inside the Port having been excluded as viable options.

It should also be noted that 11 of the 12 discharge scenarios tested by PRDW in 2017 comprised only one discharge location and one effluent, with only one scenario having combined effluents, since the focus of this initial dispersion modelling exercise was to compare different broad discharge locations. The 2020 study comprised **worst-case effluent scenarios** and multiple discharge locations with all the effluents being discharged simultaneously in order to test the combined impact.

The following six (6) **worst-case** effluent streams were considered in the 2020 PRDW dispersion modelling study:

Purpose	Type of effluent	Worse case discharge flow rates
Cooling water: once-through cooling	Seawater at 28°C and salinity of 35 ppt	14.70 m^3/sec
Cooling water: wet mechanical draft cooling	Seawater at 23°C and salinity of 53 ppt	0.30 m^3/sec
Aquaculture flow through system for abalone	Seawater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD.	5.00 m^3/sec
Aquaculture recirculation system for finfish	Seawater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD.	0.94 m^3/sec
Desalination brine	Brine at 60 ppt	1.22 m^3/sec
Wastewater	Treated domestic and industrial wastewater with projected concentrations of ammonia, nitrate, nitrite, TSS, COD, salinity heavy metals and E.coli	0.93 + 0.46 m^3/sec
TOTAL		**23.55 m^3/sec**

The characteristics of each individual effluent were provided by the CDC based on the respective industry specialist input. In addition, the modelling of the worst-case discharge scenario required assigning an intake and discharge location for each of the six effluent streams. The intake and discharge locations were chosen to align with the relevant infrastructure within the SEZ as provided by the CDC.

The worst-case discharge scenario was run for the summer and winter months. The model outputs show the achieved dilutions in each horizontal and vertical element of the computational mesh at 1-hour intervals throughout the simulation period. Figure 2.18 below provides an example of the dilution contours for worse-case finfish aquaculture effluent.

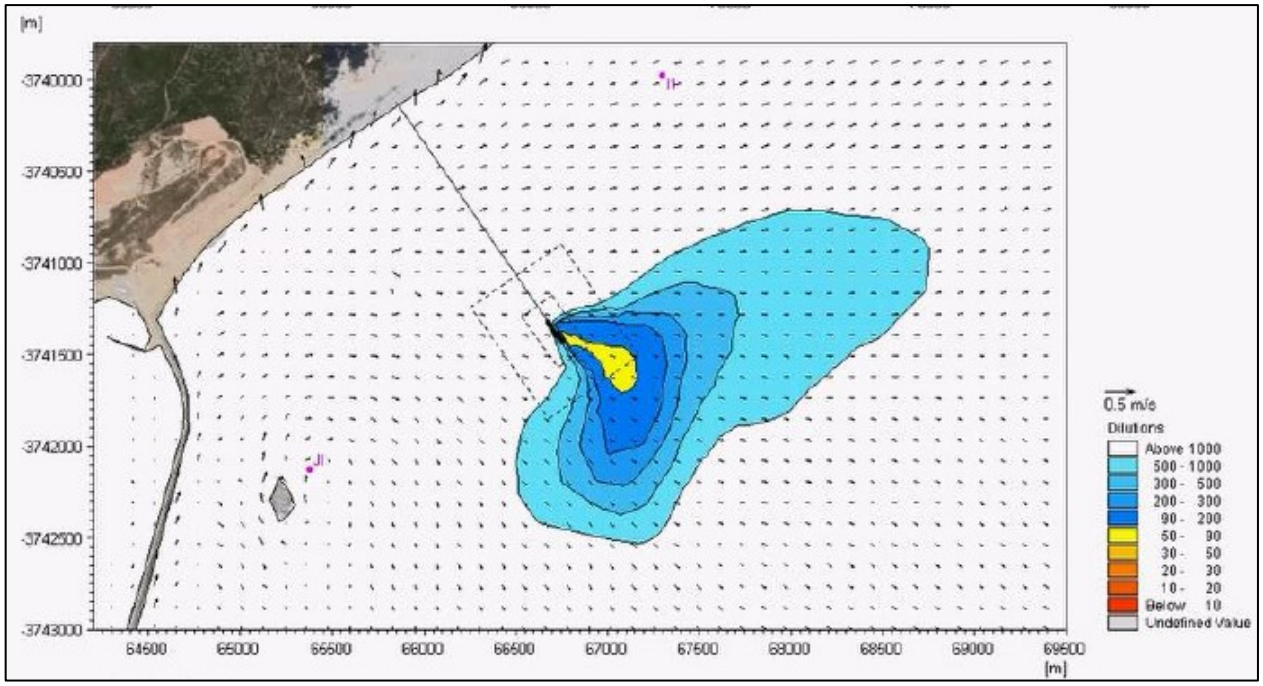


Figure 2.18: Example of dilution contours for finfish aquaculture effluent discharges.

The following conclusions were drawn from the 2020 marine dispersion modelling study:

- All the discharges considered can meet the applicable water quality guidelines (WQGs) (The marine WQGs currently in force are those defined in DWAFF (1995). These have been reviewed and updated in DEA (2019) but these are still in draft form and are not yet gazetted. Therefore, here the DWAFF (1995) version of the guidelines are followed primarily but are augmented by WQGs from other jurisdictions where required, e.g. ANZECC (2000), IFC (2009), along with peer-reviewed toxicity test data) within the 300 m mixing zone, except for wastewater and the combined brine and finfish discharge.
- With respect to wastewater, the maximum allowable effluent concentrations (end of pipe) for E.coli, TKN + NH_4 and TSS must be limited in order to meet the Guidelines.
- To ensure compliance, the brine and finfish effluent should be discharged separately.
- Both the cooling water discharges tested meet the guidelines.
- Should additional constituents be added to the effluent streams or identified in future, then the end-of-pipe concentrations of these constituents will need to be limited based on the achieved dilutions from the dispersion model as provided in the modelling report (PRDW, 2020) and the applicable guidelines, using the precautionary principle in cases where marine water quality guidelines for these constituents are not clear.

Figure 2.19 below shows in RED the three discharge locations identified by PRDW (2020).

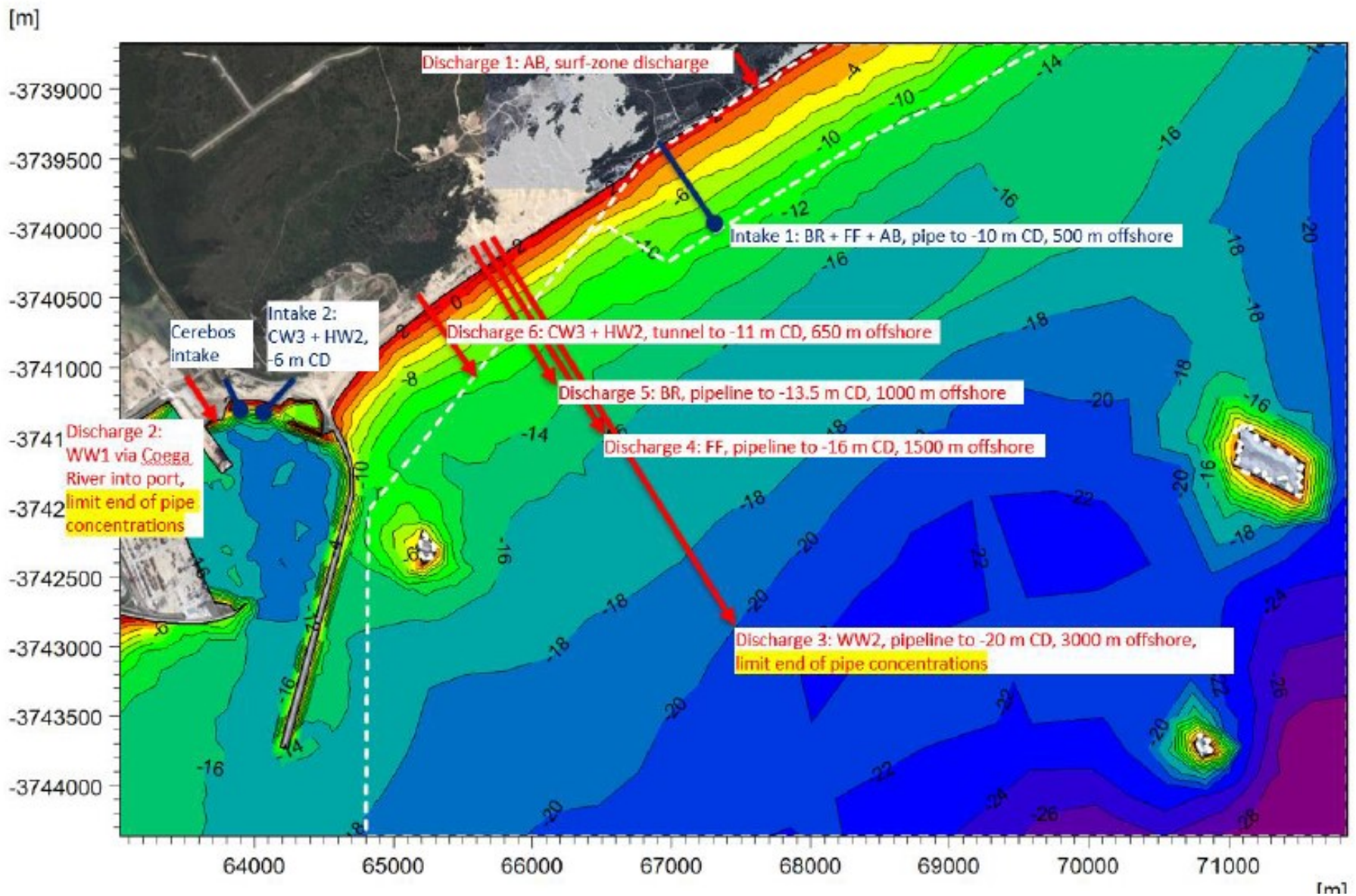


Figure 2.19: Recommended effluent discharge (RED) and intake (BLUE) marine servitude locations (PRDW, 2020).

Conclusion

The **preferred specific alternative locations** for the discharge of the various effluent streams is three separate servitudes comprising:

- Discharge servitude 1:
  - Cooling water effluent discharge servitude 200 m wide to a distance of 650 m offshore and a depth of -11 m CD.
- Discharge servitude 2: Combined effluent discharge servitude 200 m wide with the following:
  - Brine discharge 1,000 m offshore, at a depth of -13.5 m CD.
  - Finfish aquaculture recirculation system effluent discharge 1,500 m offshore, at a depth of -16 m CD.
  - Wastewater discharge from Phase 2 of the WWTW at 3,000 m offshore, at a depth of -20 m CD.
  - Stormwater discharge onto the beach.
- Discharge servitude 3:
  - Abalone aquaculture flow-through system effluent discharge servitude 100 m wide into the surf zone.
  - Stormwater discharge onto the beach.

ALTERNATIVE DESIGN AND TECHNOLOGY TO BE USED IN THE ACTIVITY

The WSP 2020 technical report investigated two types of infrastructure for the discharge of the Once-Through and Wet Mechanical Cooling water. These included:

- Eight (8) metre wide raceway; and
- Three (3) metre diameter tunnel.

Raceway discharge

The possibility of attaching a raceway to the eastern breakwater of the Port was determined not to be feasible due to risks associated with the structural integrity of the breakwater. An alternative freestanding raceway was also investigated. However, the freestanding raceway option would require significant infrastructure including two lateral breakwaters that would have a large ecological footprint and affect sediment movement. Hence, this option was deemed as being both financially and ecologically unacceptable.

Tunnel discharge

WSP have recommended that a tunnel is the most feasible option for discharging the large volumes of water from a once-through cooling system. A 3,000 mm (3.0 m) outer diameter tunnel will be required for this purpose. The length from the upper beach to offshore would be about 600 m. Beyond this, seabed mounted pipelines may be used for the diffuser section.

The tunnel would consist of a concrete conduit (concrete pipe section installed by means of jacking and a tunnel boring machine from land). The concrete mix design should enable the requisite design life to be realised with the warm seawater flowing inside the tunnel.

The tunnel boring and pipe jacking is a large-scale operation. Pipe jacking would be installed from the land side to the -11 m relief well (offshore retrieval pit) to extract the drilling equipment. It is likely that a marine jack-up barge may be required for this purpose.

The construction of a tunnel is thus the preferred alternative technology for the discharge of large volumes (14 m^3/sec) of effluent cooling water.

Additional technologies required for servitudes

The construction of pipelines will be required for the discharge of brine, aquaculture effluent (finfish and abalone) and treated wastewater from the Coega WWTW. Directional drilling under the surf zone may be feasible for some of the discharge requirements, as opposed to laying a pipeline on the seabed through the surf zone. Other than that, no other technical alternatives will be considered as a pipeline is considered to have the smallest construction footprint.

Conclusion

The **preferred alternative design and technology** for the three separate discharge servitudes includes:

- Discharge servitude 1:
  - Tunnel (to accommodate large flows from Once-Through and Wet Mechanical Cooling).
- Discharge servitude 2: Separate pipelines for the following:
  - Brine discharge;
  - Finfish aquaculture recirculation system effluent discharge;
  - Treated wastewater for Phase 2 of the WWTW; and
  - Stormwater gabion system.
- Discharge servitude 3:
  - Pipeline for abalone aquaculture flow-through system effluent discharge into the surf zone; and
  - Stormwater gabion system.

PREFERRED EFFLUENT DISCHARGE SERVITUDE ALTERNATIVE

The following table provides a summary of the **preferred alternative effluent discharge servitudes** (made up of three servitudes) that will be assessed in the EIA. No other alternatives will be assessed except for the no-go alternative, since there are no other reasonable and feasible alternatives.

Alternative category	**Preferred alternative**		
Servitude	**Discharge servitude 1**	**Discharge servitude 2**	**Discharge servitude 3**
Activity	Discharge of Once-Through and Wet Mechanical cooling water effluent totalling 15.0 m^3/sec, back into the sea.	Discharge of finfish aquaculture recirculation system effluent (0.94 m^3/sec), brine (1.22 m^3/sec), treated wastewater (1.4 m^3/sec) in three separate pipelines, and stormwater, into the sea.	Discharge of abalone aquaculture flow-through effluent (5.0 m^3/sec) and stormwater, into the sea.
Geographical location	East of the Port of Ngqura, as indicated in PRDW map (Figure 2.18).	East of the Port of Ngqura, as indicated in PRDW map (Figure 2.18).	East of the Port of Ngqura, as indicated in PRDW map (Figure 2.18).
Specific location	Servitude of 200 m width to -11 m CD, 650 m offshore	Servitude of 200 m width with: • Brine discharge to -13.5 m CD, 1,000 m offshore. • Finfish aquaculture discharge to -16 m CD, 1,500 m offshore. • Wastewater from phase 2 of the WWTW to -20 m CD, 3,000 m offshore.	Servitude of 200 m width along the shoreline.
Design and layout	Tunnel with diameter of up to 3,000 mm.	Pipelines including: • Brine – 700 mm diameter HDPE pipe; • Finfish – 700 mm diameter HDPE pipe;	Beach pipeline – 1,600 mm diameter HDPE pipe. Stormwater gabion system.

Alternative category	Preferred alternative		
		• Wastewater – up to 700 mm diameter HDPE pipe. Stormwater gabion system.	

Figure 2.20 below shows the broad preferred locations of the three marine discharge servitudes.

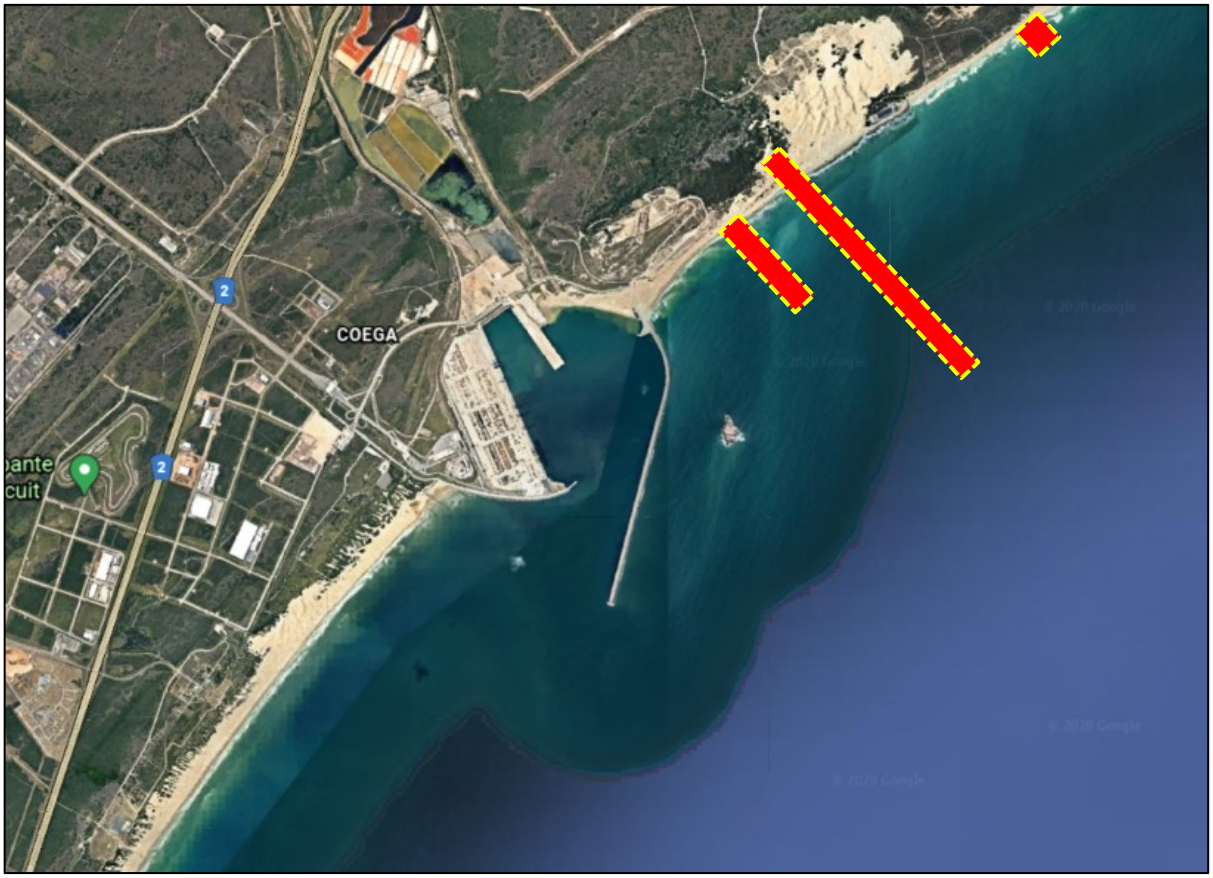


Figure 2.20: Broad preferred locations of the three proposed effluent discharge (RED) marine servitudes.

2.5.5 Analysis of Land-Based Infrastructure Alternatives

Alternative type of activity to be undertaken

Land-based infrastructure is required to connect various servitude(s) to the respective industries, as such, no activity alternatives are deemed to be reasonable / feasible.

Alternative locations for the proposed activity

A desktop screening exercise of available information on land-based sensitive terrestrial and aquatic environments was carried out to identify suitable alignments for the land-based connections to the proposed servitudes. These alignments were then refined based on the outcome of the marine dispersion modelling undertaken in June 2020. A detailed site-specific terrestrial ecological survey of the area will be undertaken as part of the specialist phase of the project. The following areas have been avoided, as far as practically possible, when placing land-based infrastructure:

- Areas below the coastal management line and/or within 100 m of the high water mark of the sea (unless the nature of the required structure necessitates it to be positioned in this area, in which case appropriate design mitigation must be used to prevent damage to structures or infrastructure as a result of storm surges, unusual high tides, coastal erosion, climate change etc.).
- Mobile dune process areas and/or areas sensitive to coastal erosion.
- Areas that occur within CBAs designated in the Coega Open Space Management Plan (OSMP).
- Known and anticipated habitats used by *Damara terns* (this would correspond with dune field areas and dune slacks).
- Areas that occur within the 1:100-year floodline of the Coega River or 100 m of the Coega River/Estuary (whichever is greater) and 50 m from wetlands.
- Areas where sensitive archaeological and paleontological sites have been recorded.
- Areas that would conflict with existing facilities or infrastructure (e.g. Port facilities) and / or rights (e.g. mining rights in the coastal dune fields) and planned expansions/infrastructure reflected on approved development plans (e.g. the Coega development framework plan, Masterplan for east of the Coega River and OSMP that shows the position of stormwater infrastructure).
- As part of the approved rezoning EIA for the Coega SEZ, a services corridor has been designated. The alignment and positioning of required land-based infrastructure should coincide with this corridor as far as practically possible. Further, required infrastructure should be limited to disturbed areas such as within road servitudes and adjacent to the boundary of approved sites.

The proposed land-based servitudes will be 30 m wide.

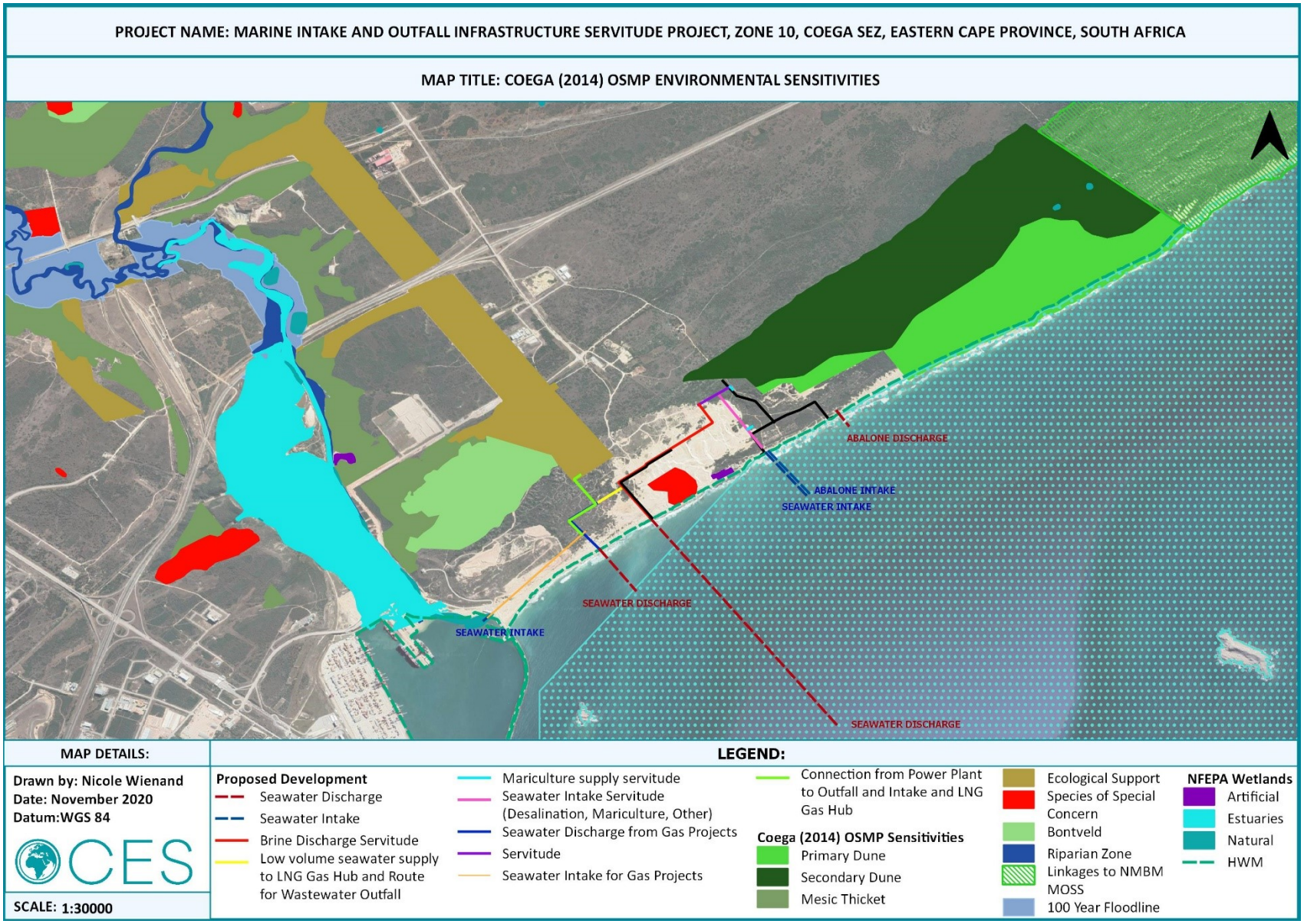


Figure 2.21: Preferred layout, superimposing all terrestrial and marine based sensitive features.

Alternative design and technology of the activity

The land-based seawater intake and effluent discharge pipeline reticulation will comprise HDPE pipes with diameters ranging between 600 mm to 3000 mm. Various pump stations and booster stations will be constructed along the route of the pipeline reticulation.

Alignments and preferred positions will be finalised at EIA stage with input from design engineers to advise on aspects such as topography, pumping requirements, costs, flow rates etc.

Preferred alternative

Alternative category	Land-based servitudes
Activity	Land-based infrastructure is required to connect various servitude(s) to the respective industries.
Geographical location	Coastal area of Zone 10
Specific Location	30 m Servitude (Figure 2.21 above).
Design and layout	HDPE pipes with diameters ranging between 600 mm to 3000 mm

2.5 NO DEVELOPMENT ALTERNATIVE

Various industrial activities occur in and are planned for the Coega SEZ. A number of industries will require seawater for their operations (e.g. aquaculture, cooling water for power plants, desalination plants) and/or will have to discharge treated effluent to an environment other than a WWTW. The latter relates mostly to industries that will use seawater in their processes. However, effluent from industries that are discharged to a WWTW (whether on-site or to a central WWTW such as the planned Coega WWTW) will still ultimately end up in the marine environment – this could either be directly discharged to the marine environment or indirectly. If for example, effluent is discharged into the Coega River it will consequently end up in the marine environment.

The use of seawater for industrial activities will reduce reliance on municipal services and infrastructure that would be needed to supply large volumes of potable water. This is of utmost importance as the NMBM is a water stressed area. In September 2020, the NMBM declared Day Zero and a number of areas within the NMBM were left without water and needed to be provided with this basic service via water tankers. This situation is exacerbated by poor maintenance of water infrastructure within the NMBM. It is therefore not only important to reduce the freshwater requirements of industry through the utilisation of seawater, but also to find an alternative means of water provision, such as the desalination of seawater, in addition to improved demand-side of management by the NMBM (e.g. leak detection and repair). This is especially important amidst the crisis brought about by the COVID-19 Pandemic that the country is currently facing, with proper sanitation and hygiene being paramount at preventing the spreading of this Pandemic. The utilisation of desalinated water within the Coega SEZ would further relieve some of the stress on the NMBM to provide the required amount of freshwater for industry within the SEZ.

Considering the vastness of the Coega SEZ and the array of planned industries, the need for servitudes to accommodate seawater abstraction and discharge infrastructure has been identified. In the absence of this, individual industries would need to plan and apply for separate abstraction and discharge infrastructure along the coastline, which would likely present far greater environmental impact on the receiving marine environment as a result of haphazard and multiple discharge points resulting in numerous cumulative impacts. Individual discharges would also make it difficult to control and monitor discharge quality, and to manage associated risks in the event of upset conditions.

An integrated and common-user servitude would also result in cost-savings for both the CDC and investors, and would present a more efficient way of planning and providing the required infrastructure for industries to develop and operate in the SEZ. In summary, the following potential benefits are anticipated from having common-user abstraction and discharge servitudes versus individual abstraction and discharge points along the coast:

- The development of an integrated marine servitude avoids the need for several pipelines/infrastructure crossing the beach into the sea, thereby limiting the visual, economic, planning and environmental impacts associated with these.
- The discharge of treated wastewater to the marine environment potentially presents less of a risk when properly managed than discharging to fresh water environments, primarily because of the greater assimilative capacity of the marine environment. The effluent dispersion modelling has confirmed that the target dilutions can be achieved. Impacts on the marine ecology will be investigated and reported on in the EIA.

In addition, having the appropriate infrastructure available to investors will enhance the attractiveness of the Coega SEZ as an investment destination and, therefore, future investment trends. This will result in increased revenue, foreign exchange, increased taxes and royalties. An increase in investment into the area will also lead to more employment, local economic development, skills development, and local procurement. The EIA for the aquaculture zone was approved in February 2018. However, if the SEZ is not able to meet the water requirements for this industry, no further development of this zone would be possible.

There are however risks associated with the planned servitude(s) during both construction and operational phases, and careful consideration has to be given to the management of these in the operational phase especially as various industries will become operational at different stages. The purpose of this EIA process is to assess impacts of establishing the servitude(s) in comparison with the no-go option, and to provide mitigation measures for industries (current and future) to incorporate in their design and operations to avoid and/or reduce impacts on the receiving marine environment.

The ‘no-go’ option will be used as a baseline throughout the assessment process against which potential impacts will be compared in an objective manner.

3. LEGAL AND POLICY FRAMEWORK

3.1 INTRODUCTION

Item 2 (e) of Appendix 2 of the National Environmental Management Act (NEMA, Act No. 107 of 1998, as amended) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent amendments), states that 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” must be included in the Scoping Report.

Thus, in line with the above legislative requirement the sections below describe the South African legislation that was taken into consideration during the Scoping Phase of the proposed project.

3.2 ENVIRONMENTAL AUTHORISATION LEGISLATIVE PROCESS

3.2.1 NEMA Environmental Authorisation

The National Environmental Management Act (NEMA, Act No. 107 of 1998 and subsequent amendments)

The objective of the NEMA is: "To provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state; and to provide for matters connected therewith."

A key aspect of the NEMA is that it provides a set of environmental management principles which apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. The proposed development has been assessed in terms of possible conflicts or compliance with these principles. Section 2 of the NEMA contains principles (see Table 3.1) relevant to the proposed project, and which are likely to be utilised in the process of decision making by the competent authority.

Table 3.1: NEMA Environmental Management Principles.

(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.
(3)	Development must be socially, environmentally and economically sustainable.
(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; ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; and iii. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used and/or recycled where possible and otherwise disposed of in a responsible manner.
(4)(e)	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
(4)(i)	The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions should be based on the consideration and the findings of the assessment.
(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.
(4)(p)	The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment ("the polluter pays").
(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.

As these principles are utilised as a guideline by the competent authority in ensuring the protection of the environment, the proposed development should, where possible, be in accordance with them. Where this is not possible, deviation from the principles would have to be very strongly motivated.

The NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution, and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons.

In addition, the NEMA introduced a new framework for Environmental Impact Assessments (EIAs), the NEMA EIA Regulations (2014 and subsequent 2017 amendments).

Relevance to the proposed project:

Three (3) lists of activities, published on the 21st of April 2006 and amended on 4th of December 2014 (and subsequent 2017 amendments), as Government Notice Numbers R.983, R.984, and R.985 define the activities which require, either a Basic Assessment (applies to activities with limited environmental impacts: GNR. 983 and GNR. 985), or a Scoping and Environmental Impact Assessment (applies to activities which are significant in extent and duration: GNR. 984). Listing Notice 3 (contained in GNR. 985) lists activities which would require authorisation if carried out in specified or sensitive geographical areas. It should be noted that even if only one (1) listed activity is triggered in Listing Notice 2 (GNR. 984), the activity will trigger a full Scoping and EIA, regardless of if more than one (1) activity is triggered in Listing Notice 1 (GNR. 983). All listed activities that are triggered in the above listing notices need to be assessed in the assessment report.

The activities triggered by the proposed development are listed in Table 3.2 below.

Table 3.2: Listed activities triggered by the proposed development.

Number relevant notice	Activity No(s)	Description of each listed activity based on the project description	Comments and observations
Listing Notice 1 of GNR. 983 EIA Regulations dated 4 December 2014	10	The development and related operation of infrastructure exceeding 1,000 metres in length for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharges or slimes: (ii) With a peak throughput of 120 litres per second or more.	The proposed development includes the construction of three effluent discharge pipelines into the sea at a distance exceeding 1,000 metres offshore in pipelines with a diameter of about 3.0 metres, for the following discharges: • Brine discharge to a distance of 1,000 m offshore at a throughput of 1.22 m^3 per second. • Finfish aquaculture effluent discharge to a distance of 1,500 m offshore at a throughput of 0.94 m^3 per second. • Wastewater from phase two wastewater treatment works (WWTW's) to a distance of 3,000 m offshore at a throughput of 1.39 m^3 per second. No exclusions apply.
	15	The development of structures in the coastal public property where the development footprint is bigger than 50 square metres.	The proposed development entails the construction of infrastructure (e.g. effluent discharge tunnels and pipelines) with a physical footprint of 414 391 square meters (41.1 Ha) within coastal public property as defined in terms of Section 7(1) of the NEM:ICMA. No exclusions apply.

	17	Development: (i) In the sea; (iii) Within the littoral active zone; (v) 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; In respect of: (a) Fixed or floating jetties and slipways (d) Rock revetments or stabilising structures including stabilising walls; (e) Infrastructure or structures with a development footprint of 50 square metres or more.	The proposed development includes the construction of seawater intake and effluent discharge infrastructure (e.g. effluent discharge tunnel and pipelines, intake basin, pipeline and jetty, headworks, pump station, vertical beach wells, distribution chamber) in the sea, within the littoral active zone and within a distance of 100 metres inland of the high-water mark from the sea. The total footprint of infrastructure will be approximately 470,000 square meters (47 Ha). It is larger than the area presented in Listed Activity 16 above as it also includes areas located 100 meters inland of the high-water mark. No exclusions apply.
	18	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.	The proposed development will include the stabilization of disturbed areas of more than 10 square metres, within the littoral active zone after construction has been completed. No exclusions apply.
	19 A	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) The seashore; (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 is the greater; or (iii) The sea.	The development will require the excavation and infilling of material exceeding 5 cubic metres in the coastal environment for the construction of infrastructure (e.g. effluent discharge tunnel and pipelines, intake basin, pipelines and jetty, headworks, pump station, vertical beach wells, distribution chamber) that will occur within 100 metres inland of the high-water mark, within the seashore and in the sea. No exclusions apply.

Listing Notice 2 of GNR.984 EIA Regulations dated 4 December 2014	6	The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent.	The proposed development includes the construction of effluent discharge infrastructure (e.g. effluent discharge tunnel and pipelines) to discharge various effluent streams (cooling water, brine, aquaculture effluent and wastewater) totalling 23.55 m^3/sec into the marine environment, which will require a Coastal Waters Discharge Permit in terms of Section 69 of the NEM:ICMA. No exclusions apply.
	14	The development and related operation of — (i) An anchored platform; or (ii) Any other structure or infrastructure on, below or along the seabed.	The proposed development includes the construction of a tunnel, pipelines and jetty for abstracting seawater from and discharging effluent into the sea, and wave pressure pumps, where the infrastructure will be located on, below and along the seabed. No exclusions apply.
	26	Development — (i) In the sea; (iii) Within the littoral active zone; (v) 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; In respect of— (g) Tunnels	The development will include the construction of a tunnel for the discharge of cooling water into the sea where the tunnel will be located in the sea, within the littoral zone and within a distance of 100 metres inland of the high-water mark. No exclusions apply.
Listing Notice 3 of GNR.985 EIA Regulations dated 4 December 2014	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) Eastern Cape (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	The development will include the construction of land-based infrastructure (e.g. pipelines and pump stations) that will require the clearance of a maximum of 220,000 square meters (22 Ha) of indigenous vegetation. This area includes all indigenous vegetation within the land-based servitudes. The area to be cleared is within a CBA in terms of the Metro's current Bioregional Plan, within the littoral active zone and open space No exclusions apply.

		(v) 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 NEMA EIA listed activities which have been identified by CES, namely the Listing Notice 2 listed activities in GNR. 984, the proposed project's application for EA will be subject to the Scoping and EIA Process as stipulated in the regulations. As set out by Section 24C of the NEMA, the relevant competent authority for this activity is the DEFF.

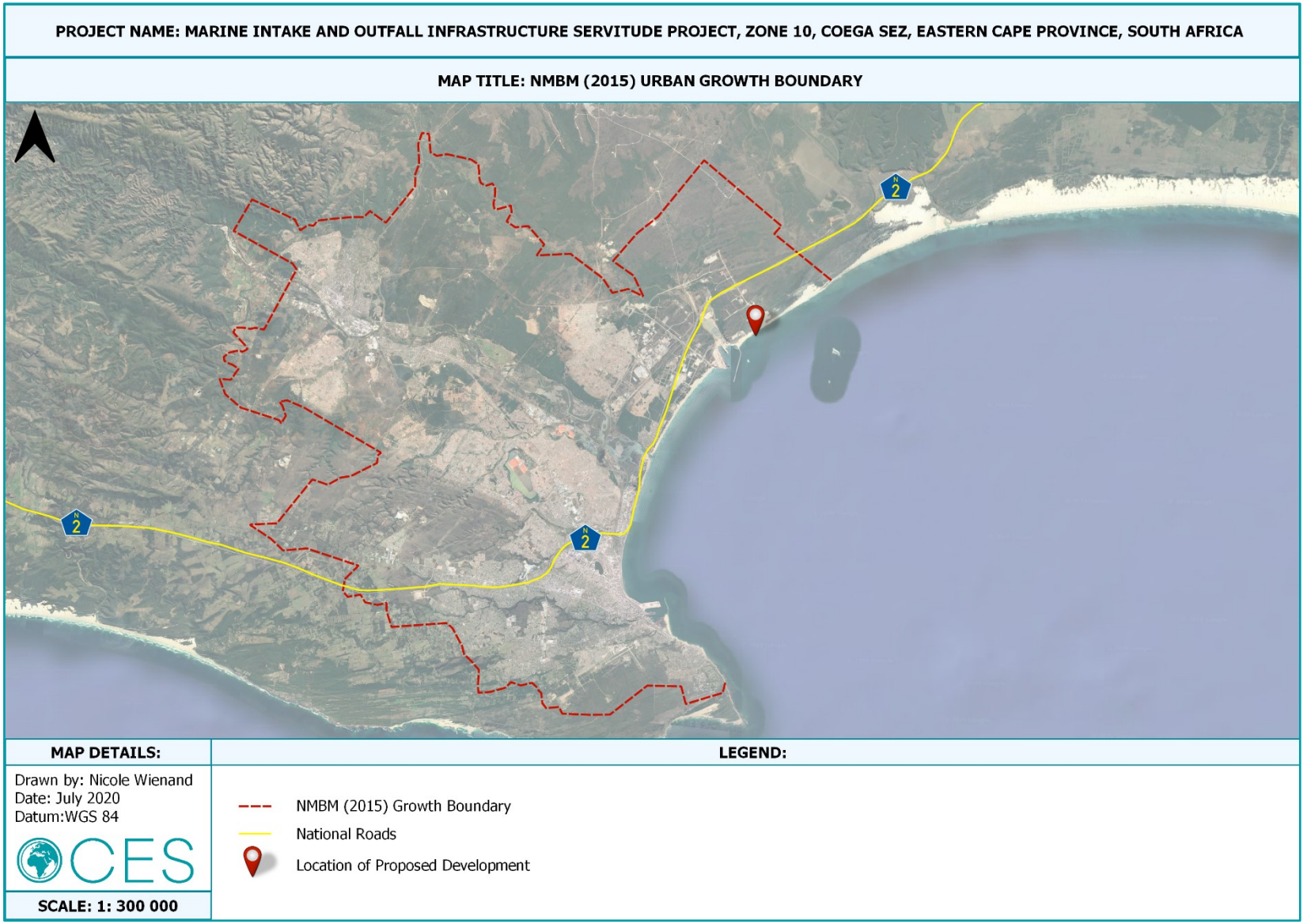


Figure 3.1: The location of the proposed site in relation to the urban edge as outlined in the NMBM SDF (2015).

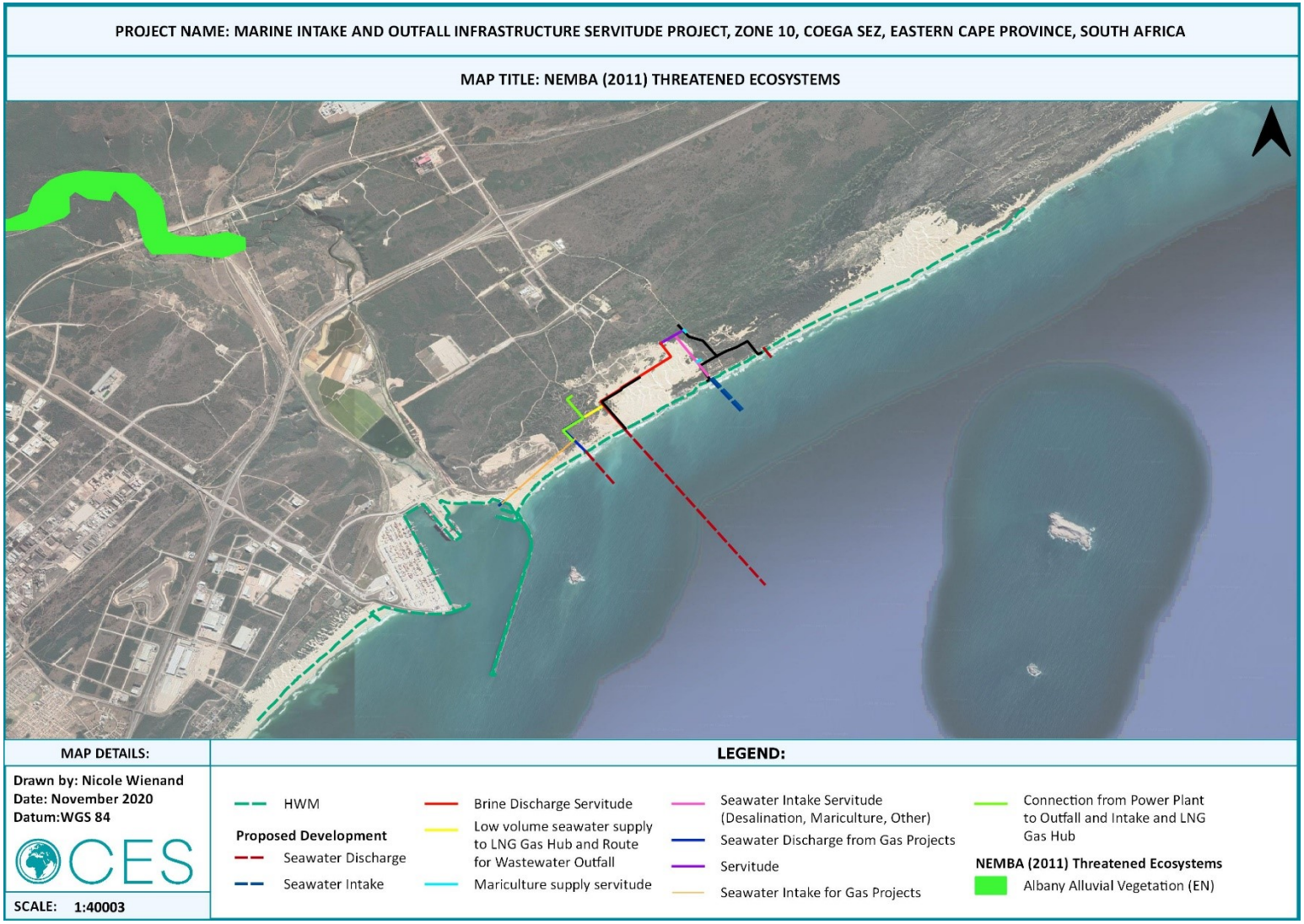


Figure 3.2: Threatened Ecosystems as defined by NEM:BA.

3.2.2 Consolidated Permitting Requirements

National Environmental Management: Integrated Coastal Management Act (24 of 2008)

According to Section 2 of the NEM: ICMA, the objects of this Act are:

- *To determine the coastal zone of the Republic;*
- *To provide, within the framework of the National Environmental Management Act, for the co-ordinated and integrated management of the coastal zone by all spheres of government in accordance with the principles of co-operative governance;*
- *To preserve, protect, extend and enhance the status of coastal public property as being held in trust by the State on behalf of all South Africans, including future generations;*
- *To secure equitable access to the opportunities and benefits of coastal public property; and*
- *To give effect to the Republic's obligations in terms of international law regarding coastal management and the marine environment.*

Section 69(1) of the Act states that no person may discharge effluent that originates from a source on land into coastal waters except in terms of a general discharge permit or a coastal waters discharge permit issued under this section by the Minister after consultation with the Minister responsible for water affairs in instances of discharge of effluent into an estuary.

The abstraction of seawater is not mentioned in the act and therefore this activity does not require any permits from Oceans and Coasts (OC), a branch within the Department of Environmental Affairs with jurisdiction over ocean and coastal management in South Africa.

Relevance to the proposed project:

- A coastal discharge permit will be considered from the Minister for the discharge of effluent into the marine environment.

National Water Act (36 of 1998)

The Act regulates the protection, use, development, conservation, management and control of water resources in South Africa. The principal concerns in terms of the Act are the potential for the proposed development to pollute surface and groundwater resources, and to ensure that water is used as efficiently as possible.

Chapter 4 Part 1 of the NWA sets out general principles for regulating water use. "*Water use is defined broadly, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. In general, a water use must be licensed unless it is listed in Schedule 1, as an existing lawful use, is permissible under a general authorisation, or if a responsible authority waves the need for a licence. The Minister may limit the amount of water which a responsible authority may allocate. In making regulations the Minister may differentiate between different water resources, classes of water resources and geographical areas*."

Relevance to the proposed project:

19 (1) An owner of land, a person in control of land or a person who occupies or uses the land on which—

(a) Any activity or process is or was performed or undertaken; or

(b) Any other situation exists, which causes, has caused or is likely to cause pollution of a water resource,

must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.

A water use authorisation may be required from the Department of Water and Sanitation (DWS) in accordance with the National Water Act (NWA, Act No. 36 of 1998 and subsequent amendments) if any infrastructure occurs within 100 m of a watercourse and/or occurs within 500 m of a wetland.

3.3 OTHER APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

3.3.1 National Legislation

The Constitution

The Constitution of the Republic of South Africa is the supreme law of the land. As a result, all laws, including those pertaining to the proposed development, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, 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.

Relevance to the proposed project:

- Obligation to ensure that the proposed development will not result in pollution and ecological degradation; and
- Obligation to ensure that the proposed development is ecologically sustainable, while demonstrating economic and social development.

The National Environmental Management: Air Quality Act (39 of 2004)

As with the Atmospheric Pollution Prevention Act 45 of 1965, the objective of the Air Quality Act is to protect the environment by providing the necessary legislation for the prevention of air pollution. "*To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.*"

Relevance to the proposed project:

- The "best practicable means" for the abatement of dust during construction and operation if approved have to be taken.
- All appliances used for preventing or reducing to a minimum the escape into the atmosphere of noxious or offensive gases have to be properly operated and maintained and the best practice means for achieving this implemented.
- The proposed development does not trigger any of the listed activities under this Act and as such no Air Emissions Licence according to the NEM: Air Quality Act (Act 39 of 2004) is required.

National Environmental Management: Waste Act (59 of 2008)

This legislation aims to enforce an integrated approach to waste management, with emphasis on prevention and reduction of waste at source and, where this is not possible, to encourage reuse and recycling in preference to disposal.

Section 16 (Chapter 4) of this Act deals with the general duty in respect to waste management and emphasises that, "*A holder of waste must, within the holder's power, take all reasonable measures to:- avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated; reduce, re-use, recycle and recover waste; where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner; manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts; prevent any employee or any person under his or her supervision from contravening this Act; and prevent the waste from being used for an unauthorised purpose*".

Chapter 4, Part 3 of this Act deals with reduction re-use and recovery of waste, Part 4 deals with waste management activities, Part 5 covers storage collection and transportation of waste, Part 6 deals with treatment, processing and disposal of wastes, Part 7 covers industry waste management plans and Part 8 deals with contaminated land. Chapter 5 covers all issues regarding the licensing of waste management activities.

Relevance to the proposed project:

- All reasonable measures must be taken to avoid the generation of waste and where such generation cannot be avoided, minimise the toxicity and amounts of waste that are generated; reduce, re-use, recycle and recover waste; where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- Manage the waste in such a manner that it does not endanger human health or the environment or cause a nuisance through noise, odour or visual impacts.
- Prevent any employee or any person from contravening this Act; and prevent the waste from being used for an unauthorised purpose.
- The proposed development does not trigger any listed activities under this Act and as such does not require a Waste Licence according to the NEM: Waste Act (Act 59 of 2008).

The National Environmental Management: Biodiversity Act (10 of 2004)

This Act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act 107 of 1998 (see Table 3.3 below). In terms of the Biodiversity Act, the developer has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA Regulations).
- Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.
- Limit further loss of biodiversity and conserve endangered ecosystems.

Table 3.3: Management and conservation of South Africa's biodiversity within the framework of NEMA.

CHAPTER 4	
	Provides for the protection of species that are threatened or in need of national protection to ensure their survival in the wild; o To give effect to the Republic's obligations under international agreements regulating international trade in specimens of endangered species; and o Ensure that the commercial utilization of biodiversity is managed in an ecologically sustainable way.
CHAPTER 5 (Part 2)	
Section 73	A person who is the owner of land on which a listed invasive species occurs must: a) Notify any relevant competent authority, in writing, of the listed invasive species occurring on that land; b) Take steps to control and eradicate the listed invasive species and to prevent it from spreading; and c) Take all required steps to prevent or minimise harm to biodiversity.
Section 75	• Control and eradication of a listed invasive species must be carried out by means or methods that are appropriate for the species concerned and the environment in which it occurs. • Any action taken to control and eradicate a listed invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment. • The methods employed to control and eradicate a listed invasive species must also be directed at the offspring, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.

The objectives of this Act are to provide, within the framework of the National Environmental Management Act, for:

- The management and conservation of biological diversity within the Republic;
- The use of indigenous biological resources in a sustainable manner.

The Act's permit system is further regulated in the Act's Threatened or Protected Species Regulations, which were promulgated in February 2007.

Relevance to the proposed project:

- The proposed development must conserve endangered ecosystems and protect and promote biodiversity;
- Must assess the impacts of the proposed development on endangered ecosystems;
- No protected species may be removed or damaged without a permit. The CDC has a NECO permit, issued by DEDEAT, for the removal of indigenous vegetation within all developable areas. The CDC also recently renewed their TOPS permit which requires to be updated annually;
- The proposed site must be cleared of alien vegetation using appropriate means.

The National Forest Act (84 of 1998)

The objective of this Act is to monitor and manage the sustainable use of forests. In terms of Section 12 (1) (d) of this Act and GN No. 1012 (promulgated under the National Forest Act), no person may, except under licence:

- Cut, disturb, damage or destroy a protected tree; or
- Possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree.

Relevance to the proposed project:

- If any protected trees in terms of the National Forest Act occur on site, the developer will require a licence from the DAFF to perform any of the above-listed activities. It should be noted that the CDC has a permit from DAFF for the removal of protected trees in all developable land within the SEZ. This permit is renewed annually.

National Environmental Management: Protected Areas Act (31 of 2004)

The purpose of this Act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes.

The objectives of this Act are-

- To provide, within the framework of national legislation, including the National Environmental Management Act, for the declaration and management of protected areas;
- To provide for co-operative governance in the declaration and management of protected areas;
- To effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity;
- To provide for a representative network of protected areas on state land, private land and communal land;
- To promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas;
- To promote participation of local communities in the management of protected areas, where appropriate; and
- To provide for the continued existence of South African National Parks.

Algoa Bay is known to support a high biodiversity of marine life, particularly reef-associated invertebrates and fish, as well as several breeding colonies of endangered or vulnerable seabirds and a suite of cetaceans. For these reasons, the National Protected Areas Expansion Plan (SANBI 2009) proposed a Marine Protected Area (MPA) in Algoa Bay, which would adjoin the Greater Addo Elephant National Park (GAENP). Detailed research and planning for the MPA began in 2006, and has culminated in the current zonal boundaries for the MPA. As such planning of future development around Coega must take the footprint of the MPA into account before construction is authorised. This is necessary to prevent habitat important for ecosystem health from being damaged or lost (Anchor Environmental, 2016).

It should be noted that the 'Notice Declaring the Addo Elephant Marine Protected Area Under Section 22A of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)' permits outfalls within the MPA.

Relevance to the proposed project:

The proposed project site is partially located within the Addo National Park (particularly Jahleel Island) and the declared Addo Elephant Marine Protected Area (stretching from the eastern breakwater past the Sundays River Mouth).

Biodiversity Policy and Strategy for South Africa: Strategy on Buffer Zones for National Parks

The strategy on buffer zones for National Parks was originally established due to the increasing rate and extent of development in and around National Parks, resulting in the isolation of National Parks from wider natural areas. The function of the Buffer Zone is to reduce /mitigate the negative influences that activities in close proximity to National Parks may have on the Park. The function also includes integration of Parks into surrounding landscapes.

The main purpose of the Buffer Zone is thus to:

- "Protect the purpose and value of the National Park which is to be explicitly defined in the management plan submitted in terms of section 39(2) of the Act;Protect important areas of high value for biodiversity and/or to society where these extend beyond the boundary of the Protected Area;
- Assist adjacent and affected communities to secure appropriate and sustainable benefits from the National Park and buffer zone area itself by promoting a conservation economy, ecotourism and its supporting infrastructure and services, and sustainability through properly planned harvesting."

According to this strategy, the establishment of a buffer zone around a National Park should be considered if the area is necessary for the proper conservation and effective protection of the National Park and would assist in achieving its objectives. This strategy also states that "*the buffer zone is an area surrounding a National Park which has complementary legal and management restrictions placed on its use and development, aimed at providing an extra layer of protection to the integrity of the National Park.*" This strategy is specifically geared towards sections relating to protected areas as well as Goal 1.4 (Environmentally sound and sustainable development adjacent to protected areas).

A Buffer Zone has the following six (6) objectives:

1. Ensure the persistence of important species and ecological processes;
2. Promote broad based and sustainable economic activity;
3. Preserve, adapt, restore and stabilize cultural heritage and secure the sustainable use thereof;
4. Preserve and improve the quantity and quality of water from catchments in the park and the buffer zone;
5. Protect, enhance and restore the unique and memorable character - the sense of place - that underpins the image of the National Park and their approaches, and
6. Protect and enhance the wilderness experience of park users.

The strategy stipulates that Buffer Zones must be established around National Parks in order to achieve the above goals. These buffer zones should be defined as priority natural areas, catchment protection areas and viewshed protection areas, and be identified by Government and integrated into management plans and Municipal Spatial Frameworks. These may then be established by publication in the Gazette or where appropriate, be declared as protected environments in terms of the Act.

In terms of implementing the buffer zone strategy, the DEFF is responsible for implementing the specific provisions of National Environmental Management legislation, as they relate to buffer zones, while SANParks is responsible for the management of National Parks. The National Park buffer zones, as defined in the park management plan, can be considered special areas in terms of section 24(2)(b) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The strategy also states that all development in a formally established buffer zone that requires an environmental authorisation in terms of the NEMA, will be subject to an environmental impact assessment process at national level. The Department's decision will be

informed by the management authority's (SANParks) opinion on the potential impact on the National Park.

Relevance to the proposed project:

The proposed project area falls within the Addo Elephant National Park buffer zone.

The National Heritage Resources Act (25 of 1999)

The protection of archaeological and paleontological resources is the responsibility of a provincial heritage resources authority and all archaeological objects, paleontological material and meteorites are the property of the State. "*Any person who discovers archaeological or paleontological objects or material or a meteorite in the course of development must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority*".

Relevance to the proposed project:

- No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or paleontological site or grave older than 60 years without a permit issued by the responsible provincial heritage resources authority.
- No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter or deface archaeological or historically significant sites.

Occupational Health and Safety Act (85 of 1993)

The objective of this Act is to provide for the health and safety of persons at work (See Table 3.4 below). In addition, the Act requires that, "*as far as reasonably practicable, employers must ensure that their activities do not expose non-employees to health hazards*" (Glazewski, 2005: 575). The importance of the Act lies in its numerous regulations, many of which will be relevant to the proposed development. These cover, among other issues, noise and lighting.

Table 3.4: Health and safety of persons at work according to the Occupational Health and Safety Act

8: GENERAL DUTIES OF THE EMPLOYERS TO THEIR EMPLOYEES	
(1)	Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees.
(2)	Without derogating from the generality of an employer's duties under subsection (1), the matters to which those duties refer include in particular- a) The provision and maintenance of systems of work, plant and machinery that, as far as is reasonably practicable, are safe and without risks to health; b) Taking such steps as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to the safety or health of employees, before resorting to personal protective equipment; d) Establishing, as far as is reasonably practicable, what hazards to the health or safety of persons are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used in his business, and he shall, as far as is reasonably practicable, further establish what precautionary measures should be taken with respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons, and he shall provide the necessary means to apply such precautionary measures; e) Providing such information, instructions, training and supervision as may be necessary to ensure, as far as is reasonably practicable, the health and safety at work of his employees; f) As far as is reasonably practicable, not permitting any employee to do any work or to produce, process, use, handle, store or transport any article or substance or to operate any plant or machinery, unless the precautionary measures contemplated in paragraphs (b) and (d), or any other precautionary measures which may be prescribed, have been taken; g) Taking all necessary measures to ensure that the requirements of this Act are complied with by

8: GENERAL DUTIES OF THE EMPLOYERS TO THEIR EMPLOYEES	
	every person in his employment or on premises under his control where plant or machinery is used; h) Enforcing such measures as may be necessary in the interest of health and safety; i) Ensuring that work is performed and that plant or machinery is used under the general supervision of a person trained to understand the hazards associated with it and who have the authority to ensure that precautionary measures taken by the employer are implemented; and authority as contemplated in Section 37 (1) (b).
14: GENERAL DUTIES OF EMPLOYEES AT WORK Every employee shall at work:-	
(a)	Take reasonable care for the health and safety of himself and of other persons who may be affected by his acts or omissions;
(b)	As regards any duty or requirement imposed on his employer or any other person by this Act, cooperate with such employer or person to enable that duty or requirement to be performed or complied with;
(c)	Carry out any lawful order given to him, and obey the health and safety rules and procedures laid down by his employer or by anyone authorized thereto by his employer, in the interest of health or safety;
(d)	If any situation which is unsafe or unhealthy comes to his attention, as soon as practicable report such situation to his employer or to the health and safety representative for his workplace or section thereof, as the case may be, who shall report it to the employer; and
(e)	If he is involved in any incident which may affect his health or which has caused an injury to himself, report such incident to his employer or to anyone authorized thereto by the employer, or to his health and safety representative, as soon as practicable but not later than the end of the particular shift during which the incident occurred, unless the circumstances were such that the reporting of the incident was not possible, in which case he shall report the incident as soon as practicable thereafter.
15: DUTY NOT TO INTERFERE WITH, DAMAGE OR MISUSE THINGS [S. 15 substituted by S. 3 of Act No. 181 of 1993.]	
	No person shall intentionally or recklessly interfere with, damage or misuse anything which is provided in the interest of health or safety.

Relevance to the proposed project:

- The developer must be mindful of the principles and broad liability and implications contained in the OHSA and mitigate any potential impacts.

Hazardous Substances Act (15 of 1973)

The Act aims to manage hazardous substances. It is the principal national legislation that controls the transportation, and manufacturing, storage, handling, treatment or processing facilities for any substance that is dangerous or hazardous (Groups I-IV).

Relevance to the proposed project:

- Manage the hazardous substances in such a manner that it does not endanger human health or the environment.
- Prevent hazardous substances from being used for an unauthorised purpose.

Relevant Noise Legislation

Specific noise legislation and the following standards have been used to aid the study and guide the decision-making process with regards to noise pollution:

- South Africa - GNR.154 of January 1992: Noise control regulations in terms of section 25 of the Environment Conservation Act (ECA), 1989 (Act No. 73 of 1989).
- South Africa - GNR.155 of 10 January 1992: Application of noise control regulations made under section 25 of the Environment Conservation Act, 1989 (Act No. 73 of 1989).
- South Africa - SANS 10103:2008 Version 6 - The measurement and rating of environmental noise with respect to annoyance and to speech communication.

- South Africa - SANS 10210:2004 Edition 2.2 – Calculating and predicting road traffic noise.
- South Africa - SANS 10357:2004 Version 2.1 - The calculation of sound propagation by the Concawe method.
- NMBM noise control by-law 37 of 2010

The ambient noise level guidelines in SANS 10103:2008 is 70dBA during the day and 60dBA at night in industrial districts. These levels can thus be seen as the target levels for any noise emissions within the SEZ.

SANS 10103:2008 provides typical rating levels for noise in various types of districts, as described in Table 3.5.

Table 3.5: Typical rating levels for noise in various types of districts.

Type of District	Equivalent Continuous Rating Level, LReq.T for Noise					
	Outdoors (dB(A))			Indoors, with open windows (dB(A))		
	Day-night	Daytime	Night-time	Day-night	Daytime	Night-time
Rural Districts	45	45	35	35	35	25
Suburban districts with little road traffic	50	50	40	40	40	30
Urban districts	55	55	45	45	45	35
Urban districts with one or more of the following: Workshops; business premises and main roads	60	60	50	50	50	40
Central business districts	65	65	55	55	55	45
Industrial districts	70	70	60	60	60	50

Furthermore, the South African noise control regulations describe a disturbing noise as any noise that exceeds the ambient noise by more than 7dB. This difference is usually measured at the complainant's location should a noise complaint arise. Therefore, if a new noise source is introduced into the environment, irrespective of the current noise levels, and the new source is louder than the existing ambient environmental noise by more than 7dB, the complainant will have a legitimate complaint.

Guidelines for expected community responses to excess environmental noise is reflected in Table 3.6 below.

Table 3.6: Categories of environmental community / group response (SANS 10103:2008).

EXCESS Lr dB (A)	ESTIMATED COMMUNITY/GROUP RESPONSE	
	CATEGORY	DESCRIPTION
0 - 10	Little	Sporadic complaints
5 - 15	Medium	Widespread complaints
10 - 20	Strong	Threats of community / group action
> 15	Very Strong	Vigorous community / group action

3.3.2 Municipal By-Laws and Planning

There will be certain requirements related to health and safety during construction and approval of method statements. Certain activities related to the proposed development may, in addition to National legislation, be subject to control by municipal by-laws including the Nelson Mandela Bay Metropolitan Municipality (NMB Metro) Integrated Development Plan (IDP) and Spatial Development Framework (SDF).

NMBM SDF (2015)

A review of the metro's 2009 Spatial Development Framework (SDF) was completed, resulting in the compilation of the approved 2015 SDF, outlining the desired spatial development of the metropolitan area as contemplated in the Spatial Planning and Land Use Management Act, 2013 (SPLUMA). The SDF provides basic guidelines for a land use management system, and highlights priority investment and development.

The Human Settlements Strategic Framework was adopted by Council in December 2012 and recommended spatial restructuring of the city through the following interventions:

- *Urban Renewal Precincts*: including Inner City areas, Motherwell, Happy Valley, Lower Baakens Valley, Walmer, Gqebera, Korsten, Helenvale and Greater Ibhayi-Northern Areas Hub;
- *Spatial Transformation Precincts*: such as Parsonsvlei, Coega SEZ / Motherwell, Bay West and N2 Developments;
- *Implementation of an Integrated Zoning Scheme and Land Use System*; and
- *Assembly of well-located public and private land for development of Integrated Human Settlements.*

The SDF seeks to generate means to support and enhance urban development. Various interventions may be utilised to support economic growth and development, based on a number of considerations, such as:

- The importance of linking the residents of the NMB Metro to opportunities;
- Directing investments to places where they will have the greatest effect;
- Protecting and enhancing natural and cultural resources for sustainability and enriching the experience of NMB Metro; and
- Weaving the growth of NMB Metro strongly into the economic fabric of the Eastern Cape Province.

A wide range of activity nodes or areas exist in the Metro which accommodates a variety of activities. These can be divided into four main core areas, namely:

- Port Elizabeth
- Uitenhage
- Despatch
- ***Coega SEZ and the Port of Ngqura***

The SDF recognises the SEZ as a major industrial node in the NMB Metro:
"Coega SEZ (CDC): The development of the Coega SEZ presents a great potential for job creation and economic growth nearby suburbs, especially Wells Estate, Bluewater Bay, Amsterdamhoek and Motherwell, and the whole Municipality. It is proposed that gap-housing opportunities be created in these residential suburbs in order to accommodate the workforce anticipated from the development of the SEZ. Such residential developments, to meet the growth needs, should be located closer to the Coega SEZ'

Coega Open Space Management Plan (2014) and Coega IDZ Development Framework Plan (2006)

The CDC compiled, with advice from Gibb Africa and Metroplan, a Development Framework Plan (DFP) for the Coega SEZ (previously referred to as the Coega IDZ). This DFP aims to provide an overall development strategy for the Coega IDZ by identifying a series of defined objectives so that the implementation of the Coega IDZ can progress from concept to detailed planning and design. The DFP is based on a range of clusters and activity nodes. It achieves this by:

- Providing a robust but flexible land use, transportation and infrastructure strategy for the Coega site,
- Ensuring that the strategy conforms with National Policy for the planning of Development Zones, confirming that the strategy is consistent with local planning initiatives, commitments and objectives, and
- Demonstrating that the strategy is based on previous feasibility studies, and current "best practice", as demonstrated in similar projects.

An Open Space Management Plan was prepared by CES (2006) and revised and approved in 2014, to provide ecological input into the DFP. The OSMP identifies sensitive ecological areas, and areas of high biodiversity, to ensure that spatial planning considered the ecological setting. Ecological corridors and areas of high biodiversity or where unique fauna and flora occur were identified and where possible incorporated into the DFP.

Nelson Mandela Bay Metropolitan Municipality Coastal Management Program (2015)
The NEM:ICMA was developed to facilitate holistic and integrated management of the coast that allows for conservation of the coastal environment as well as equitable access to, and sustainable use of, coastal resources. Section 48 of the Act specifies the need for municipalities to prepare coastal management programs to facilitate management of the coastal zone, and to review these every 5 years. The Coastal Zone of the NMBM extends from the Van Stadens River in the west to the Sundays River in the east.

The main purpose of the CMP is:

- To protect, enhance and maintain the social, economic, cultural and environmental integrity of the coast;
- To encourage a sense of ownership and value of coastal resources amongst the public through environmental education and awareness thereby allowing enhanced community participation in maintaining the diversity of coastal ecosystems;
- To allow equitable access to and sustainable utilisation of natural coastal resources by all members of the community, and in so doing enhance their quality of life;
- To promote development within the coastal zone in a sustainable manner in which stakeholder participation and scientific integrity are the basis for responsible decision-making;
- To promote the rehabilitation of currently spoilt and degraded coastal environments;
- To ensure coastal zone integrity and biodiversity is sustained for the enjoyment of current and future generations through the protection of coastal ecosystems and resources; and
- To realise coastal management is a dynamic and continuous process that requires an interdisciplinary approach.

4. ENVIRONMENTAL AND SOCIAL BASELINE

4.1 INTRODUCTION

This chapter provides background information on the biological, physical (biophysical) and social environment of the surrounding area and the proposed project site. The section draws on the Final Scoping Report drafted by CEN: IEM Unit (CEN Integrated Environmental Management Unit, March 2017: *Final Scoping Report for the Proposed Establishment of a Common User Integrated Marine Abstraction and Discharge Servitude and associated Landbased Infrastructure for Industries in the Coega Industrial Development Zone, Nelson Mandela Bay Municipality, Eastern Cape*, CEN IEM Unit, Port Elizabeth), as well as municipal and local planning tools and any additional published and unpublished material. The environmental baseline section looks at aspects relating to climate, topography, geology, soils, flora, fauna, the marine environment and inland water bodies, and although based mainly on literature, includes observations from an initial site visit. The social baseline addresses the demographic profile, education, health, social services and economy of the region.

4.2 TOPOGRAPHY AND HYDROLOGY

4.2.1 Topography

Topography of the landward component of the study area comprises a series of dunes along the coast which rise over a distance of approximately 500 m to a relatively flat plain at an altitude of approximately 60 m.a.s.l. on either side of the Coega River. The landform of majority of the area is described as "*level plains with some relief*". The mobile transverse dunes on the eastern side of the Port are more pronounced with steep faces, in comparison to the narrower dunefield on the south-western side of the Port. The topography of the Coega estuary and adjacent dunefields has been significantly altered firstly by the establishment of the Saltworks and more recently by the excavation of the deep-water Port and establishment of harbour-related infrastructure.

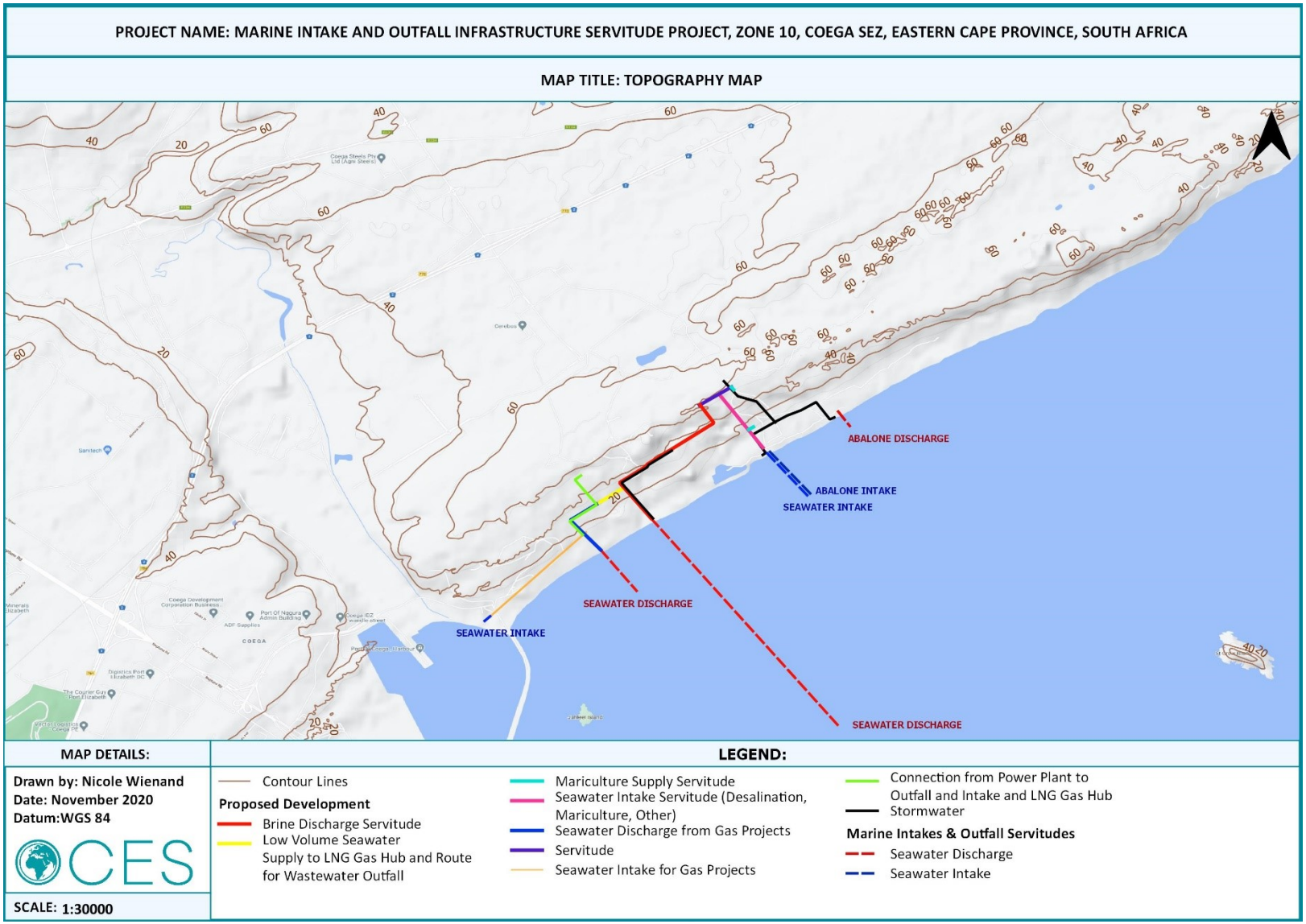


Figure 4.1: Contour map of the proposed project area.

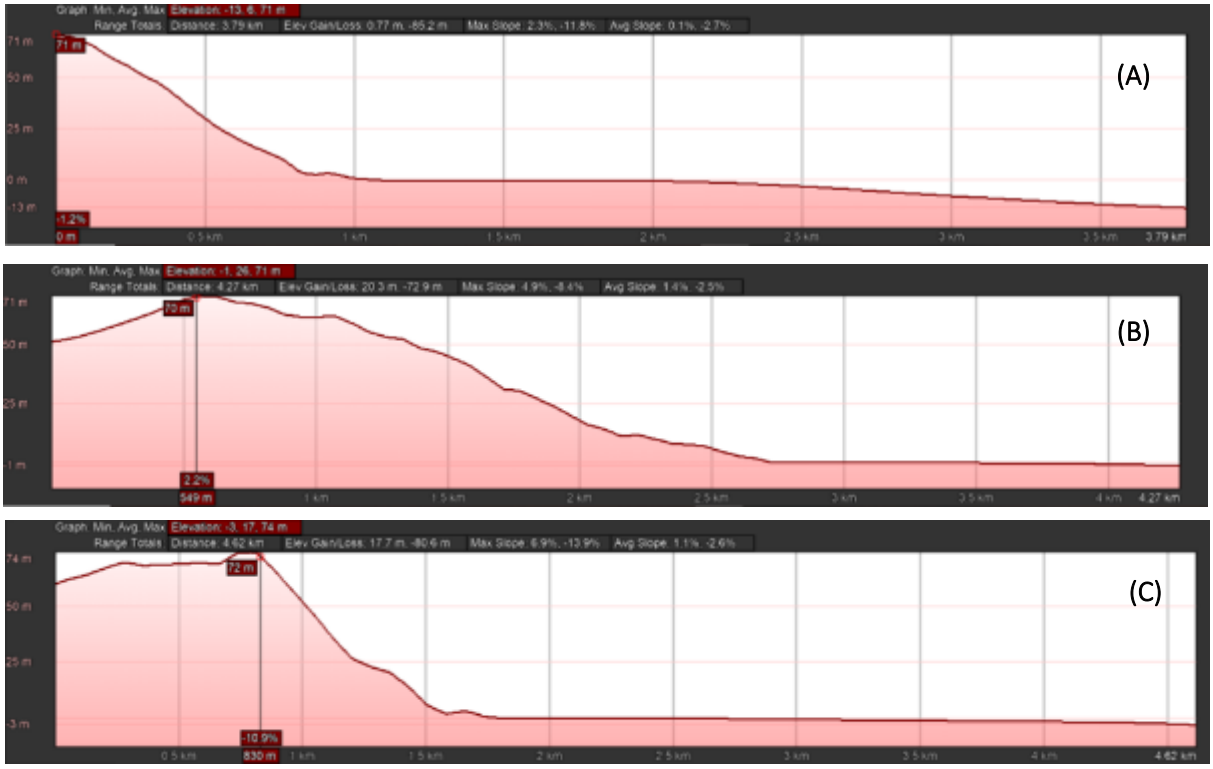


Figure 4.2: Elevation profiles of the proposed development site (a) Inland to the Sea (b) East – West (c) North - South.

4.2.2 Surface Hydrology

There are two surface water features in the study area, the Butterfly Valley and the Coega River. The Butterfly Valley is a seasonal watercourse that drains into the lower reaches of the Coega River, and has been highlighted as an environmentally sensitive area in a number of publications completed for the Coega SEZ and Port Ngqura.

The Coega River is a relatively small sand-bed river in the Coega SEZ. The National Freshwater Ecosystems Priority Areas project, has earmarked several important catchments (sub-quaternaries) based either on the presence of important biota (e.g. rare or endemic fish species) or conversely the degree of riverine degradation, i.e. the greater the catchment degradation the lower the priority to conserve the catchment. The important catchment areas are then classified as Freshwater Ecosystems Priority Areas (NFEPAs). The Coega River is mapped as a Class B river on NFEPA (i.e. largely natural). The river has a catchment area of 550 km^2 and mean annual runoff of 13 x 106 m^3. The section of the river south of the N2 has been modified in various ways, including diversion into a trapezoidal earth channel approximately 3.3 km upstream of the river mouth, the location of a commercial saltworks within the flood plain of the river downstream of the N2 highway bridge (de Souza and Mackintosh, 2000), development of the port and infrastructural development (e.g. roads, bridges, pipelines). The lower reaches in particular have been extensively modified, and are expected to be further impacted on as the Coega SEZ and Port develops. In their 'Preliminary catchment management guidelines for the Coega River', GIBB (1999) describes the present ecological status of the lower reaches of the river as class F (using the river classification guidelines developed by the Department of Water Affairs). Class F rivers are 'Critically modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat'. The extent of the 1:100 year floodline of the river has been mapped in the area north of the N2 and the R334 to the western

border of the SEZ. The SEZ's most recent Open Space Management Plan identifies the riparian area as a critical biodiversity area.

The National Spatial Biodiversity Assessment (2011) includes the section of the Coega River from the harbour to approximately 3 km upstream of the N2 crossing as an estuary. The estuarine functional zone has been delineated and the current health category of the estuary is rated as 'F' (i.e. Critically/Extremely modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions and processes have been destroyed and the changes are irreversible) (NSBA, 2011: Volume 3).

The NFEPA identifies six natural wetlands in the landward study area:

- One channelled valley bottom wetland;
- Two unchannelled valley bottom wetlands;
- Two depressions; and
- One bench wetland.

Wetlands are protected in terms of the National Water Act and any activity within 500 m of a wetland needs a Water Use Authorisation in terms of Section 21 of the Act.

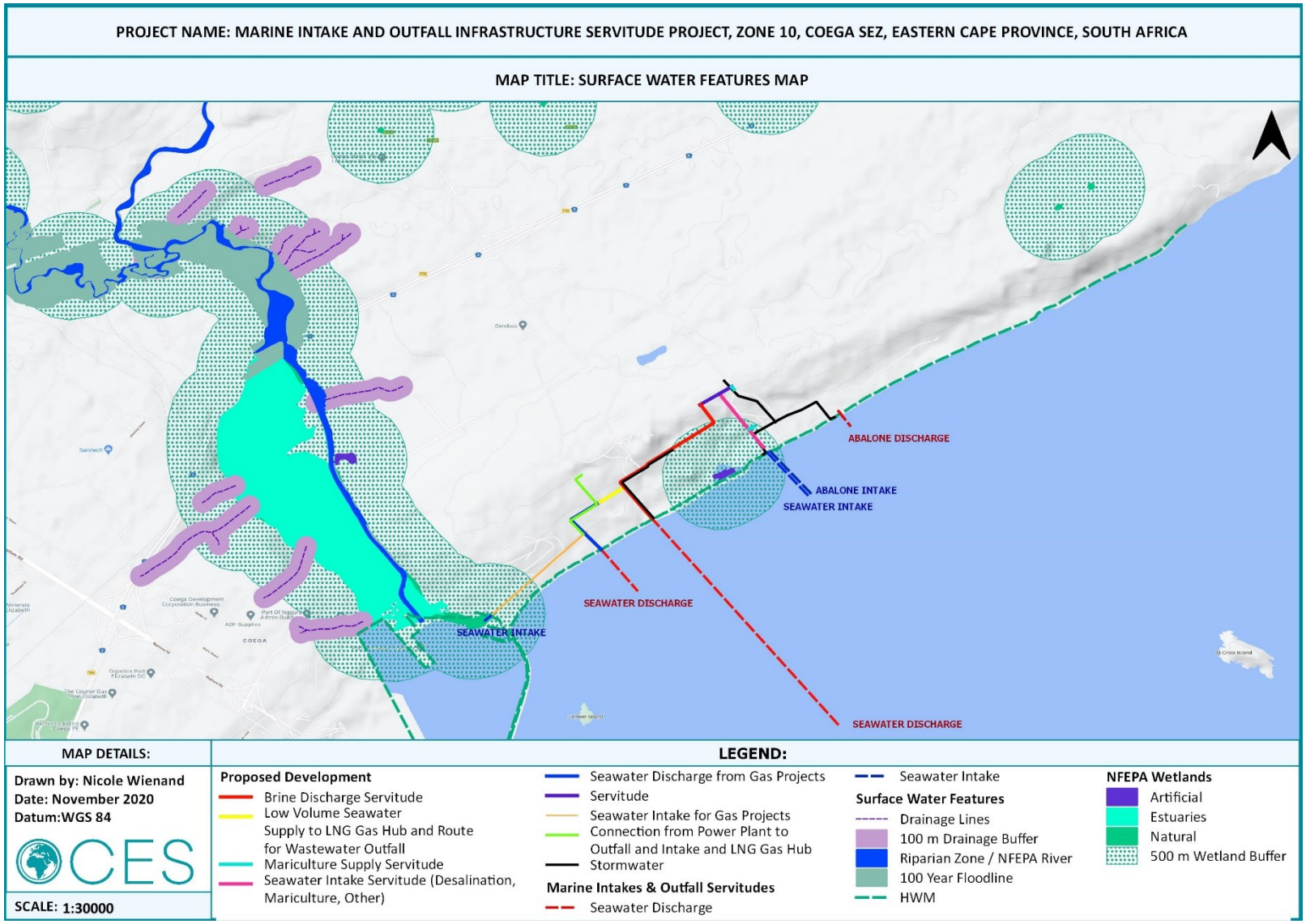


Figure 4.3: Surface hydrology features surrounding the proposed project area.

4.2.3 Groundwater

The southern portion of the Coega SEZ is underlain at depth by an artesian aquifer (Coega Ridge Aquifer). The aquifer is a vital source of freshwater inflow and nutrients to the coastal zone in the Algoa Bay region, contributing to the high productivity rates in this coastal area.

The aquifer is formed by sandstones and quartzites of the Table Mountain Group and is confined by a succession of eastward-thickening Cretaceous formations up to 1,200 m thick near the coast. It is the only artesian system of practical importance in South Africa. Overexploitation of the artesian system has caused several drops in yields that led to regulation of drilling and abstraction.

Groundwater in the Coega Ridge Aquifer flows in an easterly direction and has been carbon fourteen dated at 28,000 years near Coega Kop. Water quality remains relatively constant along its flow path. pH is slightly acidic because of oxidation of pyrite in the Table Mountain Group. It is not likely that groundwater will be polluted or contaminated as it is protected by an aquiclude and is an artesian system.

4.3 CLIMATE

The Eastern Cape has a complex climate. There are wide variations in temperature, rainfall and wind patterns, mainly as a result of movements of air masses, altitude, mountain orientation and the proximity of the Indian Ocean. Climate data is readily available for Coega from the CDC's Saltworks Air Quality Monitoring Station.

The wind regime for the Coega Saltworks area is dominated by westerly to north-westerly flow fields representing the pre-frontal conditions; and south-westerly flow fields representing the frontal conditions. The south-easterly and south-westerly wind flow (i.e. land breeze) increases during daytime conditions while westerly and north-westerly wind flow regimes increases during the night (sea breeze). The proposed project area is subject to strong winds from the west and west-south-west (41% combined frequency) all year round, and east (15%) from October through to March. These winds occur mainly throughout the day and may generate a significant amount of fugitive dust. Diurnal variations in the wind regime occur which are due to the influence of land-sea breeze circulation on the airflow of the region (Figure 4.4).

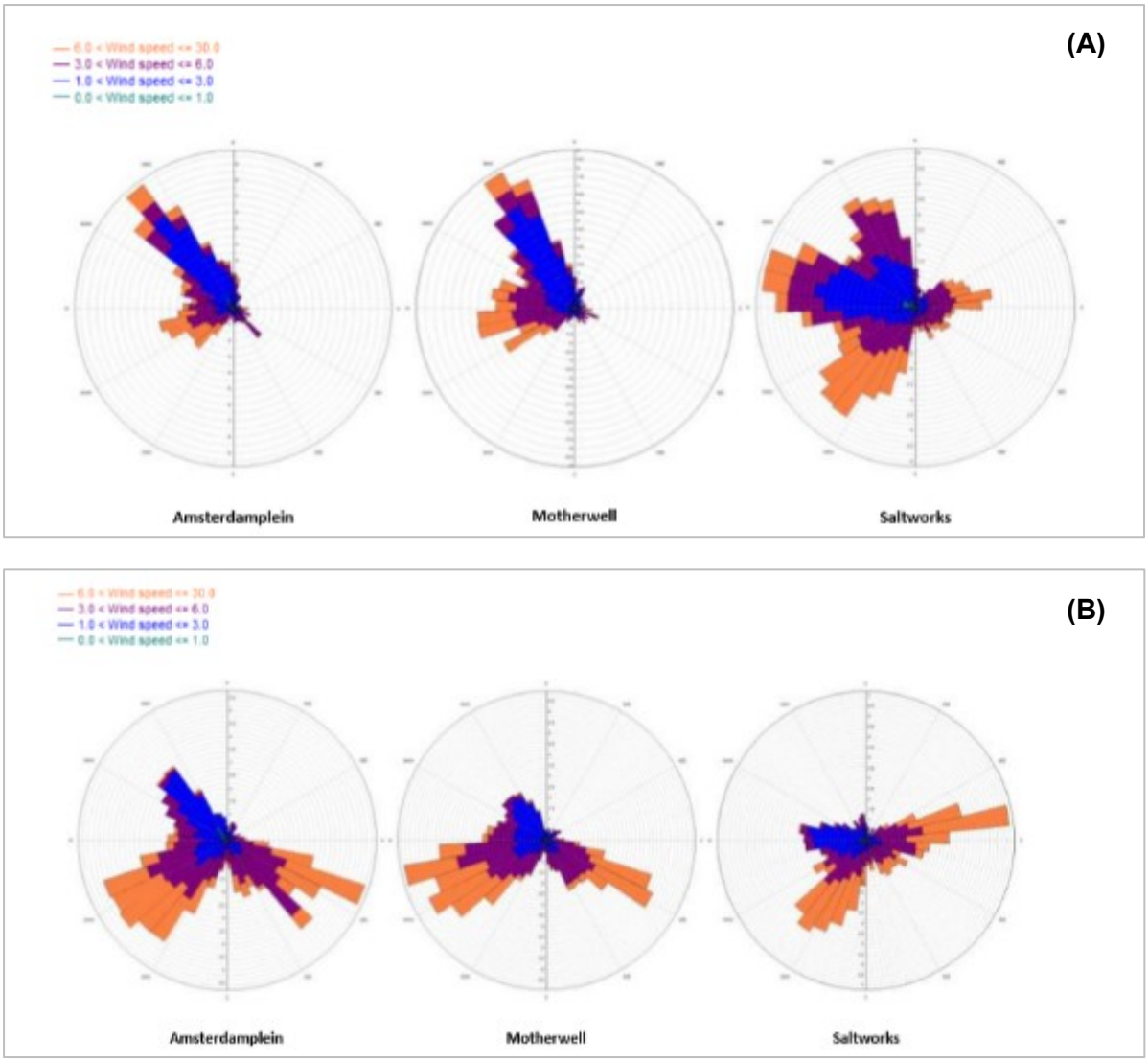


Figure 4.4: (A) Winter seasonal Wind Rose of Amsterdamplein, Motherwell and Saltworks wind speed and prevailing direction in 2019 (B) Summer seasonal Wind Rose of Amsterdamplein, Motherwell and Saltworks wind speed and prevailing direction in 2019 (Source: Coega SEZ Annual Ambient Air Quality Report, 2019).

Coega has a bimodal rainfall pattern with 255.6 mm of rain recorded at the Saltworks monitoring station from January to December 2019. Rainfall peaked in autumn and summer. On average, November had the most rainfall days with January having the least (Figure 4.5). Coega is situated near the junction of the temperate and subtropical climatic regions, and it has a warm temperate climate with the average daily temperature of 18ºC. The maximum temperatures recorded at Coega are 40ºC, while the minimum temperatures recorded are 3ºC. Exceptionally high temperatures may be experienced during berg wind conditions, which occur frequently during autumn and winter. Extreme temperatures also occur during summer, with little accompanying wind (Figure 4.5).

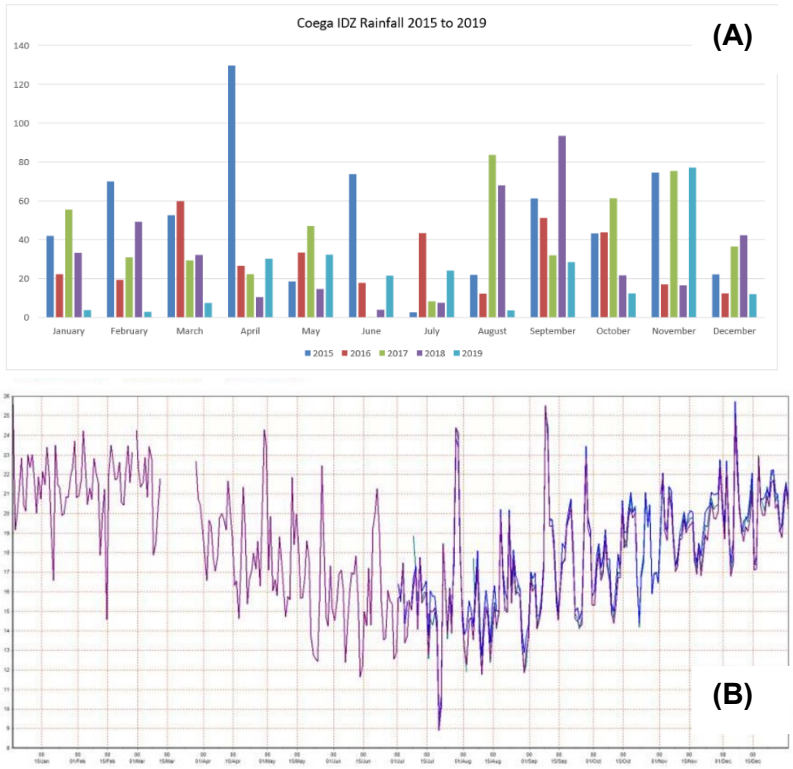


Figure 4.5: (A) Average rainfall data recorded at Coega from 2015 to 2019 (B) Daily average ambient temperatures recorded at Coega from January 2019 to December 2019 (Source: Coega SEZ Annual Ambient Air Quality Report, 2019).

4.4 GEOLOGY AND SOILS

The geology underlying the project area comprises of Quaternary alluvial deposits consisting of unconsolidated coastal sand and calcrete deposited during sea level changes of the Quaternary Period. These Quaternary alluvial deposits overly the Alexandria Formation of the Algoa Group – a 13 m thick package consisting of basal conglomerates rich in oyster shells, calcareous sandstones, pebbly coquina (cemented shells) and thin conglomerates typical of coastal and estuarine environments. The deposition of these layers is thought to have occurred during the marine transgression and regression cycles of the middle Miocene to Pliocene age. Consequently, the Alexandria Formation contains an abundance of marine invertebrate fossils such as bivalves, gastropods, corals, bryozoans, brachiopods and echinoids. Aeolianites of the Nanaga, Nahoon and Schelm Hoek Formations overlie the Alexandria formation in some places within the broader area (Johnson *et al*., 2006).

The geology of the Coega SEZ is characterised by coastal limestone, overlain by calcareous sands blown onshore. Three marine incursions and subsequent limestone deposition phases seem to have occurred, each progressively younger and at lower altitude seaward. The geology towards the sea consists of unconsolidated sands and fluvial sediments within the Coega floodplain. The land north of the N2 national road is dominated by coastal limestone.

The soils of the Coega SEZ can be described as relatively deep, red, lime-rich sandy clay loams. The proposed site is characterised by coastal sands, and sandy soils and lime-containing lithosols.

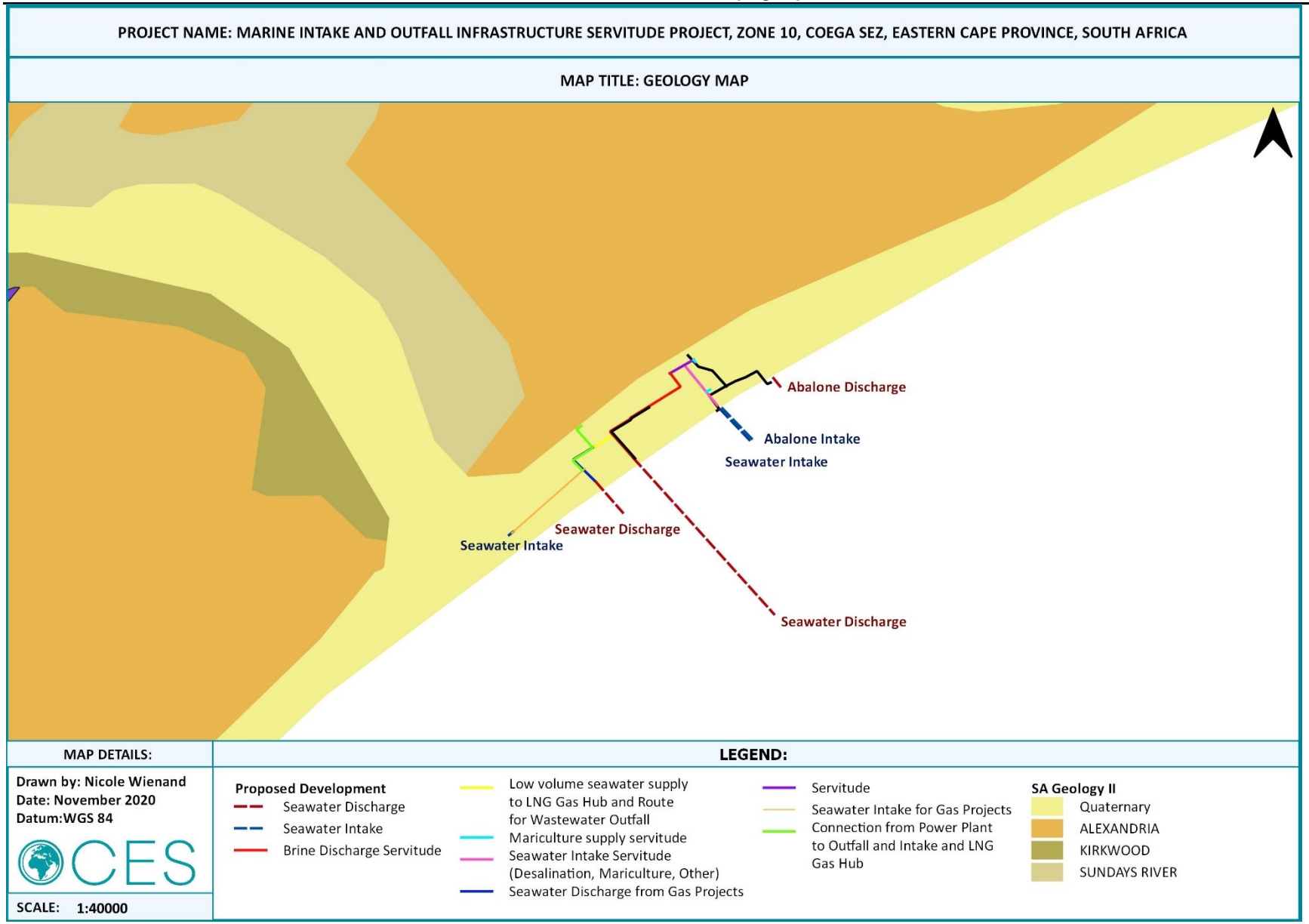


Figure 4.6: Geology of the proposed project site.

4.5 FLORA

4.5.1 National – Mucina and Rutherford

The South African Vegetation Map (SA VEGMAP) of 2018 is an important resource for biodiversity monitoring and conservation management in South Africa. Under the custodianship of the South African National Biodiversity Institute (SANBI) the SA VEGMAP, (2018) was updated in order to 'provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before'. The map provides a detailed description of each of South Africa's unique vegetation types along with a comprehensive list of the important species associated with each, including endemic and biologically important species. According to the SA VEGMAP (2018) spatial dataset, the vegetation of the proposed project area consists of:

- Cape Seashore Vegetation and
- St Francis Dune Thicket.

These vegetation types are all classified as 'least threatened'.

Cape Seashore Vegetation

Cape Seashore Vegetation occurs along the coast in the Western Cape and Eastern Cape Provinces. The conservation status of this vegetation type is classified as 'Least Threatened' (Figure 4.8). The conservation target (percent of area) as set by the NSBA is 20%. Almost half of this vegetation type is statutorily conserved in the West Coast, Cape Peninsula Agulhas, proposed Garden Route and Greater Addo Elephant National Parks as well as the Rocher Pan, Cape Columbine, Dassen island, Wolvengat, Kleinmond, Walker Bay, De Mond (Ramsar site), De Hoop, Kleinjongensfontein, Geelkrans, Robberg, (all Western Cape), and Cape St Francis, Cape Recife, Joan Muirhead, Gxulu, Cape Henderson, Kwelera and Bosbokstrand Nature Reserves (all Eastern Cape). A number of private conservation areas such as Donkin Bay, Robben Island, Rein's Coastal Reserve and Tharfield Nature Reserve protect other considerable portions of the Cape Seashore Vegetation. Only about 1.7% has been transformed, mainly by urban development.

St Francis Dune Thicket

St Francis Dune Thicket occurs on flat to moderately undulating coastal dunes from Tsitsikama River Mouth to Sundays River Mouth within the Eastern Cape Province. It is characterised by a mosaic of low (1-3 m) thicket and asteraceous fynbos. The thicket component is dominated by small bush clumps, consisting of small trees and woody shrubs, which are best developed in fire-protected dune slacks while the fynbos component occurs on dune slopes and crests. The fynbos component becomes less prominent towards the eastern distribution of this vegetation type. The geology underlying this vegetation type is mainly restricted to the Schelm Hoek Formation (Grobler *et al.,* 2018).

St Francis Dune Thicket is classified as poorly protected, with a Conservation Target of 19%. Approximately 14.13% of this vegetation type has been transformed due to mining, alien invasion by Acacia cyclops, urban sprawl and erosion (Grobler *et al.,* 2018).

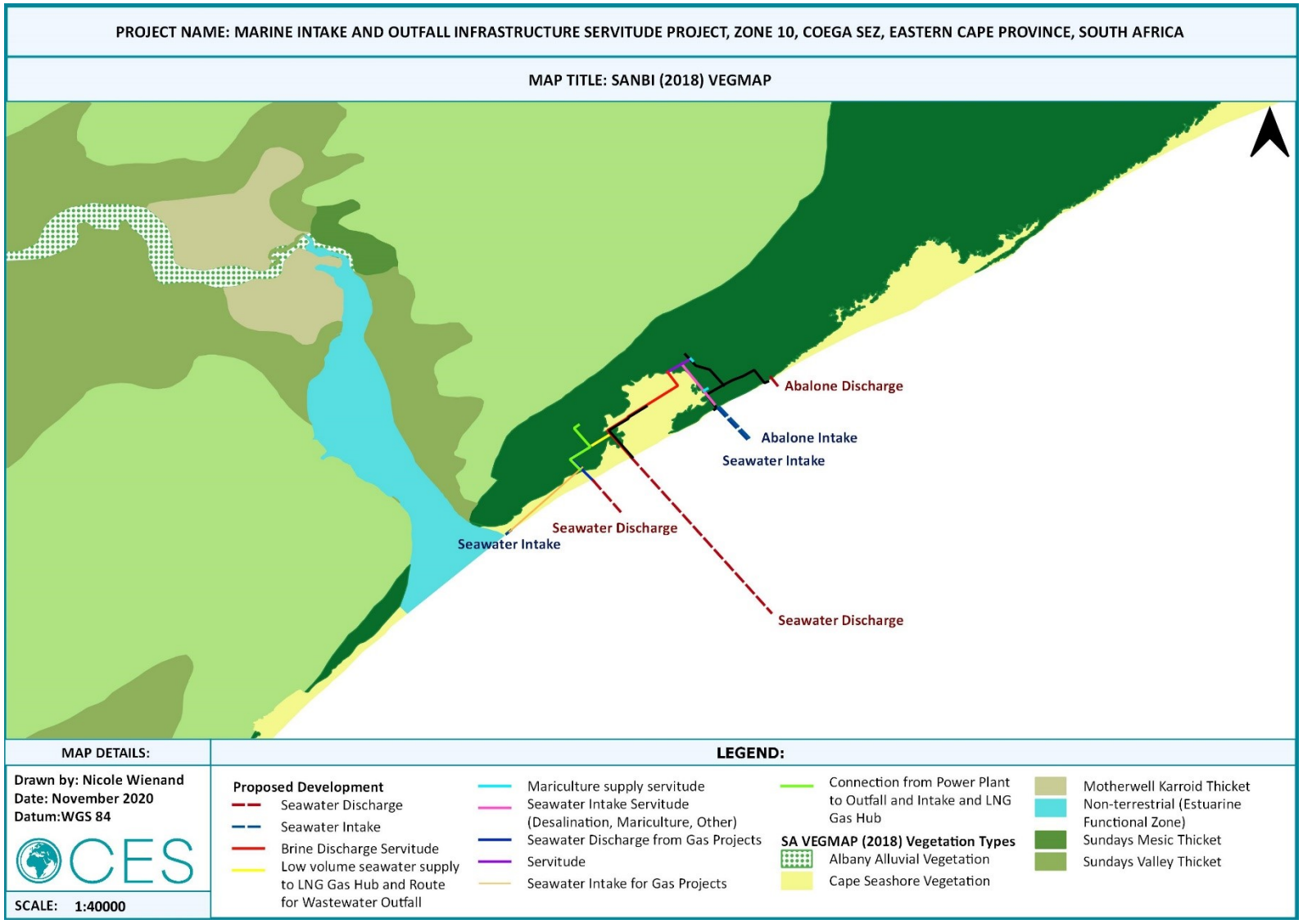


Figure 4.7: National vegetation classification of the proposed project area (Mucina and Rutherford, 2018).

4.5.2 Provincial – Eastern Cape Biodiversity Conservation Plan (2019)

The ECBCP (2019) replaces the ECBCP (2007) in its entirety and provides a map of important biodiversity areas, outside of the Protected Areas network, which can be used to inform land use and resource-use planning and decision making. The objectives of the ECBCP (2019) are to:

1) Identify the minimum spatial requirements needed to maintain a living landscape that continues to support all aspects of biodiversity and retain/maintain essential ecological infrastructure. This is achieved through the selection of areas, based on achieving targets, which represent important biodiversity pattern AND ecological processes;
2) Serve as the primary source of biodiversity information for land use planning and decision-making and
3) Inform conservation and restoration action in important biodiversity areas.

The aim of the ECBCP were to map biodiversity priority areas through a systematic conservation planning process. The main outputs of the ECBCP include Protected Areas (PA), Critical Biodiversity Areas (CBA), Ecological Support Areas (ESA), Other Natural Areas (ONA) and No Natural Habitat Remaining (NNR) for both terrestrial and aquatic ecosystems.

The ECBCP (2019) recognises the previously published and gazetted Nelson Mandela Bay Metropolitan Plan (2014 as revised) and the Coega Development Corporation Open Space System (2014) which has been mapped at a finer scale with detailed expert input and stakeholder engagement and legally enforced and implemented by the responsible agencies. Since it is not desirable for the ECBCP (2019) CBAs and ESAs to be in conflict with the CBAs in neither of these two existing plans, they have been incorporated without modification into the ECBCP (2019). It should be noted however, that as a consequence, the ECBCP (2019) is unable to meet specific biodiversity targets (ECBCP 2019 Handbook). As such, the ECBCP aquatic CBAs has only been mapped (see Figure 4.8 below) as the terrestrial CBAs have been mapped with the NMBM MOSS (2009) and Coega OSMP (2014) (see Figure 4.10 and 4.11, respectively).

According to the ECBCP (2019), the study area falls within an aquatic ESA 1. The management requirements for these areas are as follows:

Maintain ecological function within the localised and broader landscape. A functional state in this context means that the area must be maintained in a semi-natural state such that ecological function and ecosystem services are maintained.

For areas classified as ESA1, the following objectives apply:

- These areas are not required to meet biodiversity targets, but they still perform essential roles in terms of connectivity, ecosystem service delivery and climate change resilience.
- These systems may vary in condition and maintaining function is the main objective, therefore:
    - Ecosystems still in natural, near natural state should be maintained.
    - Ecosystems that are moderately disturbed/degraded should be restored.

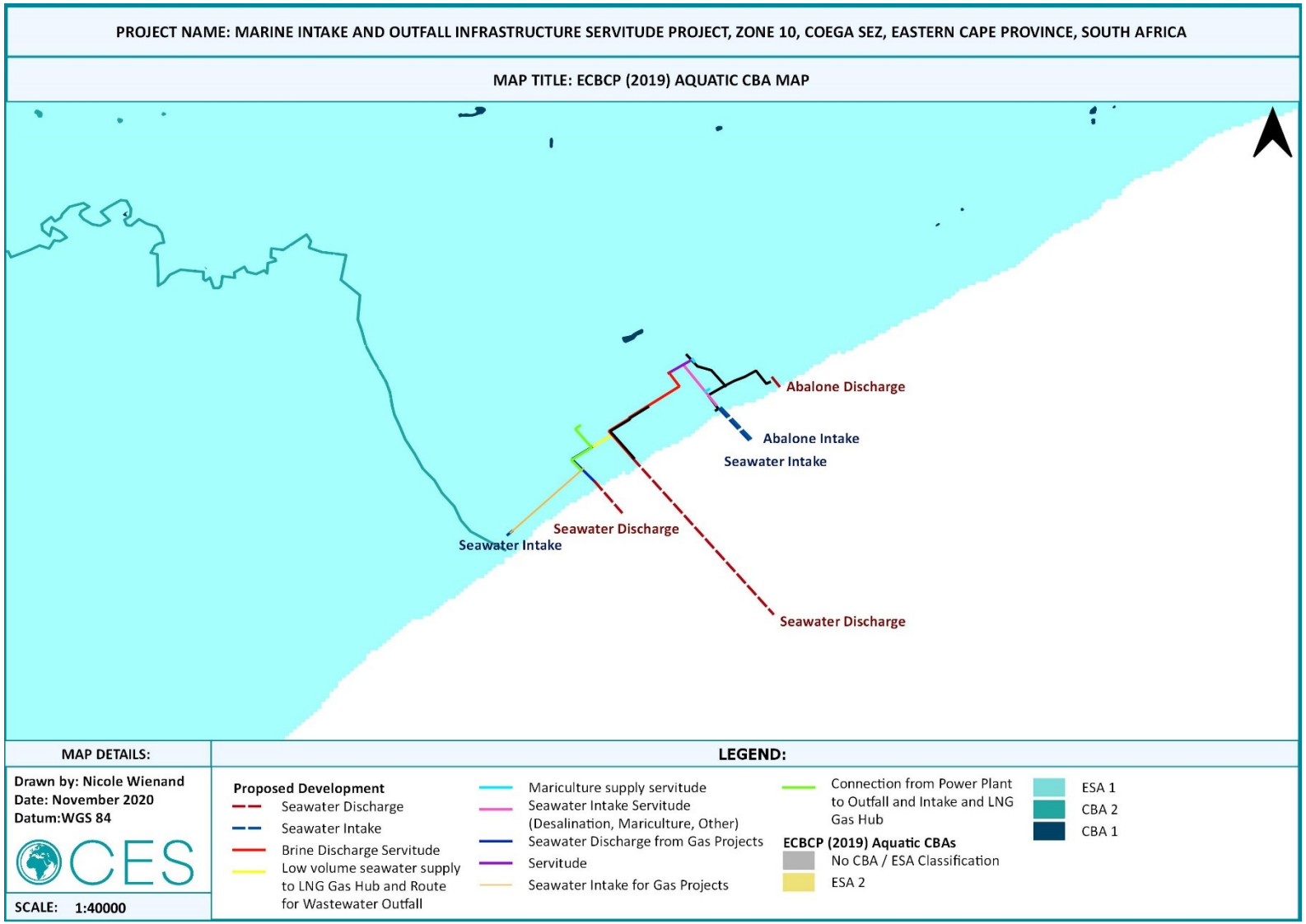


Figure 4.8: Aquatic CBA map of the proposed project area (ECBCP, 2019).

4.5.3 Local – The Metropolitan Open Space System

The MOSS defines the following vegetation types in the study area

Sandy Beaches - classified as Azonal beach types dominated by the deposition of sand. Approximately 86.7% of the intact habitat remains. This vegetation type is classified as "Least Threatened".

Algoa Dune Thicket is a subtropical thicket vegetation type dominated by protected trees such as the Milkwood (*Sideroxylon inerme*) and Candlewood (*Pterocelastrus tricuspidatus*). Waxberry shrubs are abundant in this vegetation type and rare succulents such as *Cotyledon adscendens* are characteristic. This vegetation type is present on calcareous sandstone, silt/siltstone, shelly limestone and coquinite. Approximately 38.4% of the intact vegetation remains. This vegetation type is classified as "Vulnerable".

A Conservation Assessment and MOSS plan was done for the Nelson Mandela Bay Municipal area in 2009. According to this plan, the majority of the land based infrastructure falls within a CBA (refer to Figure 4.10).

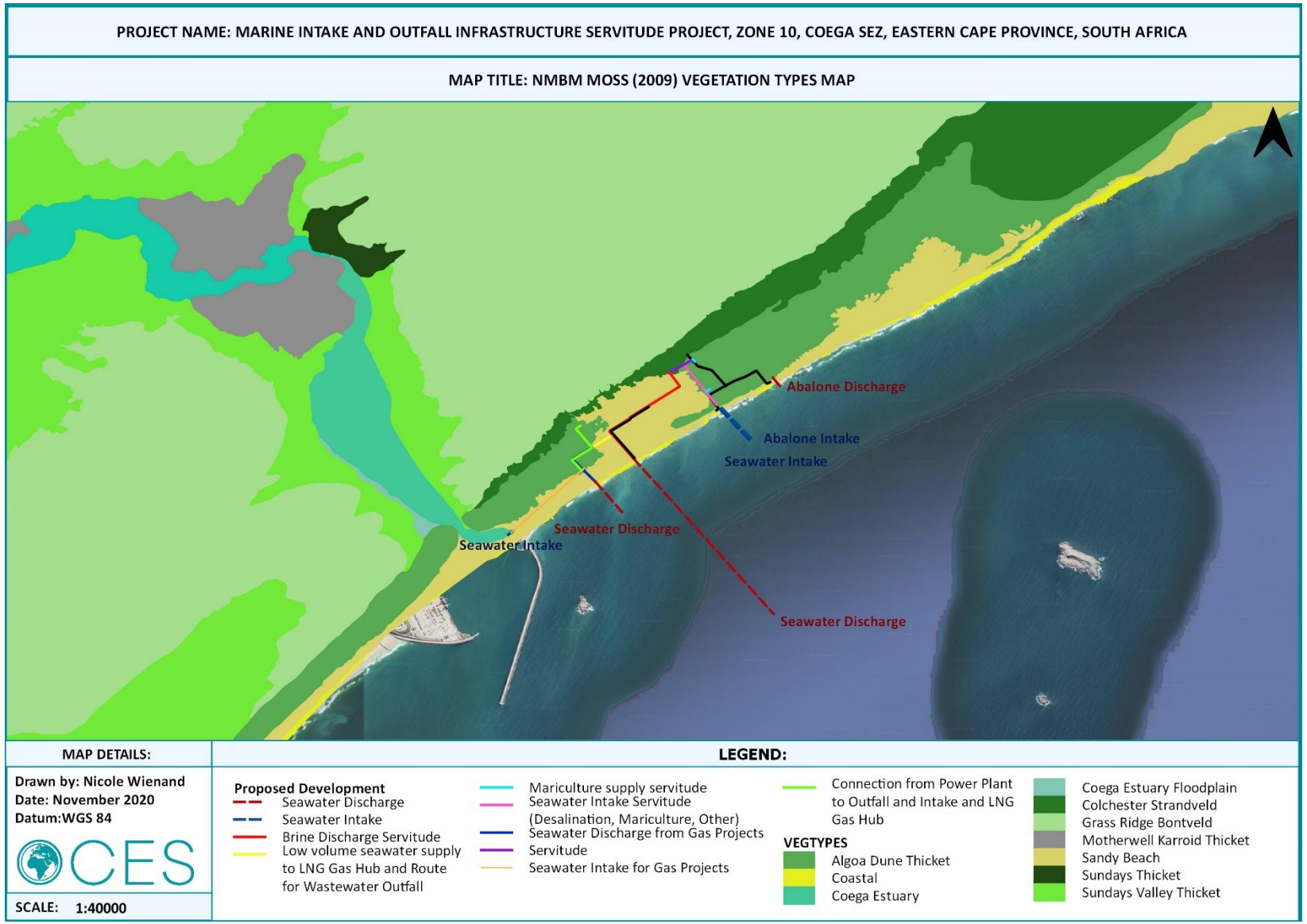


Figure 4.9: Vegetation Map of the proposed project area (MOSS, 2009).

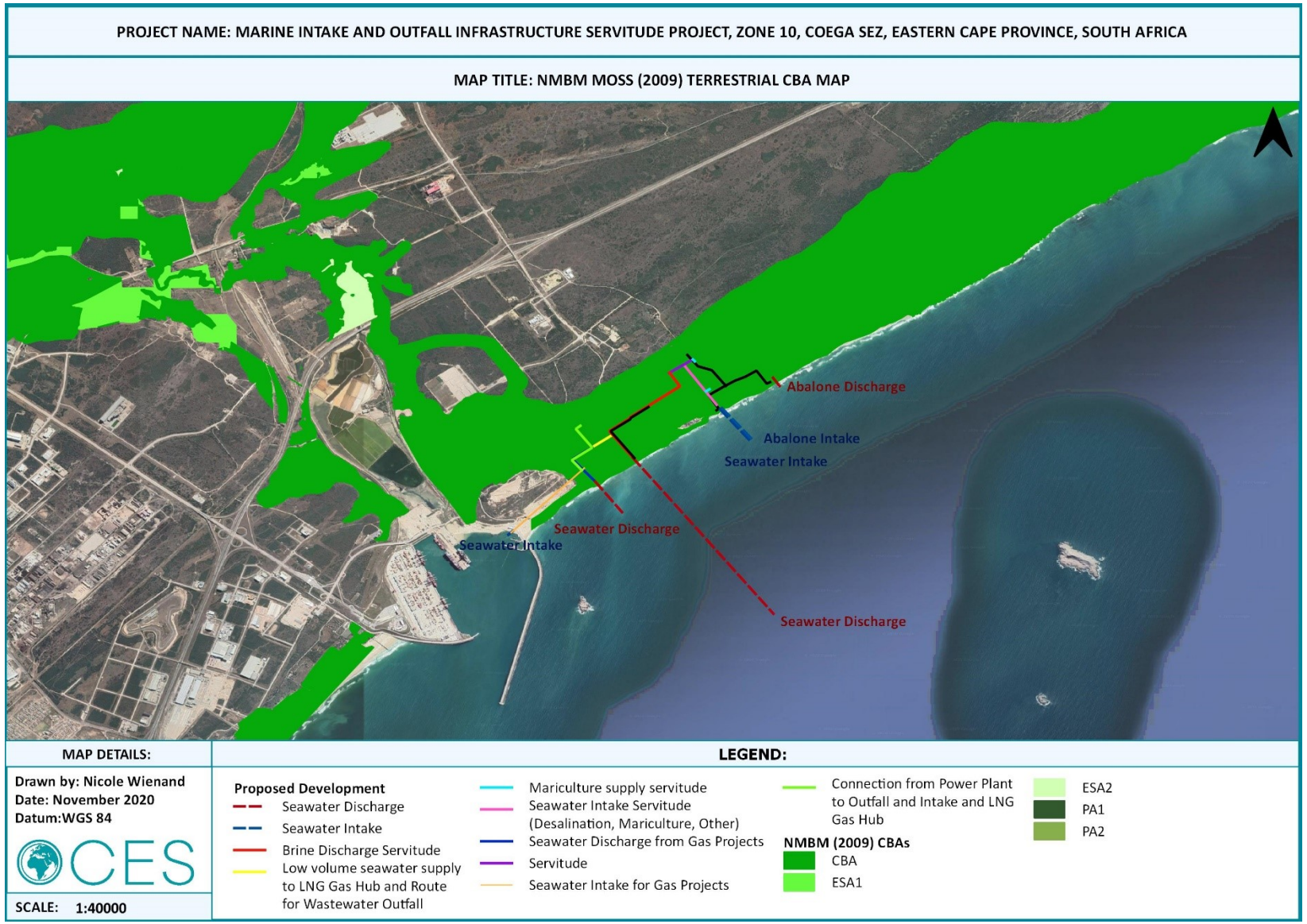


Figure 4.10: Critical Biodiversity Areas of the proposed project area (MOSS, 2009).

4.5.4 Nelson Mandela Bay Metropolitan Municipality Coastal Management Program (2015)

The Coega River has been largely modified as a result of habitat transformation (most notably the saltworks, Port of Ngqura and the N2 in the lower reaches). The upper extent of the estuary has been delineated in the NSBA assessment (2011) to be ~3 km upstream of the N2 crossing. The current health category of the estuary is rated as 'F' (i.e. Critically/Extremely modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions and processes have been destroyed and the changes are irreversible) (NSBA, 2011: Volume 3).

Detailed floodline data for the Coega River was not obtained. The saltpans in the Coega estuary were identified as wetlands by Schael et al. (in prep.) in the western section of the segment. The southern portion of the Coega IDZ is underlain at depth by an artesian aquifer (Coega Ridge Aquifer). The aquifer is a vital source of freshwater inflow and nutrients to the coastal zone in the Algoa Bay region, contributing to the high productivity rates in this coastal area.

The terrestrial habitat surrounding the estuary and the coastal dunefield are classified as critical biodiversity areas in the NMBM MOSS and ECBCP. The dunefield on either side of the harbour is part of a greater sand process corridor stretching from the Sundays to the Swartkops Rivers, and is part of the greater Alexandria dunefield which is one of the largest active dunefields in the world. An Open Space Management Plan has recently been approved for the Coega IDZ (2014) which indicates key areas that need to be managed as open space. Guidelines have been developed to facilitate the management of these areas.

The St Croix island group (Jahleel, St Croix and Brenton islands) occurs within the area identified as 'Agulhas Island' habitat in the NSBA (2011). These islands, together with the Bird Island group provide critical habitat for threatened bird species (and are listed as an Important Bird Area) – • they are the only islands off southern mainland Africa where Sterna dougallii (Roseate Tern) breeds regularly • the island group holds large numbers of Sterna vittata (Antarctic Tern), which roost on the island in winter • the islands are home to 43% of the global population of the Spheniscus demersus (African Penguin), the majority of which are on St Croix. This is the only colony with a positive population growth • St Croix also holds a locally significant breeding population Phalacrocorax capensis (Cape Cormorant).

The St Croix island group is part of the Greater Addo Elephant National Park and has been incorporated in the proposed MPA adjacent to Segments 1 and 2.

Six bird species recorded within the coastal dune habitat are identified as species of conservation concern and are listed in the South African Red Data Book. These are the roseate tern, Sterna dougalli, chestnutbanded plover, Charadrius pallidus, whitefronted plover, Charadrius marginatus, African black oystercatcher, Haematopus moquini, Damara tern, Sterna balaenarum and Caspian tern, Hydroprogne caspia. There is a nesting record for Damara terns (South Africa's most rare breeding seabird) to the east of the Coega River mouth (Watson and Randall, 1995). Dr Paul Martin has recorded a breeding colony of Damara Terns in two dune slacks approximately 200 m west of the old Marine Growers facility (S33 46.979 E25 42.904).

A number of archaeological sites and 1 paleontological site, as well as a historical building (Hougham Park homestead) were identified in the coastal zone by specialists in surveys of the Coega IDZ.

4.5.5 Local – Coega Open Space Management Plan

The Coega Open Space Management Plan (OSMP, 2014) was approved by the Department of Environment, Forestry, and Fisheries (DEFF), formerly the Department of Environmental Affairs (DEA), and provides important spatial information on the various land uses, open spaces, and CBA's within the Coega SEZ. The OSMP forms the basis for environmental and planning authorisations and sets out the uses of the open space areas, thereby serving as an important tool guiding development plans and management guidelines within the Coega SEZ.

The primary objectives of the OSMP are to:

- Promote preservation of the environment where natural systems and/or specific habitats require it.
- Manage and preserve the cultural resources within the open spaces of Coega SEZ
- Manage and preserve land for its aesthetic or passive recreational value, for active recreational use, and for its contribution to the quality of life of the concessionaires, tenants and the public.
- Meet recreation space demands as well as provide natural amenities for the SEZ working population.
- Ensure proper management of open space areas.
- Ensure that linkages to neighbouring open space areas are maintained.
- Use education to promote and accomplish the goals of the environmental vision for Coega SEZ.
- Address the social & cultural needs of workers and families if and where desired.
- Promote educational opportunities within the SEZ and enhance the level of environmental awareness of the workers within the SEZ.
- Improve environmental quality by means of development guidelines to ensure the SEZ can compete with other alternative locations on a global scale.

The development of the OSMP was a mandatory requirement in terms of the legislative framework applicable to the area and was initially established on the findings of the original Strategic Environmental Assessment (SEA) undertaken for the Coega SEZ. The OSMP is updated from time to time, depending on the changing needs of the Coega SEZ and the availability of updated biodiversity information. The data used to inform the information contained in this report is based on the 2014 OSMP – the latest, most up to date version of the Coega OSMP and as such the most up to date spatial dataset. Site sensitivities are therefore based on information from this dataset as depicted in Figure 4.11 included below.

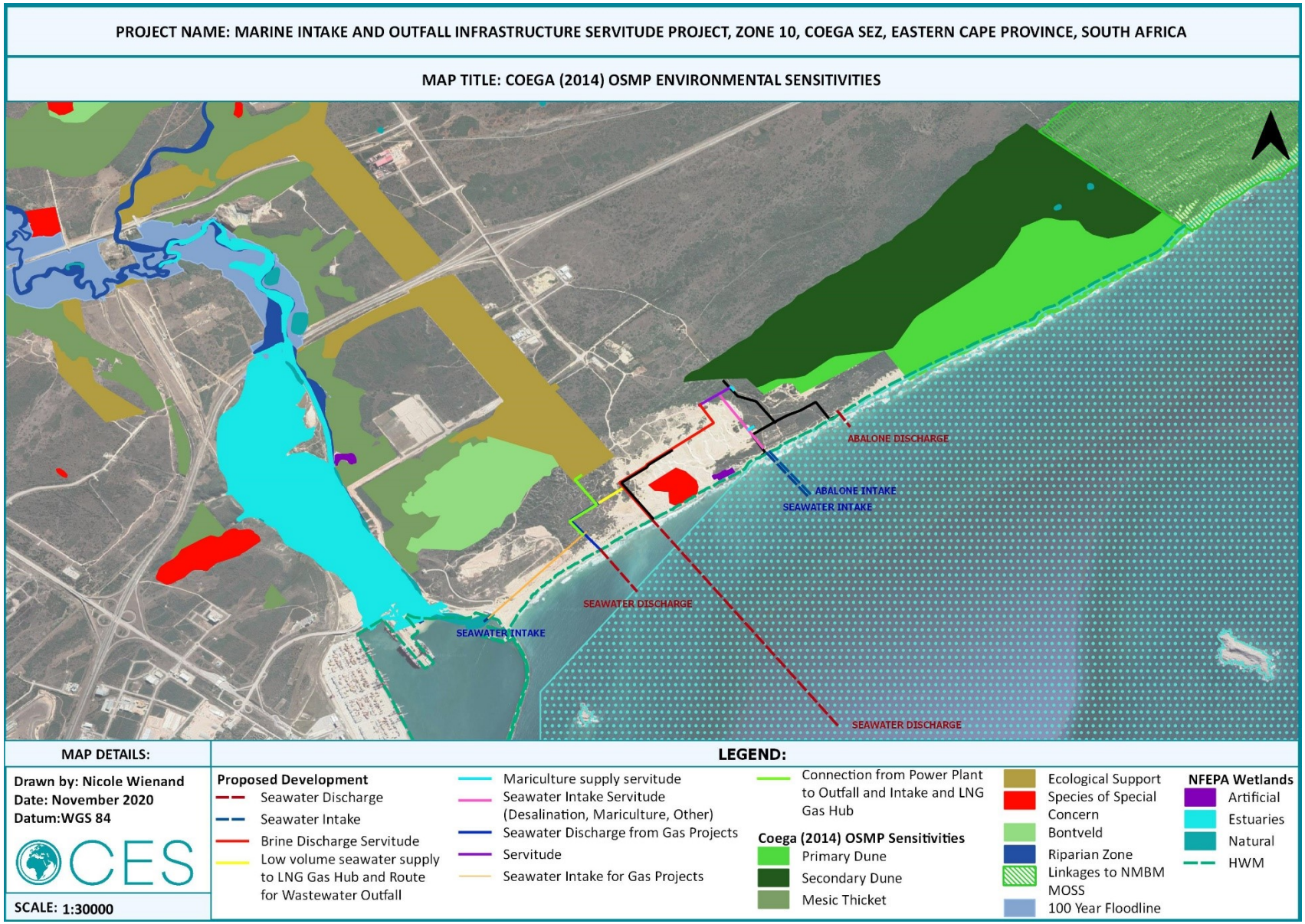


Figure 4.11: Site sensitivities as described by the Coega OSMP.

4.5.6 Floristics

Potential Species of Conservation Concern (SCC) which are likely to occur within the vegetation types within the project area are derived from plants listed in terms of the IUCN, the South African Red Data List, Provincial Nature Conservation Ordinance PNCO and national legislation (NEMBA). QDS 3325DC and 3325DA were consulted to compile the relevant species lists. Based on historical records for the region, it is likely that two Critically Endangered species, five Endangered species, two Protected and two Near Threatened species occur in this area (SIBIS, 2015). All three *Encephalartos* spp. are found on the NEM:BA lists, whilst 11 species were listed on the PNCO. These can be seen in Table 4.1 below. In addition to the above, *Leucadendron argenteum* and *Sideroxylon inerme* are listed as protected trees under the national protected tree species list (National Forest Act).

Table 4.1: Species of Conservation Concern that are likely to occur within the study site

SCIENTIFIC NAME	IUCN	SA RED DATA LIST	NEMBA	PNCO	PROTECTED TREES
Carissa Bispinosa	-	Least Concern	-	Schedule 4	-
Corpuscularia lehmannii	-	Critically Endangered	-	-	-
Cotyledon adscendens	-	Endangered	-		-
Encephalartos horridus	Endangered	Endangered	Endangered	Schedule 3	-
Encephalartos caffer	Near Threatened	Protected	Protected-	Schedule 3	-
Encephalartos lehmannii	Near Threatened	Protected	Protected-	Schedule 3	-
Euyops cf ericifolius	-	Endangered	-	-	-
Gomphocarpus physocarpus	-	Least concern	-	Schedule 4	-
Haworthia fasciata	-	Near Threatened	-	-	-
Ledebouria coriacea	-	Critically Endangered	-	-	-
Leucadendron argenteum	Vulnerable	Endangered	-	Schedule 3	Protected tree
Marsilea schelpeana	Vulnerable	-	-	-	-
Rapanea gilliana	Vulnerable	-	-	-	-
Rhombophyllum rhomboideum	Endangered	Endangered	-	-	-
Sarcostemma viminale	-	Least Concern	-	Schedule 4	-
Scadoxus puniceus	-	Least Concern	-	Schedule 4	-
Sideroxylon inerme	-	Least Concern	-	-	Protected Tree
Strelitzia cf juncea	-	Vulnerable	-	Schedule 4	-
Tritoniopsis antholyza	-	Least Concern	-	Schedule 4	-
Watsonia pillansii	-	Least Concern	-	Schedule 4	-

4.6 FAUNA

South Africa is a diverse country, with approximately 1,663 terrestrial vertebrate faunal species of which 850 species are birds, 343 species are mammals, 350 species are reptiles and 120 species are amphibians spread across seven biomes and 122 million km².

It should be noted that during recent search and rescue procedures undertaken within the SEZ, the Eastern Cape Golden Baboon Spider (Threatened) have been discovered in the area. To date, 7 spiders have been relocated to open space areas in Zone 10 of the SEZ.

4.6.1 Amphibians

Amphibians are an important and often neglected component of terrestrial vertebrate faunas. They are well represented in sub-Saharan Africa, from which approximately 600 species have been recorded (Frost, 1985). However, distribution patterns in southern Africa are uneven both in terms of species distribution and in population numbers (du Preez and Carruthers, 2009). A relatively rich amphibian fauna occurs in the Eastern Cape, where a total of 32 species and sub-species occur. This represents almost a third of the species known from South Africa. Knowledge of amphibian species diversity in the study area is limited. However, according to the Animal Demographic Unit's Reptile Database, 16 species of frog have been documented in the Quarter Degree Square that the project area falls in. Of these 16 species, none are listed on the IUCN Red List nor as a schedule 1 on the PNCO list. However, all frogs and toads are listed as schedule 2 species on the PNCO list and are therefore considered species of conservation concern. Permits will be required for the removal of all frogs and toads.

4.6.2 Reptiles

South Africa has 350 species of reptiles, comprising 213 lizards, 9 worm lizards, 105 snakes, 13 terrestrial tortoises, 5 freshwater terrapins, 2 breeding species of sea turtle and 1 crocodile (Branch, 1998). Of those 350 reptile species, the Eastern Cape is home to 133 which include 21 snakes, 27 lizards and eight chelonians (tortoises and turtles). The majority of these are found in Mesic Succulent Thicket and riverine habitats. The Animal Demography Unit (A University of Cape Town Research Unit) historical records indicate that 83 species of reptiles are likely to occur in the project site. Only one Near Threatened species (*Nucras taeniolata - Albany Sandveld Lizard)* and one Critically Endangered species (*Bitis albanica- Albany adder*) on the IUCN Red Data List are likely to be found in the study area (Table 4.2). However, all lizards and tortoises are listed as a schedule 2 species on the PNCO list and will therefore require permits for their removal.

Table 4.2: Reptile SCC likely to occur in the Project Area.

FAMILY	SCIENTIFIC NAME	COMMON NAME	RED LIST STATUS	PNCO
Colubridae	*Philothamnus semivariegatus*	Spotted Bush Snake	-	Schedule 2
Colubridae	*Duberria lutrix lutrix*	South African Slug-eater	-	Schedule 2
Colubridae	*Lamprophis aurora*	Aurora House Snake	-	Schedule 2
Colubridae	*Lycodonomorphus rufulus*	Brown Water Snake	-	Schedule 2
Colubridae	*Lycophidion capense capense*	Cape Wolf Snake	-	Schedule 2
Colubridae	*Philothamnus natalensis occidentalis*	Western Natal Green Snake	-	Schedule 2
Colubridae	*Prosymna sundevalli*	Sundevall's Shovel-snout	-	Schedule 2
Lacertidae	*Nucras taeniolata*	Albany Sandveld Lizard	Near threatened	Schedule 2

FAMILY	SCIENTIFIC NAME	COMMON NAME	RED LIST STATUS	PNCO
Viperidae	*Bitis albanica*	Albany Adder	Critically Endangered	Schedule 2

4.6.3 Mammals

Large game makes up less than 15% of the mammal species in South Africa and a much smaller percentage in numbers and biomass. In developed and farming areas, this percentage is greatly reduced, with the vast majority of mammals present being small or medium-sized.

Eighty-nine mammal species have distribution ranges which include the project area. According to NEMBA, three protected mammal species (South African Hedgehog, Honey Badger and Cape Fox) and one vulnerable species (Leopard) have distributions that coincide with the project area (Table 4.3). However, the likelihood of Leopard and/or Cape Fox occurring on site is **low** as human activity within the area is likely to force the species away from the site. The White tailed mouse, which has a distribution that coincides with the project area is listed as Endangered. Sclater's Mouse Shrew and Schreibers Long-fingered bat are both listed as Near Threatened on the IUCN Red List and have distributions which co-inside with the project area.

Table 4.3: Mammal SCC likely to occur in the Project Area.

Scientific Name	Common Name	IUCN	NEMBA	PNCO
Atelerix frontalis	South African hedgehog	-	Protected	Schedule 2
Mystromys albicaudatus	White-tailed mouse	EN	-	-
Mellivora capensis	Honey Badger	-	Protected	Schedule 2
Vulpes chama	Cape Fox	LC	Protected	-
Myosorex sclateri	Sclater's Mouse Shrew	NT		
Miniopterus schreibersii	Schreibers Long-fingered bat	NT	-	Schedule 2
Panthera pardus	Leopard	NT	Vulnerable	Schedule 2

4.6.4 Birds

According to Southern African Bird Atlas Project 2 (SABAP2) for the PENTAD 3345_2540, 217 bird species (including marine species) have distributions which incorporate the project area.

There are 38 threatened and 28 near-threatened species within the Eastern Cape Province and 22 threatened and 10 near-threatened species have a distribution which includes the project area (IUCN, 2020). Table 4.4 lists the bird species of conservation concern that have a distribution range which includes the project area and indicates those that have been recorded within ±80km^2. There are 17 South African endemic species that have a distribution which includes the Eastern Cape Province but there are no Eastern Cape endemics.

Of note is the Damara Tern (*Sterna balaenarum*) which is Critically Endangered in South Africa (Taylor et al., 2015). It is protected under a number of legal and conservation policies including the South African PNCA and protected under the gazetted Marine Threatened or Protected Species (TOPS) (GN 476 30 May 2017) as well as the international Agreement on the Conservation of African-Eurasian Migratory Waterbirds, Convention for the Conservation of Migratory Species of Wild Animals.

There are an estimated 54 breeding pairs of Damara Terns is South Africa and approximately 45 (83%) nested in Algoa Bay in 2018/19 (Dr Martin, 2019). One of the breeding sites is within the project area in the dunes near the old Abalone Farm, Zone 10 of Coega SEZ (Figure 4.12). According to the ongoing monitoring which started in 2007/08 usually 3-5 pairs breed each year however only 1-2 pairs laid eggs during the 2017/18 and 2018/19 breeding seasons (Dr Martin, 2019). Sites have been abandoned if they are located within 130-175m of the Mandela Sand & Stone boundary that is being actively worked (Dr Martin, 2019). A 200 m buffer around nesting sites are currently being implemented.

The following recommendations were made in the 2019 monitoring report:

- At the Abalone Farm colony the mining companies must ensure that no mining takes place at any time within the 200m buffer around the Damara Tern nesting locations. The buffer recommended in the Coega Mining Right EIA remains valid.
- Anglers in vehicles continue to illegally access the coastal zone in Zone 10 of the Coega SEZ. This may increase disturbance and attract predators such as gulls.
- Drivers of vehicles authorised to drive on the beach (applicable to the Alexandria Coast and Schelm Hoek) need to be aware of the presence of Damara Terns during the breeding season (October to March) and should keep below the high water mark. This is especially important at the Schelm Hoek colony.
- Management actions such as litter picking need to be carefully planned to minimise disturbance to breeding pairs.

The latest (2020) monitoring information for the Damara Tern (Coega Mining: Abalone Farm Site) was obtained from the CDC. Surveys were conducted on the 16th of October, the 12th of November and the 11th of December. Monitoring data showed that there were 2 adults flying around the Zone 10 dunefields on the 12th of November (i.e. on territory) and 2 birds feeding at sea opposite the old abalone Farm on the 11th of December. On 11th January 2021, a flock of 6 Damara terns were observed feeding in the shore break opposite the old abalone farm.

However, no nests have been observed this season to date. This will be the first season since 2014 that the Damara terns have not nested. However, on the 13th of November there were 4 nests and 2 pairs on territory at Schelmhoek. As this is considered to be early for this site (nesting usually only observed during December), it could be possible that the Damara Terns have relocated from the Abalone Farm site to the Schelmhoek Site. No change was observed in the Alexandria Dunefields site.

Table 4.4: Bird SCC with a distribution range that includes the project area.

Scientific Name	Common Name	SA Red Data Book (2015)	IUCN Global	TOPS - Terrestrial (No. 27306, 2005)	TOPS - Marine (GN 475, 2017)	PNCO	CITES (28 August 2020)	Recorded SABAP 2 (PENTAD 3345_2540)
Diomedea dabbenena	Tristan Albatross	Critically Endangered	Critically Endangered			Schedule 2		
Gypaetus barbatus	Bearded Vulture	Critically Endangered	Near-threatened	Endangered		Schedule 1	CITES II	
Oceanodroma leucorhoa	Leach's Storm-Petrel	Critically Endangered	Vulnerable		Critically Endangered	Schedule 2		
Sterna balaenarum	Damara Tern	Critically Endangered	Vulnerable		Critically Endangered	Schedule 2		
Belearica regulorum	Grey Crowned Crane	Endangered	Endangered	Endangered		Schedule 2		
Circus maurus	Black Harrier	Endangered	Endangered			Schedule 2		X
Gyps coprotheres	Cape Griffon	Endangered	Endangered	Endangered		Schedule 2	CITES II	
Phalacrocorax capensis	Cape Cormorant	Endangered	Endangered		Endangered	Schedule 2		X
Phoebetria fusca	Sooty Albatross	Endangered	Endangered		Endangered	Schedule 2		
Polemaetus bellicosus	Martial Eagle	Endangered	Endangered	Vulnerable		Schedule 2	CITES II	
Spheniscus demersus	African Penguin	Endangered	Endangered		Endangered	Schedule 1	CITES II	X
Thalassarche carteri	Indian Yellow-nosed Albatross	Endangered	Endangered		Endangered	Schedule 2		
Thalassarche chlororhynchos	Atlantic Yellow-nosed Albatross	Endangered	Endangered			Schedule 2		
Torgos tracheliotos	Lappet-faced Vulture	Endangered	Endangered	Endangered		Schedule 2	CITES II	
Turnix hottentottus	Hottentot Buttonquail	Endangered	Endangered			Schedule 2		
Neophron percnopterus	Egyptian Vulture	Extinct	Endangered	Critically Endangered		Schedule 2		
Diomedea amsterdamensis	Amsterdam Albatross		Endangered			Schedule 2		
Thalassarche salvini	Salvin's Albatross		Vulnerable			Schedule 2		
Diomedea exulans	Wandering Albatross	Vulnerable	Vulnerable		Vulnerable	Schedule 2		
Morus capensis	Cape Gannet	Vulnerable	Endangered		Vulnerable	Schedule 2		
Neotis denhami	Denham's Bustard	Vulnerable	Near-threatened			Schedule 2		

Scientific Name	Common Name	SA Red Data Book (2015)	IUCN Global	TOPS - Terrestrial (No. 27306, 2005)	TOPS - Marine (GN 475, 2017)	PNCO	CITES (28 August 2020)	Recorded SABAP 2 (PENTAD 3345_2540)
Procellaria aequinoctialis	White-chinned Petrel	Vulnerable	Vulnerable			Schedule 2		
Procellaria cinerea	Grey Petrel	Vulnerable	Near-threatened			Schedule 2		
Sagittarius serpentarius	Secretarybird	Vulnerable	Endangered			Schedule 2		X
Stephanoaetus coronatus	Crowned Eagle	Vulnerable	Near-threatened			Schedule 2	CITES II	
Anthropoides paradiseus	Blue Crane	Near-threatened	Vulnerable	Endangered		Schedule 2		X
Oxyura maccoa	Maccoa Duck	Near-threatened	Vulnerable			Schedule 2		
Ardenna carneipes	Flesh-footed Shearwater		Near-threatened			Schedule 2		
Ardenna grisea	Sooty Shearwater		Near-threatened			Schedule 2		
Buteo trizonatus	Forest Buzzard		Near-threatened			Schedule 2		
Calidris canutus	Red Knot		Near-threatened			Schedule 2		
Calidris ferruginea	Curlew Sandpiper		Near-threatened			Schedule 2		X
Campethera notata	Knysna Woodpecker	Near-threatened	Near-threatened			Schedule 2		X
Chaetops frenatus	Cape Rockjumper	Near-threatened	Near-threatened			Schedule 1		
Charadrius pallidus	Chestnut-banded Plover	Near-threatened	Near-threatened			Schedule 2		X
Circus macrourus	Pallid Harrier	Near-threatened	Near-threatened			Schedule 2		
Crithagra leucoptera	Protea Canary	Near-threatened	Near-threatened			Schedule 2		
Limosa lapponica	Bar-tailed Godwit		Near-threatened			Schedule 2		
Monticola explorator	Sentinel Rock-Thrush		Near-threatened			Schedule 2		
Numenius arquata	Eurasian Curlew	Near-threatened	Near-threatened			Schedule 2		
Phoeniconaias minor	Lesser Flamingo	Near-threatened	Near-threatened			Schedule 2	CITES II	X
Thalassarche cauta	Shy Albatross	Near-threatened	Near-threatened			Schedule 2		
Thalassarche steadi	White-capped Albatross		Near-threatened			Schedule 2		
Geocolaptes olivaceus	Ground Woodpecker	Least concern	Near-threatened			Schedule 2		

Important Bird Areas (IBA) are sites critical for the long-term survival of bird species that are globally threatened, have a restricted range, are restricted to specific biomes/vegetation types and/or have significant populations (Figure 4.12) (BirdLife SA, 2019). South Africa has 101 Global IBAs and an additional 21 Regional IBAs, 15 of which occur within the Eastern Cape Province. The nearest IBA to the project site is the Addo Elephant National Park IBA (refer to Figure 4.12).

One of the discharge servitudes extends into the boundary of the Algoa Bay Islands. However, the servitude will not be in close proximity to any of the islands (> 300 m) and will be at a depth of – 20 CD.

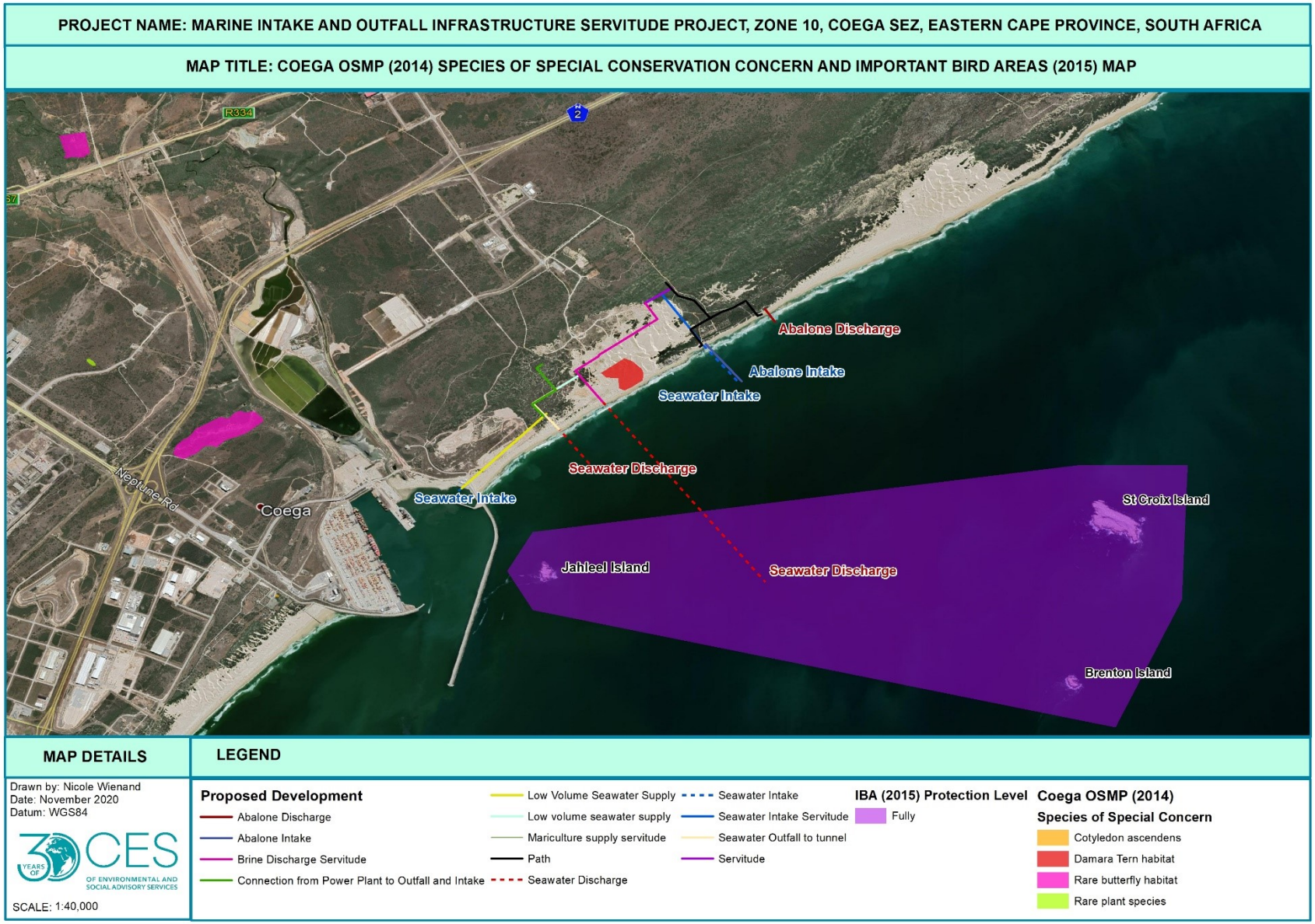


Figure 4.12: Important Bird Areas.

4.7 CONSERVATION AND PLANNING TOOLS

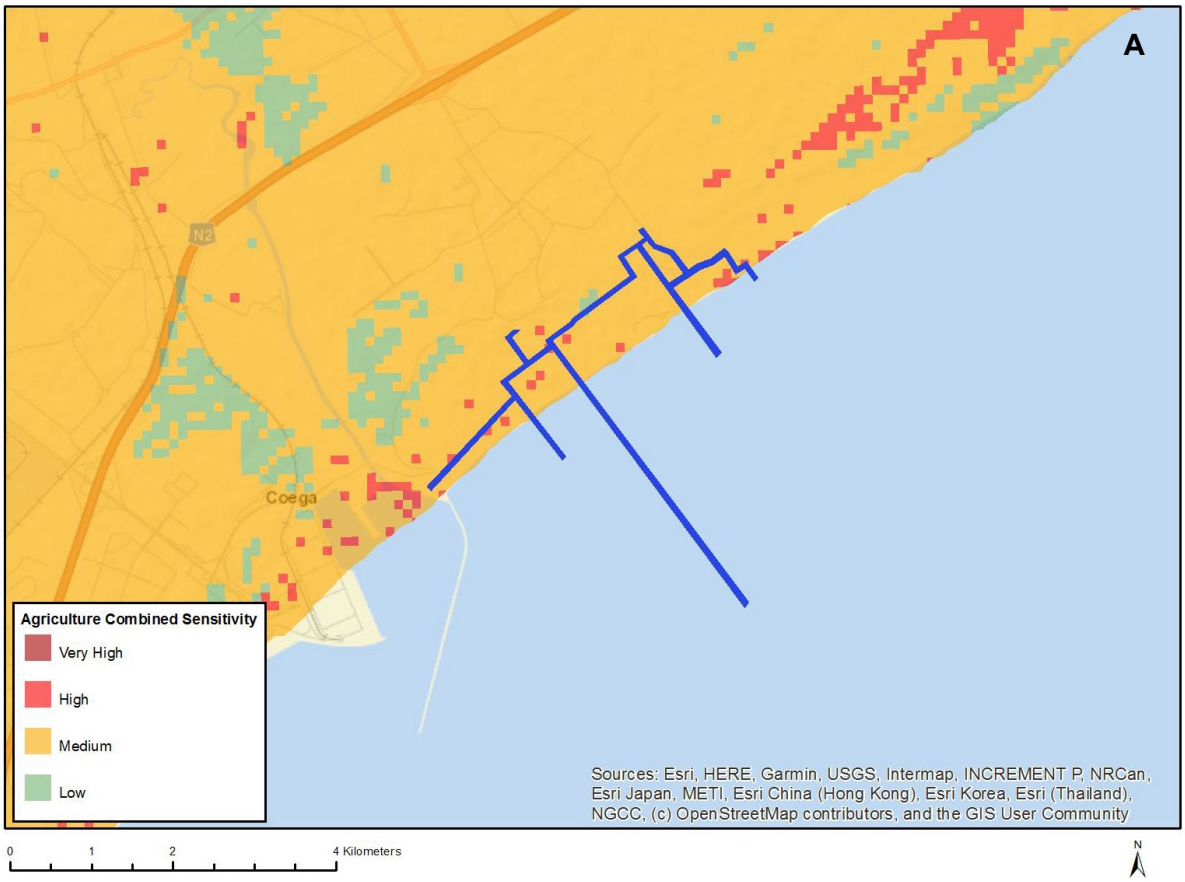
4.7.1 DEFF Screening Tool

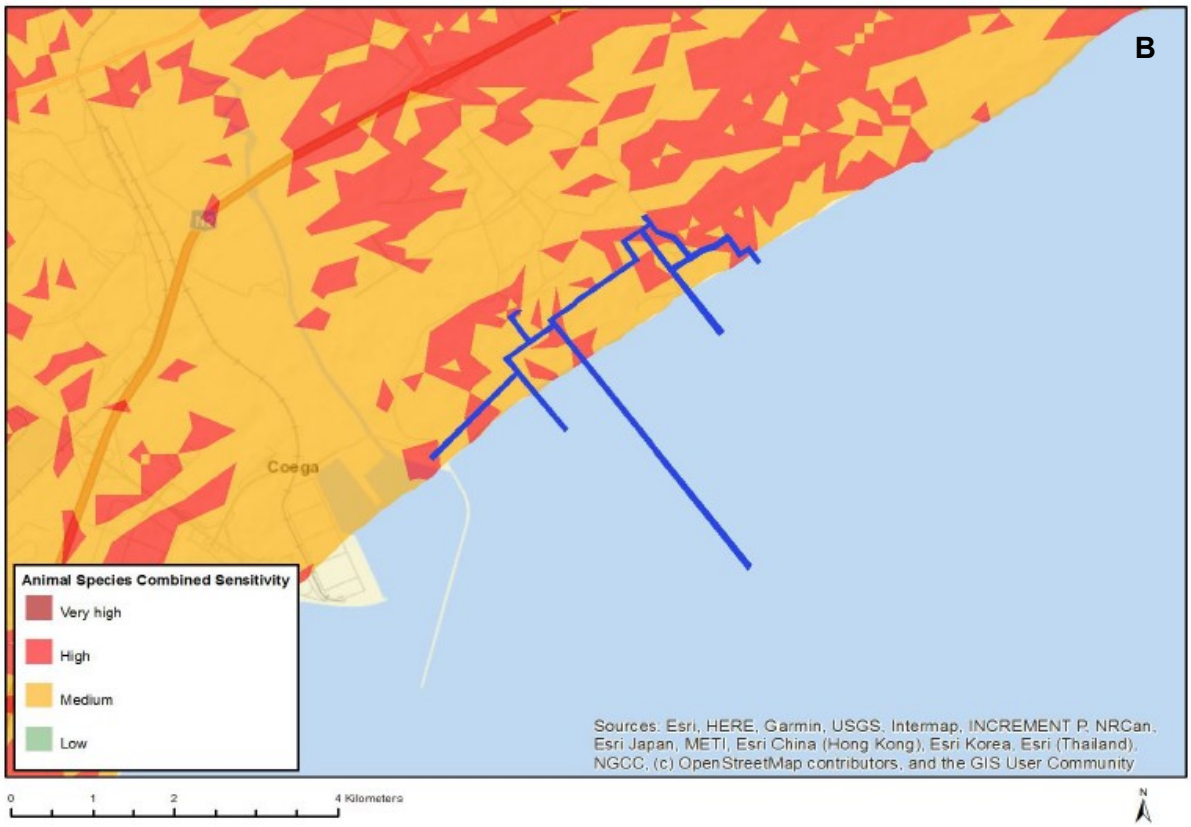
The table below provides a summary of the DEFF Screening Report of the proposed site, please refer to Appendix 4.1 for the full report.

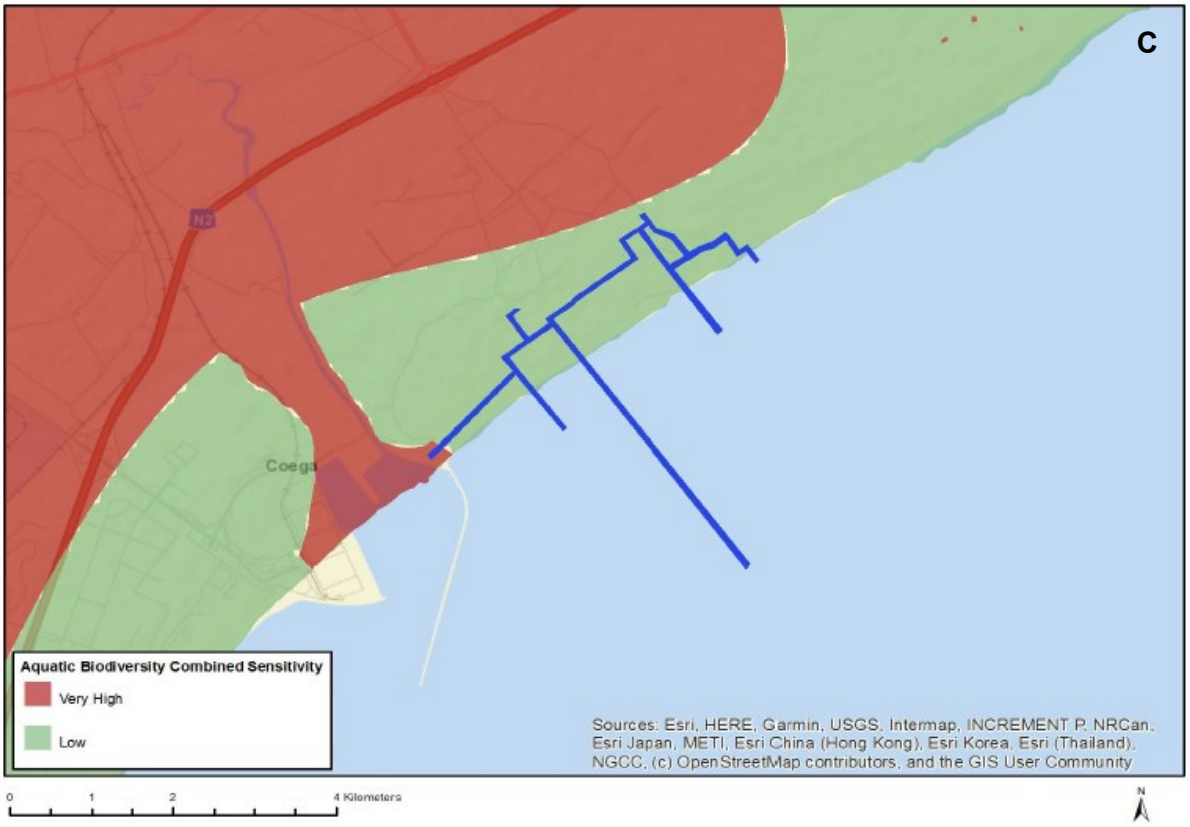
Table 4.5: Environmental sensitivities identified by the DEFF Screening Report and the proposed way forward.

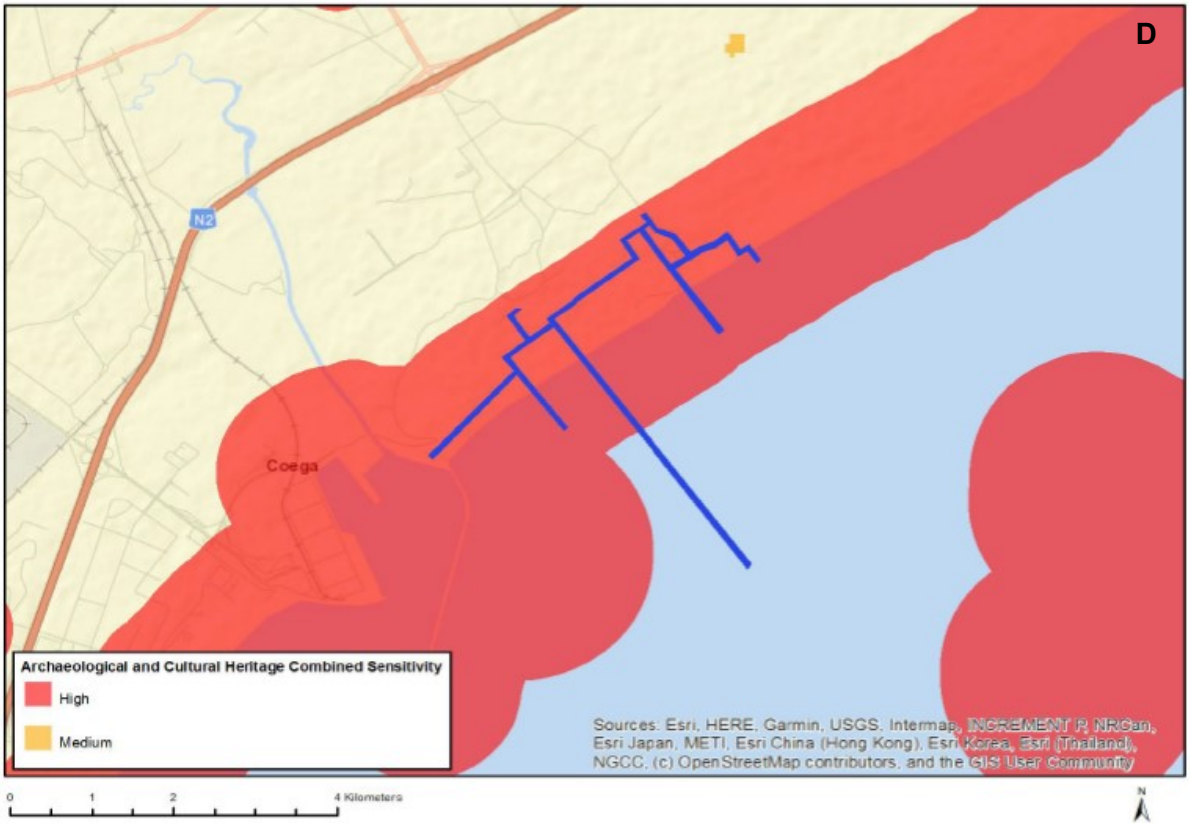
VARIABLE	SENSITIVITY	WAY FORWARD
Agriculture	High	The proposed development is within an established special economic zone and as such no agricultural assessment will be conducted for the proposed site.
Fauna	High	An ecological assessment will be conducted for the proposed development site.
Flora	Medium	An ecological assessment will be conducted for the proposed development site.
Terrestrial Biodiversity	Very High	An ecological assessment will be conducted for the proposed development site.
Aquatic Biodiversity	Very High	The presence of any wetlands within the proposed project areas will be confirmed with a site visit.
Archaeological and Cultural Heritage	High	An Archaeological, Palaeontological and Cultural Heritage Assessment was conducted for the SEZ in 2010. The CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. The CDC's Environmental Specifications for Construction include detailed requirements for the management of heritage in the SEZ, amongst others, the appointment of an archaeologist and palaeontologist during the construction phase of a project. These recommendations are included in the impact assessment included below and will be included in the EIA. It should be noted that we are aware that generally specialist studies should not be older than 5 years, however, heritage, archaeological and paleontological artefacts are sessile and thus the position of these do not change over time,

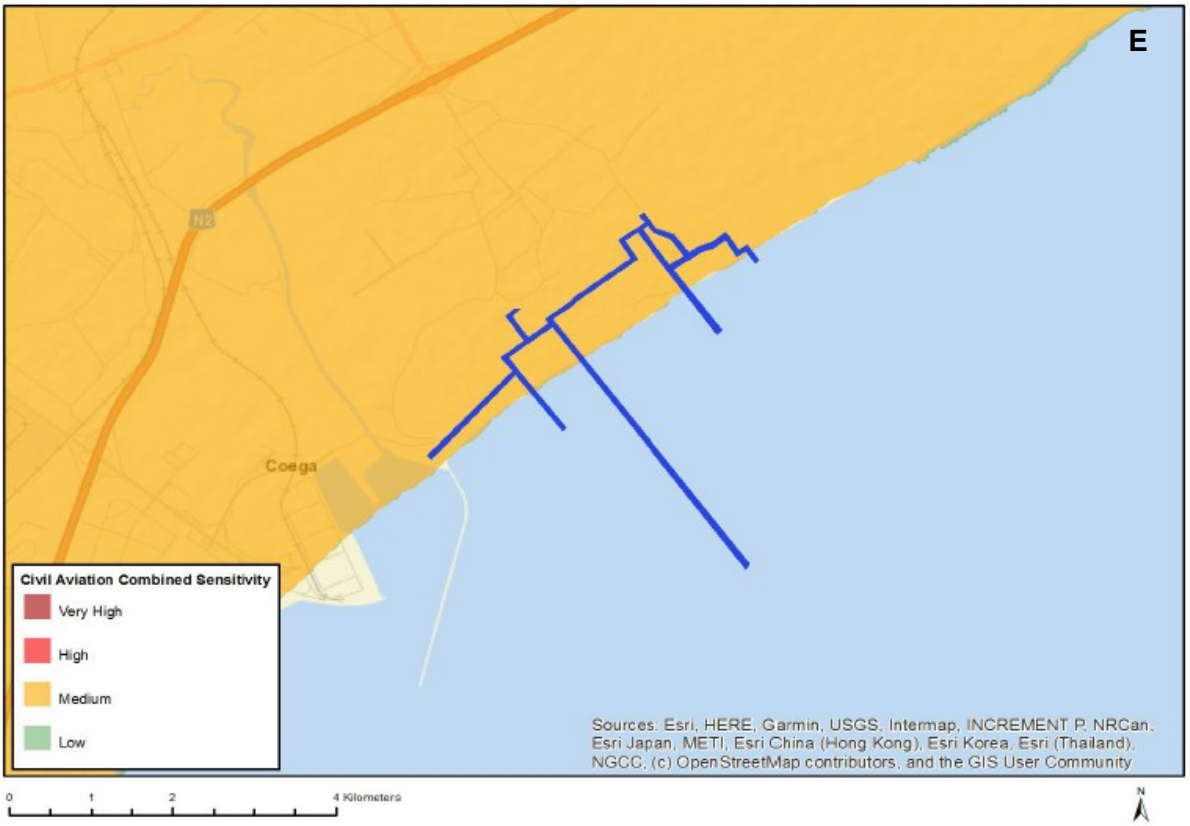
		as such it is considered acceptable to utilise the existing study as the status quo would not have changed.
Civil Aviation	Medium	None required
Defence Theme	Medium	None required

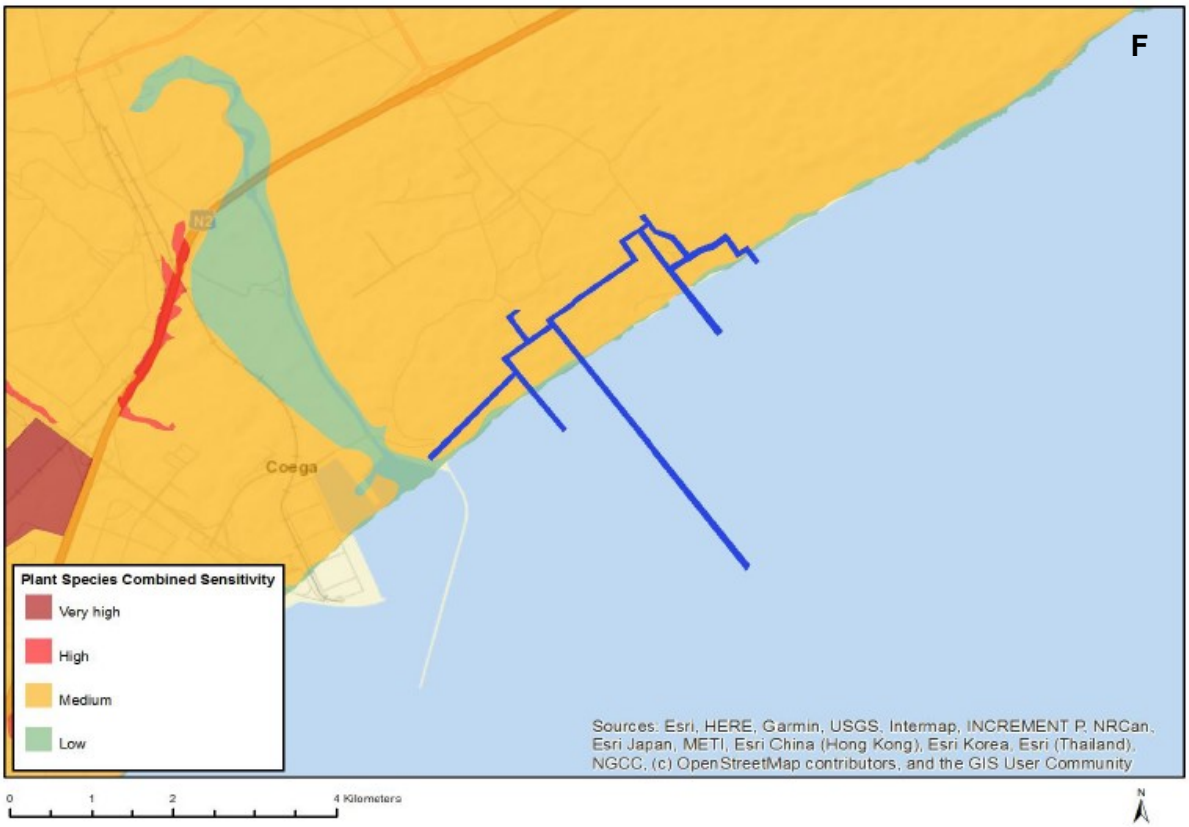


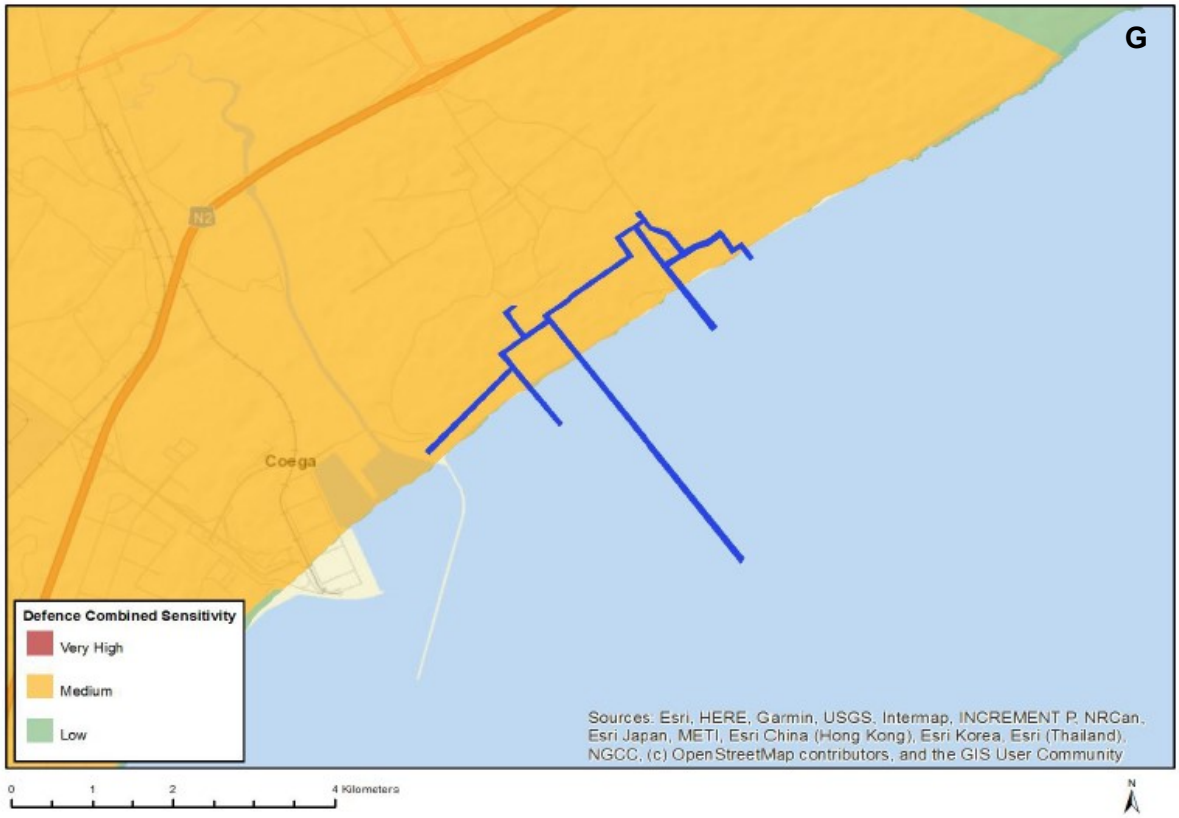

B
Coega
Animal Species Combined Sensitivity
Very high
High
Medium
Low
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
0 1 2 4 Kilometers
N


C
N2
Coega
Aquatic Biodiversity Combined Sensitivity
Very High
Low
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
0 1 2 4 Kilometers
N


D
N2
Coega
Archaeological and Cultural Heritage Combined Sensitivity
High
Medium
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
0 1 2 4 Kilometers
N


E
N2
Coega
Civil Aviation Combined Sensitivity
Very High
High
Medium
Low
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
0 1 2 4 Kilometers
N


F
N2
Coega
Plant Species Combined Sensitivity
Very high
High
Medium
Low
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
0 1 2 4 Kilometers
N


G
N2
Coega
Defence Combined Sensitivity
Very High
Medium
Low
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
0 1 2 4 Kilometers
N

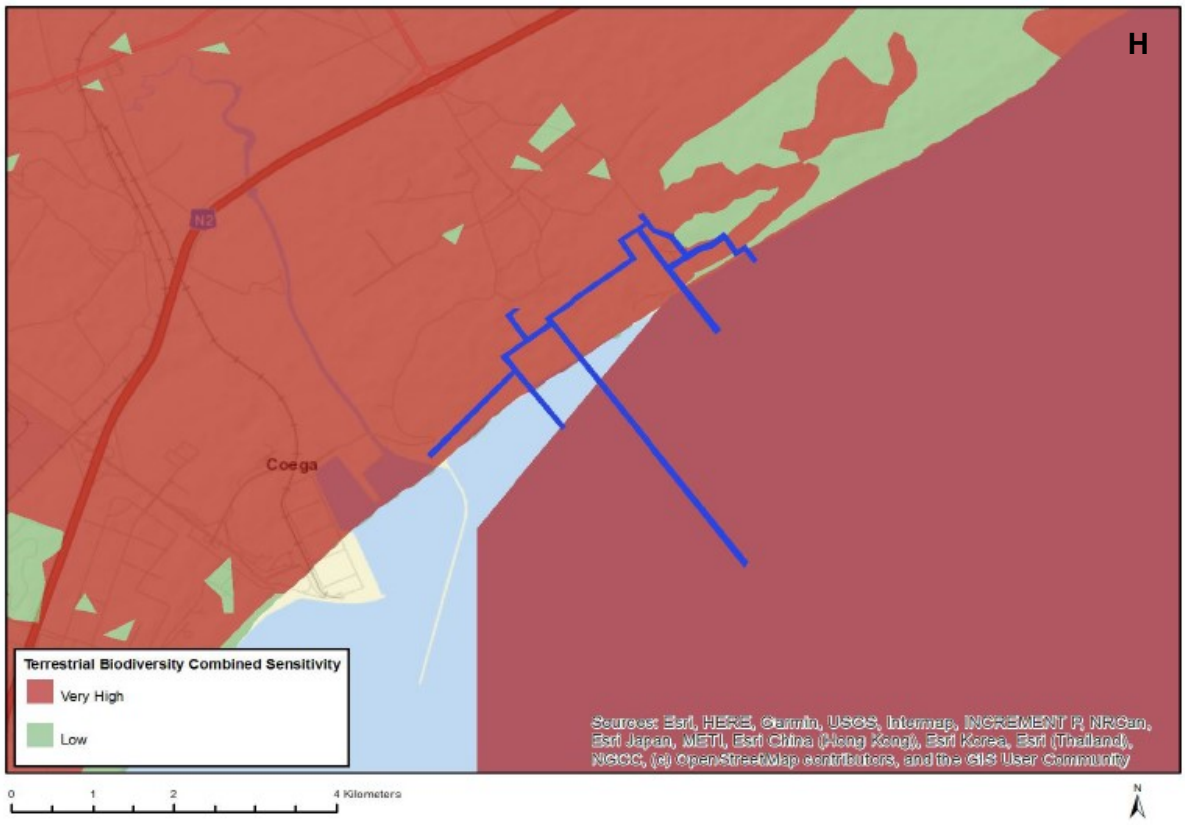


Figure 4.13: DEFF Screening Tool for (A) Agriculture (B) Fauna (C) Aquatic Biodiversity (D) Archaeology and Cultural Heritage (E) Civil Aviation (F) Flora (G) Defence Theme and (H) Terrestrial Biodiversity (please refer to the complete Screening Report in Appendix 4 of this report for higher quality maps.

4.7.2 Protected Areas

The marine component of the proposed development falls within the Addo Elephant National Park Marine Protected Area (Figure 4.14).

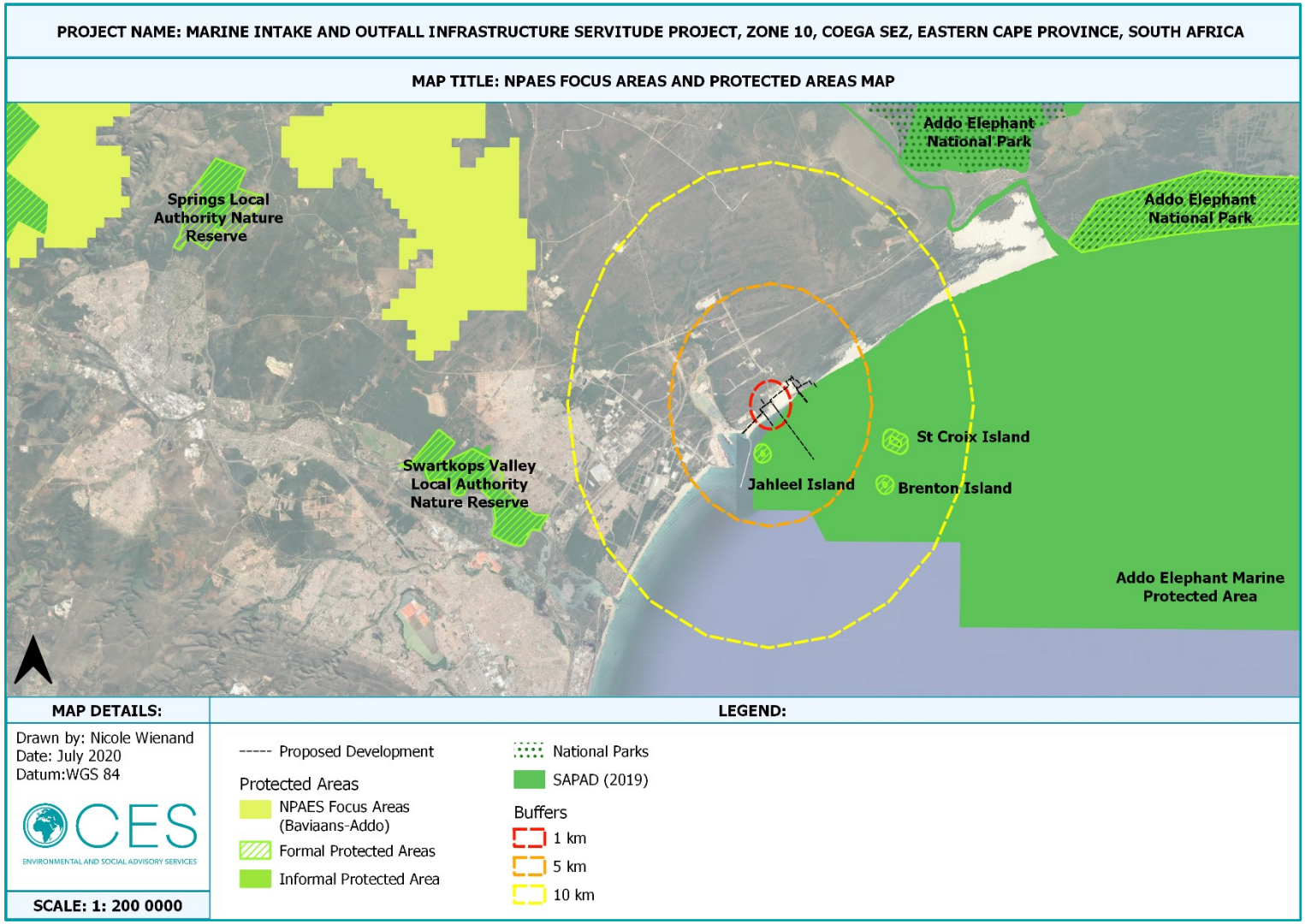


Figure 4.14: Map showing the project site in relation to the nearby protected areas and national protection Expansion Strategy (NPAES) areas.

4.8 MARINE ENVIRONMENT

4.8.1 Oceanography

The Agulhas Current is the dominant feature along this area of the coast and as such the waters off the coast of Algoa Bay are considered to be warm temperate, since the Agulhas current brings warm water from the tropics to the east coast. Average sea temperatures range from approximating 17-22°C (Schumann et al. 2005). Temperature fluctuations may occur along the Eastern Cape coast from time to time for a number of reasons, one of which is upwelling. Upwelling occurs when surface waters are deflected from the coast and thus colder water rises up in order to replace displaced surface water. Even though upwelling occurs to a greater extent and degree along the western coast, upwelling on the south coast is wind driven (usually as a result of Easterly winds), and has been responsible for fish kills, and water as cold as 6°C has been recorded in the area (Ross, 1988). These upwelling events are usually of short duration and as such harmful algal blooms seldom occur. In Algoa Bay, cold upwelled water usually originates from upwelling events at Cape Recife (Port Elizabeth) and Cape Padrone (near Cannon Rocks east of Coega) (Goschen et al. 2012). This is known to occur during periods when wind changes direction to that of westerly winds shortly after upwelling has occurred. According to Goschen and Schumann (1995), upwelled water moving into the bay has resulted in extremely sharp decreases in temperatures (up to 8ºC within 1 day). The dangerous Algal Bloom forming dinoflagellate, *Lingulodinium polyedrum* (previously recorded in the Port of Ngqura), is bioluminescent planktonic species which thrives in predominantly warm coastal waters. With increases in surface temperatures there is a higher likelihood of more frequent and extensive blooms along the coast of the Eastern Cape (SAEON, 2015). When surface temperatures exceed 22 degrees Celsius and nutrient rich bottom water plummets below 12 degrees Celsius, the sea conditions become optimal for bloom formations (SAEON, 2015). Therefore, with increases in temperatures, the frequency and duration of *Lingulodinium polyedrum* blooms are likely to increase.

The average (occurrence of 80% of the time) wave height within the bay is recorded to be less than 2 m. However, wave heights can reach in excess of 3 m during stormy conditions (maximum wave heights of 6 m have been recorded). It should, however, be noted that Algoa Bay is relatively protected against large swells mainly by the rocky headland at Cape Recife, Port Elizabeth (Goschen and Schumann, 2011).

4.8.2 Water Quality

Urban and industrial activities within Port Elizabeth, the Coega SEZ and the Port Elizabeth and Ngqura Harbours currently present a risk to water quality within the area. The main sources and non-point source pollutants described in the Algoa Bay Management Plan (CSIR, 1999) are as follows:

- Pollution (including stormwater run-off) from a number of activities within the catchment, including informal settlements, poorly functioning sewage treatment facilities, industrial effluent, untreated waste, etc.
- Ballast discharge from vessels;
- Oil spills from ships; and
- Litter and waste.

The Algoa Management Plan states that as a result of the above mentioned pollutants and due to the difficulty of sampling a large number of diffuse pollutant sources, a comprehensive monitoring programme is required for the area.

4.8.3 Marine Ecology

Birds

In 2005, the Bird Island group and St. Croix Island group both located in Algoa Bay were proclaimed as part of the Greater Addo Elephant National Park. In addition to this, these islands have been proclaimed as an Important Bird Area (No SA 095). According to BirdLife International both of the Algoa Bay Island groups are of considerable importance as they are the only islands along a 1,777 km stretch of coastline between Cape Agulhas and Inhaca Island in Mozambique. Fourteen seabirds, several shorebird and 33 terrestrial bird species have been recorded on the Algoa Bay Islands and eight seabird species currently breed there.

There are four globally threatened species, namely African Penguin **(**the largest colony in the world currently residing on the St Croix Island Group), Cape Cormorant, Cape Gannet and the African Black Oystercatcher, and two regionally threatened species, namely Caspian Tern (*Sterna)*, and Roseate Tern. The species reaching the 1% or more congregatory threshold[1] are Kelp Gull (*Larus dominicanus)* and Antarctic Tern, while Swift Tern (*Thalasseus bergii)* and Ruddy Turnstone (*Arenaria interpres)* are thought to reach the 0.5% or more congregatory threshold (BirdLife International). Jahleel Island, which is the closest island to the proposed project area (less than 1 km), forms part of the St Croix Island Group (Figure 4.13).

Fish

A total of 4,559 fish, representing 47 species and 27 different families, were caught within the Port of Ngqura between September 2006 and September 2007 during a study by ML Dicken. Catches included species characteristic of both estuarine and shore fisheries (Dicken, 2010). The majority (83.0%) of species caught were marine (with no dependence on estuarine systems) and most were less than size-at-50% maturity (71.4%). The most abundantly caught species were dusky kob (*Argyrosomus japonicas*) (25.5%), elf (*Pomatomus saltatrix*) (24.9%), garrick (*Lichia amia*) (17.7%) and dusky sharks (*Carcharhinus obscurus*) (10.7%) (Dicken, 2010).

The fish caught ranged in size from 5 cm Cape stumpnose (*Rhabdosargus holubi*) to 207 cm Raggedtooth shark (*Carcharias taurus*). The majority (71.4%) of species were considered to be juveniles rather than adults (Dicken, 2010), illustrating that the port is functioning as a nursery area for juvenile fish species.

Fish assemblages differed significantly between the three habitats identified within the port, namely: Dolosse, Quay Wall and Sandy Shore. The Dolosse habitat supported the greatest abundance and diversity of fish species (Dicken, 2010).

The 47 species of fish caught by anglers in the Port of Ngqura indicates a diverse ichthyofauna (Dicken, 2010). The high abundance and diversity within the port is likely to be due to the relatively calm and sheltered environment in comparison to the surrounding coastline (Dicken, 2010). The harbour provides a sheltered environment from predominant winds, providing conditions favourable for juvenile fish recruitment (Garcia-Charton and Perez-Ruzafa 2001). The port structures can create hydrodynamic conditions that promote the retention of planktonic larvae which may provide greater access to food for juvenile fish (Floerl and Inglis 2003 cited in Dicken, 2010). Furthermore, the Port of Ngqura also provides a hard substrata habitat very different to the soft sediment habitat typical of the surrounding sandy beach environments. Therefore, the port has the potential to alter the distribution, diversity and abundance of fish species in the coastal environment (Dicken, 2010). In the case of the Port of Ngqura, these alterations in environmental conditions have resulted in the port functioning as an important habitat for both juvenile and adult fish.

[1] This means 1% of the global population congregates in the area.

Mammals

The waters surrounding Southern Africa boast 40 different kinds of marine mammals. Between July and December of every year, the Eastern Cape coastline is frequented by Southern Right Whales (*Eubalanena australis*) and Humpback Whales (*Megaptera novaeangliae*), which promote an influx of marine based tourism activities. Other species of cetacea which are known to occur in the area include Indian Ocean bottlenose dolphins (*Tursiops aduncus*), longbeaked common dolphins (*Delphinus capensis*), Indo-Pacific humpback dolphins (*Sousa chinensis*), and Bryde's whales (*Balaenoptera brydei*) (Lubke & Moor, 1998; Reisinger and Karczmarski 2009, Melly 2011). Cape Fur Seals (*Arctocephalus pusillus*) are commonly seen resting ashore or found feeding in aggregations at sea (Lubke & Moor, 1998). Breeding occurs on Black Rocks in Algoa Bay (Mills and Hes, 1997).

Of these species, the Indo-Pacific humpback dolphin (*Sousa chinensis*) is listed as Near Threatened on the IUVN Red data list.

A study by Melly (2011) identified key habitats for various marine mammals and highlighted the significance of Algoa Bay as a breeding and nursery area for southern right whales, and as a potential nursing area and migration route for humpback whales. Key habitat area for southern right whales, humpback dolphins and bottlenose dolphins were identified between the Port of Port Elizabeth and Cape Recife, with key habitats identified along the coastal strip from east of the Sundays River mouth to Woody Cape. Distribution patterns of these species are likely to be correlated to prey distributions (Melly, 2011). Humpback dolphins were found to frequent shallower coastal waters at an average depth of 6.6m, while humpback whales, Brydes whales, and common dolphins were associated with deeper water (Melly, 2011).

Reefs

On intertidal reefs, red algae dominate particularly *Plocamium corallorhiza, P. Cornutum, Pterosiphonia cloiophylla, Hypnea spicifera, Chondrococcus hornemannii, Gigartina paxillata, Laurencia flexuosa* and articulated corallines *Amphiroa bowerbankii, A. ephedraea, Arthrocardia duthiae, Cheilosporum cultratum, Corallina* sp. and *Jania* sp. (Seagrief, 1988). Brown algae are also an important component, particularly species of *Dictyota* and *Dictyopteris, Zonaria subarticulata, Ecklonia biruncinata* and *Iyengaria stellata*. Green algae such as *Caulerpa filiformis, C. racemosa, Bryopsis* spp. and *Codium* spp. play a subordinate role to intertidal community composition (Seagrief, 1988). On intertidal and shallow subtidal reefs grazers and filter feeders are the most prolific fauna. In particular molluscs such as *Perna perna* and *Petella cochlear* and the *ascidian Pyura stolonifera* dominate the intratidal and shallow subtidal (Beckley, 1988). Deeper reefs are dominated by a high diversity of filter feeders, particularly colonial ascidians, sponges, soft corals and bryozoans (Porter *et al*., 2012).

The coastal area stretching from the eastern breakwater past the Sundays River Mouth has been established as a Marine Protected Area by SANParks.

Alien Invasive species

Ports are known to have a number of impacts on the marine environment, including the introduction of alien organisms through hull fouling of slow-moving vessels and transportation of ballast water containing alien species (Dicken, 2010). Invasive alien marine species can potentially threaten biodiversity, marine industries as well as human health, and can be exacerbated over time (Bax *et al.*, 2003). While some progress is taking place on the 10,000 species estimated to be in transit around the world in the ballast water, effective solutions are still a long way off (Bax *et al*., 2003).

In South Africa in 2005, 10 confirmed extant (still in existence or surviving) alien and 22 cryptogenic (introduced species obscure or uncertain origin) species were recorded (Robinson *et al*., 2005), the majority of which are restricted to harbours. However, management action against invasive species is extremely difficult, especially once a species has become established (UNEP Regional Seas Programme, 2014).

4.8.4 Port and Other Industrial Activities

The Coega SEZ was established in 1999 and is adjacent to the modern deep-water port of Ngqura. The SEZ consists of approximately 11,500 ha and has been divided into 14 zones based on the various land uses within the SEZ. The SEZ is designed and zoned for heavy, medium and light industries as well as the construction of factories, warehouses and office complexes. Existing companies operating within the SEZ form part of various sectors including logistics and infrastructure (road, rail, and marine transport), telecommunications and a variety of industries. The SEZ is developed and managed by the Coega Development Corporation (CDC) which looks to initiate local and foreign direct investments in export-oriented industries.

4.9 SOCIAL AND ECONOMIC

4.9.1 Administrative Structure

The project is located within the Nelson Mandela Bay Municipality (NMBM) within the Sarah Baartman District Municipality (formerly the Cacadu District Municipality) of the Eastern Cape Province. The NMBM is divided into several Wards which are the political responsibility of separate councillors. The project falls into Ward 53 and borders Ward 60 (Figure 4.15). The Coega SEZ is located within these wards and falls under the stewardship of the Coega Development Corporation (CDC). The administration of the Port of Ngqura falls under the Transnet National Ports Authority (TNPA).

4.9.2 Demographic Profile

According to StatsSA (2011c) the municipality had a total population of 1,152 114 in 2011, constituting approximately 60.1% black residents, 23.6% coloured, 14.4% white and 1.9% Indian/Asian residents. Of importance to note is that these numbers indicate an evident growth of the metropolitan's population over the last decade. In 2001 the population of the municipality stood at 1,005,779. This indicates a growth rate of 1.36% (StatsSA, 2011b). However, in relation to other metropolitan areas in the country this is a relatively slow growth rate. For example, the growth rate between 2001 and 2011 in Johannesburg was recorded at 3.18% (*ibid*). The youth comprises a substantial portion of the population. Approximately 35% of the metro are below the age of 20 years. More specifically, 25.5% are between the ages of 0 to 14, whilst 68.5% of the population are between the working ages of 15 and 64 (*ibid.*).

With 588 persons per km^2 the population density of the municipality is less than other cities, such as Johannesburg (estimated at 2,696 persons/km^2). There are 324,292 households in the municipality, with an average household size of 3.4 members (StatsSA, 2011b). In terms of gender, the male-to-female ratio can be calculated at 1:1.08, which indicates slightly more females.

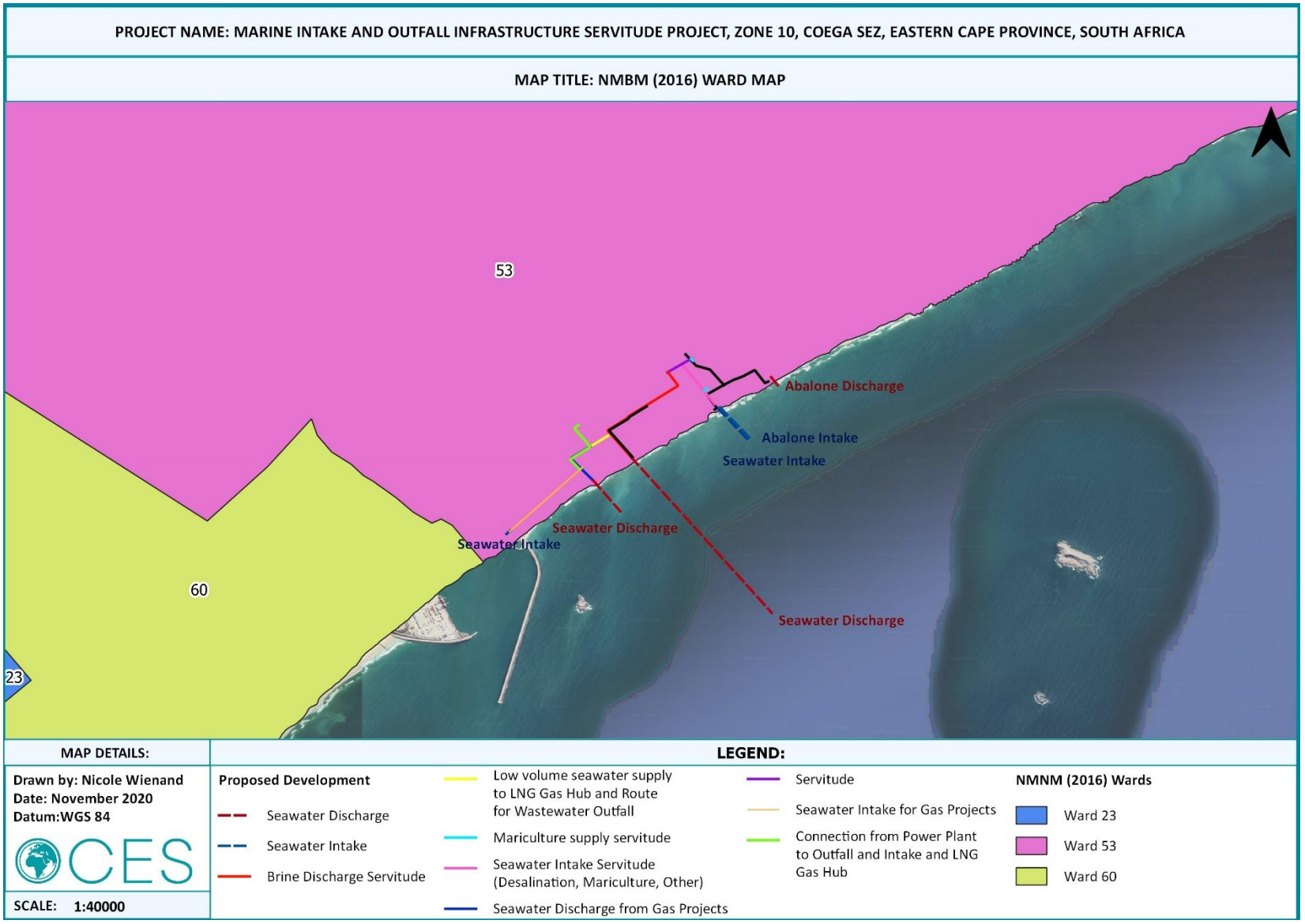


Figure 4.15: Ward Map of the proposed project area. The project area only falls into Ward 53 and borders Ward 60.

4.9.3 Education

Access to education in the Metro is illustrated in Table 4.5 below in terms of the various education levels and categories. Altogether 3% of residents have no schooling, 13% have Grade 7 or lower (primary school level) and 75% have between Grades 8 and 12 (secondary school level). These figures exclude the current population of pre-school and school-going age; i.e. 0-19 years (2011 Census). Factors contributing to low education levels could include poverty and other social challenges, forcing the Municipality to look at strategies, along with other sectors of government and the private sector, aimed at promoting education from early learning development up to tertiary levels (NMBM IDP, 2015).

Table 4.6: Education statistics for the Nelson Mandela Bay Metropolitan Municipality (from StatsSA, 2011).

Institution	Male	Female	Grand Total
Pre-school, including day care; crèche; Grade R and Pre-Grade R in an ECD centre	1177	1149	2325
Ordinary school including Grade R learners who attend a formal school; Grade 1 - 12 learners & learners in a special class	122286	119546	241832
Special schools	1087	832	1919
Further Education and Training Colleges (FET)	4663	5527	10190
Other Colleges	1824	2511	4335
Higher Educational Institution University/University of Technology	11813	13691	25504
Adult Basic Education and Training Centres (ABET Centres)	1564	1995	3559
Literacy classes e.g. Kha Ri Gude; SANLI	277	395	672
Home-based education/ Home schooling	590	554	1143
Not applicable	407713	452922	860636
Grand Total	552994	599121	1152115

Source: StatsSA Census 2011

4.9.4 Health

According to the 2011 Statistics in the Eastern Cape Department of Health (ECDOH) Annual Report 2012/2013 the life expectancy of people living in the Eastern Cape is 59.3 years for females and 53.7 years for males. 6.1% of the population is classified as disabled and only 11.1% of people have medical aid coverage. There are 213 nurses and 28 medical practitioners per 100,000 people in the Eastern Cape (ECDOH, 2013).

According to StatsSA (2013) the leading cause of death in the Eastern Cape is *Mycobacterium tuberculosis* (TB) which accounted for 12.7% of deaths in 2010. The other leading underlying causes of Eastern Cape deaths were influenza, pneumonia, heart disease, chronic lower respiratory diseases, cerebrovascular diseases, intestinal infectious diseases, diabetes, HIV, hypertensive diseases and other viral diseases (Figure 4.16). In the Nelson Mandela Bay Municipality, the cure rate for TB is 69.4% in comparison to the province cure rate of 68.9%. TB is also the leading cause for admission in Eastern Cape hospitals according to 2004 statistics

presented by Buso *et al*, and is followed by diarrhoeal disease, pneumonia and HIV (ECDOH, 2013). The number of people living with HIV in Nelson Mandela Bay has begun to decline. Within Nelson Mandela Bay strides have been made to ensure that the spread of HIV/AIDS is reduced and treatment is made available.

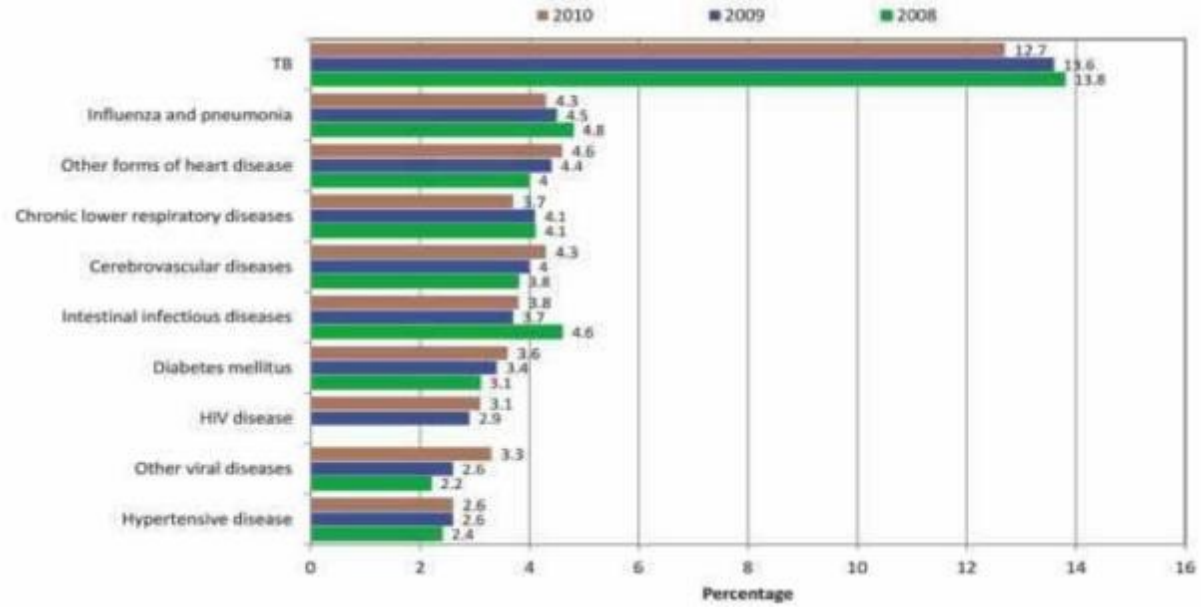


Figure 4.16: Ten leading underlying natural causes of deaths in the Eastern Cape Province from 2008 until 2010 (from StatsSA, 2013 in ECDOH Annual Report, 2013).

The infant mortality rate has been used as a measure of population health (ECDOH Annual Report, 2013). It remains an important indicator reflecting the notion that structural factors affecting the health of the entire population have an impact on the mortality rate of infants. According to StatsSA's 2013 statistics the leading cause of death in Eastern Cape children (aged 0 to 14 years old) is intestinal infectious diseases, which accounts for 15.3 % of these deaths (Figure 4.17). Infant mortality rates declined for the 2007 to 2011 period.

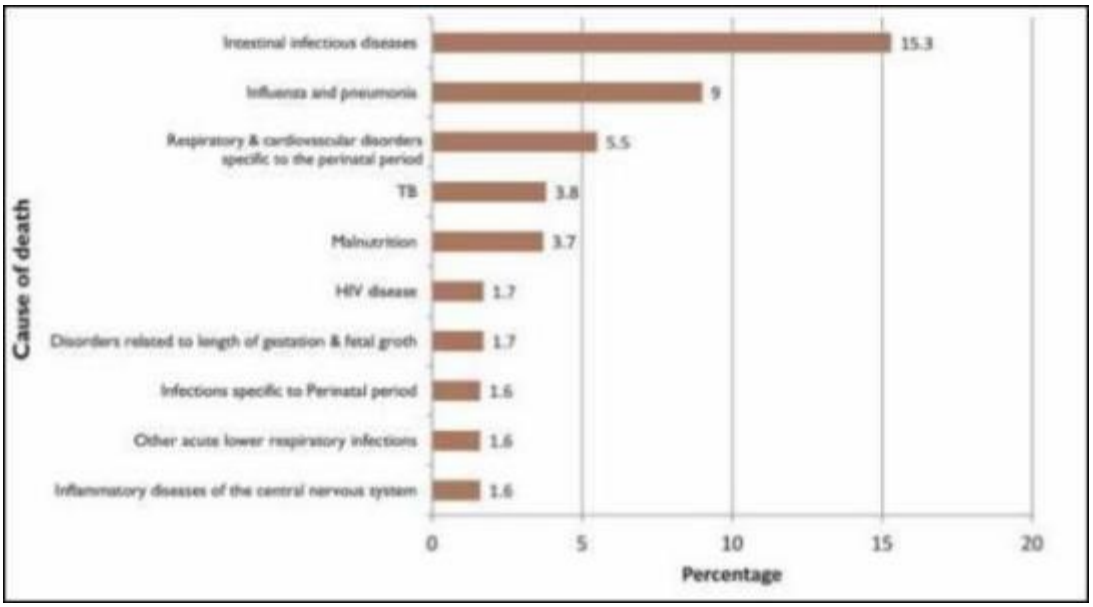


Figure 4.17: Ten leading causes of deaths to Eastern Cape children (0 to 14 years of age) (from StatsSA, 2013 in ECDOH Annual Report, 2013).

4.9.5 Economic Profile

Although the municipality is known for its industrial character and manufacturing sector, high levels of unemployment seems to be a prevailing issue in the metropolitan area. Data presented by the NMBM Municipality IDP (2011-2016) states that official unemployment rate is 28.2% (NMBM, 2011-2016), while StatsSA (2011c) estimates this rate at 36.6%. This might be explained by the fact that the Metropole has a recorded number of 22,411 informal households and 49,000 backyard shacks (*ibid.).* According to de Wit (2012), industrial development in the NMBM area faced several inhibiting effects in the recent global economic recession, which included the national energy deficit.

The municipality's Gross Domestic Product (GDP) growth rate was around 2.1% in 2010, and the average income per capita was estimated to be R52,147 (StatsSA, 2011b). According to the South African Local Economic Development (LED) Network (2015) the metro contributes approximately 44% to the regional GDP for the Eastern Cape Province (SA LED Network, 2015). The largest economic sectors in the metro area are manufacturing, finance, community services and transport. Manufacturing contributes 33% to the metro's GDP (ibid.). Community services, trade and the manufacturing sectors are the sectors that create the most employment in the metro.

The region's economic centres include the nodes of Port Elizabeth, Uitenhage, Despatch and the Coega SEZ and Port of Ngqura. From an economic perspective the Coega SEZ has been very successful in attracting large-scale investments to the metropolitan area. The SEZ has been designed primarily to cater for the area's manufacturing sector, as well as to stimulate socio-economic development, skills development and job creation.

Aligned with the South African economic development agendas, the NMBM has set in motion several strategies specifically aimed at rural development and social service delivery. One of these includes the Municipality's Turnaround Strategy of 2009, which specifically addresses the metropolitan's poverty and LED. This strategy aims to develop a shared agenda for growth which connects households to basic social services. Another strategy includes the municipality's Provincial Growth and Development Plan (PGDP), which attempts specifically to fight poverty and provide basic social services and infrastructural development. The municipality is also developing the Coega SEZ in alignment with the Government's National Spatial Development Perspective (NSDP), which promotes economic development.

The NMBM's IDP identifies several ward priorities which could be addressed through economic development. Some of these could assist with integrating human settlements with adequate provision of water, sanitation and electricity. The need to prevent water leakages and electricity disruptions have also been identified as ward priority areas, together with the need to stimulate rural economies and to develop the youth, women and the disabled.

The NMBM LED strategies are aligned to the national priority areas of the Government of South Africa (GoSA). These are all framed by various guidelines and targets, such as the Government's National Industrial Policy Framework (2012-2015), or the National Development Plan (NDP) (of Vision 2030), released on 11 November 2011 (*cf.* GoSA, 2011). One of several aims of the NDP is to create 11 million employment opportunities and to grow the economy at a steady rate of around 5.4% per annum by 2030. Most of these strategies are based upon particular Key Performance Indicators (KPIs), such as improved service delivery and infrastructural investment, but also sustainable LED (such as the creation of employment opportunities) and social development.

The NMBM's IDP and the Metropolitan Spatial Development Framework (MSDF) outline a number of strategic development areas which the metro is committed to achieve (NMBM, 2011-2016). The framework supports any development which could enhance urban development, with

a key focus on infrastructural development. According to the IDP, some of the metro's development priorities include the development and maintenance of infrastructure for economic development, and access to social services and amenities, especially to disadvantaged communities. The latter is the first mentioned IDP performance area, whereas LED is the second. Job creation, poverty alleviation and the development of the youth, women and disabled are all priority areas under the IDP and MSDF. What should not be overlooked is the importance of providing adequate housing for growing informal settlements, with a housing backlog of 71,411 (*ibid.*).

The average household annual income ranges between R19,601 and R76,400 (approximately R1,633 to R6,366/month) (StatsSA, 2011c). This data is presented in Table 4.7 below. Compared to the international poverty line of US$1.25 per day (R8.48 or R169.6 per month, as re-figured by the World Bank in 2005), this is well-above the acceptable international poverty threshold. Although this is the case, 42% of households earn less than R19,601 annually (R1,633/month), whereas 16% earn no income. However, it should be noted that, according to StatsSA, the average household annual income per annum increased to approximately R51,698 between 2001 and 2011.

Table 4.7: Income brackets*.

Income Ranges	Percentage
No income	16%
R1-R4,800	4%
R4801-R19600	22%
R19601-R76400	30%
R76401-R307600	20%
R307601-R2457600	7.7%
R2457601 >	0.30%

**Source: StatsSA, 2011c.*

4.9.6 Land Use

According to the NMB MOSS (2009) land use zones, the proposed project area falls within Urban formal, Donut and High density alien plant zones (FIGURE). The proposed project area is located within Zone 8 (Port of Ngqura) and Zone 10 of the Coega SEZ. The zones are defined by the Coega Open Space Management Plan of 2014. Zone 8 is the 'Port of Ngqura including the harbour breakwaters, harbour terminals, container yard and surrounding infrastructure. Zone 10 is the 'Mariculture & Aquaculture Cluster' referring to activities pertaining to the marine environment.

4.9.7 Cultural Heritage[2]

A Phase 1 Archaeological Impact Assessment was undertaken for the Coega SEZ (previously referred to as the Coega IDZ) by Dr Johan Binneman in 2010. The section below is as per the findings of the 2010 study.

"*Most of the more than 9 200 hectares of the Coega SEZ is covered by dense low and high grass and impenetrable thicket vegetation, which made it difficult to find archaeological sites/materials. Although most of the inland areas of this large property (the inland zones) are relatively undeveloped, it has been disturbed in the past by small scale farming activities, and more recently by power line and road construction. In a few of the zones large areas have been cleared of vegetation and large-scale developments have taken place. These cleared areas provided*

[2] 1. Source: Phase 1 Archaeological Impact Assessment undertaken for the IDZ (Binneman, 2010))

windows to search for archaeological sites and materials which were not possible due to the dense vegetation.

Although the area/zones investigated were occupied extensively in the past (judging from the large quantity of flaked stone randomly scattered throughout the area), it would appear that the area is relatively poor in large and important archaeological sites. However, many sites/materials and human remains may be covered by soil and vegetation. These may only be exposed when development takes place, as is evident in Zone 7 where archaeological remains were exposed when an area was cleared by bulldozers for the construction of a road.

The most important archaeological sites were found along the coast (on TNPA property) and included mainly shell middens which date from the past ca 8-6 000 years. Similar sites in the shifting sand dunes and coast east of the harbour area were much smaller in size, in terms of depth of deposit, quality and quantity of food waste and cultural material. These archaeological features are usually found between two to five kilometres inland from the coast".

The CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. The CDC's Environmental Specifications for Construction include detailed requirements for the management of heritage in the SEZ, amongst others, the appointment of an archaeologist and palaeontologist during the construction phase of a project. These recommendations are included in the impact assessment included below and will be included in the EIA.

4.9.8 General Infrastructure and Services

According to StatsSA (2011c) 100% of the metropolitan's households have access to the national electricity grid, although 12% of the households situated in un-demarcated informal areas do not have such access. Concerning sanitation services, on the other hand, the metro seems to have the highest percentage of households with access to flush/chemical toilets compared to other district municipalities in the Eastern Cape. Over 90% of households have access to proper sanitation services, whereas 99.68% of households have basic refuse collection. In terms of water access 100% of the households have access to a water point at least within a 200 m radius. Approximately 74.1% of households have piped water inside their house; all formal households have direct water connections.

4.9.9 Noise

The proposed maximum permissible noise rating levels are based on national and international recommendations and guidelines. Most codes of practice and legislation relating to environmental noise incorporate the desired activity and time of day as part of the process that assesses and controls noise. In South Africa, the procedures for the measurement, assessment and control of environmental noise are contained in the Noise Control Regulations of the Environment Conservation Act 73 of 1989 and the SABS Code of Practice 10103:2008 for "*The measurement and assessment of environmental noise with respect to annoyance and speech communication*".

Even though the proposed development is within an established industrial zone care must be taken in regards to increased noise levels, especially in close proximity to the MPA.

4.9.10 Visual

The proposed development site is within an established industrial zone and thus the proposed development is not anticipated to impact significantly on sensitive visual receptors. In addition, the CDC has developed detailed Architectural and Landscape Design Guidelines, which needs to be adhered to by all developers. These guidelines "*seek to achieve an attractive development*

of distinction without impinging on the creativity of designers or detracting from the corporate identity of individual developers and tenants. An overall integrity of the development is sought which adds address-value and appreciated property values to each development within the Coega SEZ." In addition to this, the Port of Ngqura also has a set of lighting guidelines for the Port in order to limit the overall impact on Jahleel Island. These will be incorporated into both the EIR and the EMPr.

5. THE EIA PROCESS

5.1 INTRODUCTION

In terms of the South African Environmental Legislative Framework, this project will be subject to the Environmental Authorisation process, which was updated on the 4th of December 2014, and now also includes 2017 amendments. Based on the scope of work, this project requires an Environmental Authorisation in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998) and the EIA Regulations of 2014 (with subsequent 2017 amendments), and the process triggered is a Scoping and Environmental Impact Assessment. All the phases, including the Environmental Management Programme report (EMPr), will be prepared in terms of the NEMA EIA Regulations and its amended GN Regulation 982 and the associated listed activities under regulation GN 983, GN 984 and GN 985 (as amended).

5.2 APPROACH TO PROCESS

The EIA process is initiated by the Scoping Phase, which includes a Scoping Phase Public Participation Process (PPP). During the Scoping Phase, the Terms of Reference (ToR) for the full EIR are formulated, and requirements from the authorities are clarified. The Scoping Phase serves to bring stakeholders on board by consulting with relevant government departments and other key stakeholders to identify potential issues and concerns.

After completion of the Scoping Phase, detailed specialist studies are undertaken in order to address the issues identified during the Scoping Phase. All draft reports are submitted for public review, and the key findings are presented to Registered Interested and/or Affected Parties (I&APs) at the provincial and local levels during public meetings or open days. Further details are provided in Section 5.6 below. All comments made by I&APs are captured in an Issues and Response Trail (IRT), and responses will be provided to all issues and concerns raised during the public review period.

All recommendations presented in the EIR and specialist reports must be detailed in an EMPr, which defines the actions required to be implemented during the phases of development. EMPrs are recognised as very important tools for the sound environmental management of projects.

5.3 SCOPING PHASE

The Scoping Phase is outlined in GNR. 982, NEMA EIA Regulations (2014 and subsequent 2017 amendments) under Part 3, section 21 as well as Appendix 2. The process to be followed is outlined in the sections below.

5.3.1 Desktop Review

All aspects of the proposed project are first analysed using a high-level desktop study which looks at the basic description of the project and what the initial environmental and social concerns may be. This includes background information for the project area as well as the proposed activity, details of the activities applied for according to the EIA Regulations (the listed activities) and the type of assessment which will be required. The desktop review involves the analysis of existing spatial data and the interpretation of maps covering the proposed project area, as well as available reports and planning instruments in order to familiarise the project team with the area and the various physical and biological properties of the area. The desktop review also identifies if the project requires any additional licences in terms of water use, waste, land use or any other environmental requirements.

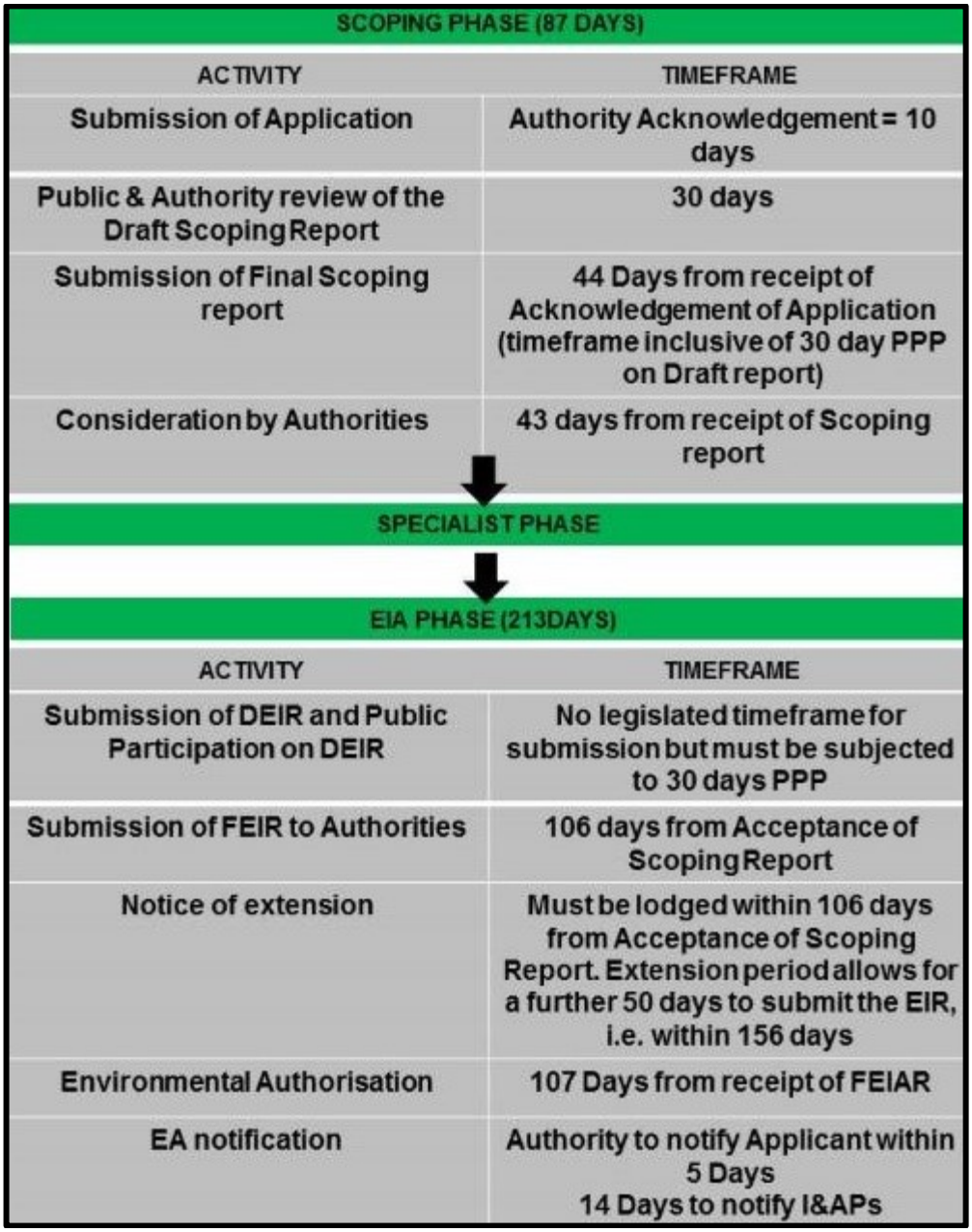


Figure 5.1: EIA Process

5.3.2 Submission of Application Form

An application for environmental authorisation has been submitted to the Competent Authority as per the requirements of Section 16 of the EIA Regulations.

5.3.3 Scoping Report

Draft Scoping Report

The information gathered through the initial (pre-application) PPP phase, as well as the information from the site visit and from the client with regard to the design of the project was integrated into the Draft Scoping Report. In addition to identifying issues, this report also provides:

- A preliminary assessment of the impacts of these issues based on current information

(Chapter 6).
- An overview of the project in relation to South African legislation and relevant guidelines (Chapter 3).
- Terms of Reference (ToR) for the EIA Phase, identifying the issues that need to be addressed in the EIR (Chapter 7).

This Draft Scoping Report was made available to the public for a period of 30 days for comment. I&APs were informed of the release of the Draft Scoping Report via e-mail and sms', as well as an advertisement in The Herald. Soft copies of the report was made available in the following publicly accessible places:

- The local ward councillors' office,
- Posted electronically on CES's website.
- Posted electronically on the CDC's website.

Final Scoping Report

The comments, issues and concerns raised by I&APs and the authorities during the review period of the Scoping Phase have been included into the Final Scoping Report in the form of an Issues and Response Trail (Section 5.6.4).

The Final Scoping Report (this report) will be submitted to the Competent Authority, who will decide whether the main phase of the EIA can be initiated. The Competent Authority will also approve, with or without amendments, the Terms of Reference for the proposed specialist studies, and the Plan of Study for the EIA phase of the assessment, which is presented in Chapter 7 of this report.

5.4 SPECIALIST STUDY PHASE

In order to assess the environmental and social impacts associated with the proposed project, a number of specialist studies will be undertaken as part of the EIA. These studies will cover issues identified at this stage, but additional issues may be identified or additional studies may be requested by the authorities following the Scoping Phase. More details can be found in Section 7.3 of the Plan of Study (Chapter 7).

The objectives of the specialist studies are as follows (full terms of reference for each of the specialist studies are available in Chapter 7, Section 7.3):
- Assist in defining possible constraints associated with the proposed project;
- Determine the potential environmental and social indirect, direct and cumulative risks/impacts to receptors; and
- Advise on mitigation measures for identified significant risks/impacts and measures to enhance positive opportunities of the project.

5.5 INTEGRATION AND ASSESSMENT PHASE

Specialist input forms an important component of the EIA process, and the results of these studies will be incorporated into the Draft EIR. This report will consist of an introductory section, a detailed project description, sections in which the results of all specialist reports are summarised, and an environmental impact section, where impacts will be assessed and rated according to a predefined rating scale. Measures to mitigate negative impacts as proposed by the specialist consultants will also presented. The primary objective is to prepare a report that is scientifically credible but also understandable, with enough detail to deal with all the issues but not too much detail to overcomplicate the report and confuse I&APs.

The EIA process reporting requirements will include the development of a detailed EMPr, which is submitted as a separate report appended to the EIR. The EMPr contains the mitigation measures and monitoring guidelines required to manage and mitigate the impacts identified during the EIA process, for the construction, operational and closure/ decommissioning phases of the development. These mitigation measures presented aim to enhance the potential benefits and minimize the potential negative impacts of the project. The EMPr will specify responsibilities for the implementation of the programme, for monitoring the effectiveness of the mitigation measures and specify the periodicity of the audits to be carried out.

The Draft EIR, EMPr and specialist reports will be made available for public review for a period of thirty (30) days, in accordance with the legislated requirements. The availability of the Draft EIAR and supplementary documents will be advertised in the same manner as described for the Scoping Report.

Once the Draft EIR and supplementary documents have been amended to reflect public comments, the deliverables from the entire EIA Process – the Final EIR, the Final EMPr and a final set of Specialist Reports will be prepared. These reports will incorporate, where necessary, the comments, issues and concerns raised by Registered I&APs and Stakeholders, all of which are provided in an updated IRT. The final EIR, the final Specialist Report Volume and final EMPr will be submitted to the Competent Authority for decision making purposes.

5.5.1 Proposed Timeframe for the EIA

The EIA Process is expected to be completed by April 2021, with completion being defined as the submission of all final reports to the Competent Authority.

The Draft Scoping Report was completed in November 2020. Specialist studies will be undertaken upon approval of the Final Scoping Report, and hence the Specialist Assessment phase will be completed by February 2021.

The mandatory thirty (30) day public review period on the Draft Scoping Report ran from the 13th of November to the 14th of December 2020, after which the Final Scoping Report will be submitted to the Competent Authority (by the 15th of January 2021), who must within forty-three (43) days of receipt of the Final Scoping Report either accept or reject it. It is thus anticipated that the decision on the Final Scoping Report will be issued by the 27th of February 2021.

The Draft EIR is anticipated to be circulated for the mandatory thirty (30) day public review period, from the 1st of March to the 30th of March 2021, after which the Final EIR will be submitted to the Competent Authority for a decision. They have 107 days from receipt of all the Final EIR to either grant or refuse authorisation.

5.6 PUBLIC PARTICIPATION DURING INITIATION AND SCOPING

5.6.1 Objectives of Public Participation

Public Participation aims to:

- Disclose activities planned by the project proponent.
- Introduce the EIA team.
- Identify concerns and grievances from interested and affected parties.
- Harness local expertise, needs and knowledge from the interested and affected parties.
- Respond to grievances and enquiries from I&APs.
- Identify additional or new stakeholders and people affected by, or interested in, the proposed project.

- Gather perceptions and comments on the proposed terms of reference for the specialist studies.
- Ensure that all issues raised by I&APs have, or will be, adequately assessed.
- Share the findings of the EIR and specialists' studies.
- Include any new concerns or comments that arise.

This information is used to:

- Identify underestimated or unanticipated impacts.
- Alert the project to possible communication breakdowns and emerging problems and concerns.
- Encourage the use of local resources and knowledge in the project.
- Identify development opportunities and community projects.
- Ensure that all issues and concerns raised during scoping and in subsequent engagements are dealt with adequately in the EIA process. This is achieved through the preparation of an Issues and Response Trail, also referred to as a Comments Report.

5.6.2 Legislative Context

According to Section 41(2) of the National Environmental Management Act, 107 of 1998 as amended (NEMA) "*the person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by—*

(a) Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—
  (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and
  (ii) Any alternative site."

Action – A site notice has been displayed on the electronic notice board at the Coega Business Centre. The e-notice will be displayed for the duration of the EIA process. This methodology and approach have been agreed to by both DEDEAT and DEFF. The e-notice replaces the site notice because the area in which the development is proposed, is remote and a site notice will not fulfil the intended purpose of the regulations.

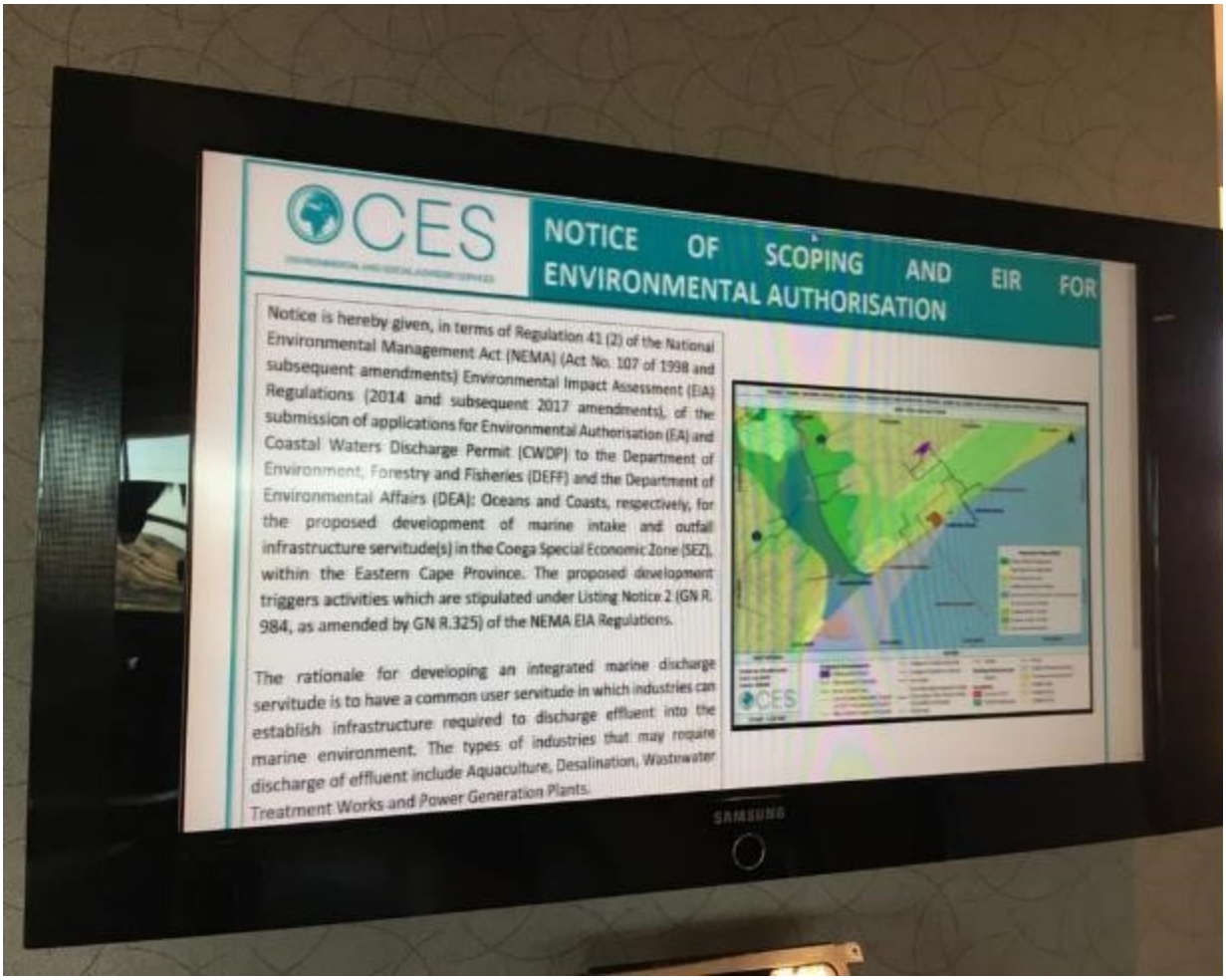


Plate 5.1. Proof of placement of site notice on the electronic notice board at the Coega Business Centre

(b) Giving written notice, in any of the manners provided for in Section 47D of the Act, to—

- *(i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
- *(ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
- *(iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
- *(iv) The municipality which has jurisdiction in the area;*
- *(v) Any organ of state having jurisdiction in respect of any aspect of the activity; and*
- *(vi) Any other party as required by the competent authority.*

Action -

Landowners and Occupiers:

The CDC (the applicant) owns the majority of the land on which the development is proposed. The names and contact details of those who lease land from the CDC has been provided to CES by the applicant and included in a stakeholder database and provided with a background

information document via e-mail (as all identified I&APs at this stage of the project have access to e-mail). One of the seawater intakes is proposed inside of the Port of Ngqura, which is owned by the Transnet National Ports Authority (TNPA). As the Application is for a linear activity, written consent is not required. However, the TNPA has been included in the stakeholder database compiled by CES and have been notified of the proposed development via email notification, inclusive of a letter of notification and Background Information Document (BID). The CDC has also notified the TNPA, via its environmental co-management structure, of the project and associated environmental assessment process. TNPA is also a member of the Environmental Liaison Committee (ELC) where environmental applications underway are presented and discussed. The remainder of the project area forms part of Coastal Public Property and is therefore state owned. DEA: Oceans and Coasts is directly involved with the proposed project as an Application for a Coastal Lease and Coastal Waters Discharge Permit (CWDP) is required for the discharge of treated effluent into the marine environment. The previous application submitted to DEA: Oceans and Coasts received a reference number (2014/008/EC/Coega IDZ) on the 24th of April 2019. This application number remains valid; however the application needs to be updated to reflect the most recent information. All stakeholders and Interested and Affected Parties (I&APs) will be notified of the development by means of a **phone call, sms and/or email notification**, inclusive of a letter of notification and Background Information Document (BID).

Adjacent Landowners and Occupiers:

As above. Additionally, a newspaper advertisement was placed in a local newspaper (The Herald) on the 13th of November 2020 and an electronic site notice has been displayed on the CDC's electronic notice board in the foyer of the Coega Business Centre.

Municipal councillor of the ward:

Cllr Nomazulu Mthi (Cllr Ward 53) and Cllr Mvuzo Ernest Mbelekane (Cllr Ward 60) of the Nelson Mandela Bay Municipality (NMBM) have been informed of the proposed development **telephonically (via sms) as well as via email notification**, inclusive of a letter of notification and BID.

Municipality:

Ngaba Bhanga (Executive Mayor) and Mandla George (Municipal Manager) of the NMBM were notified of the proposed development **telephonically (via sms) as well as** via email notification, inclusive of a letter of notification and BID. The NMBM is represented on the Coega Environmental Liaison Committee (ELC), the members of which are key stakeholders in all CDC's EIA applications.

Organs of State:

All organs of state applicable to the proposed development have been included in the stakeholder database compiled by CES (refer to Appendix 1 for a detailed list of stakeholders).

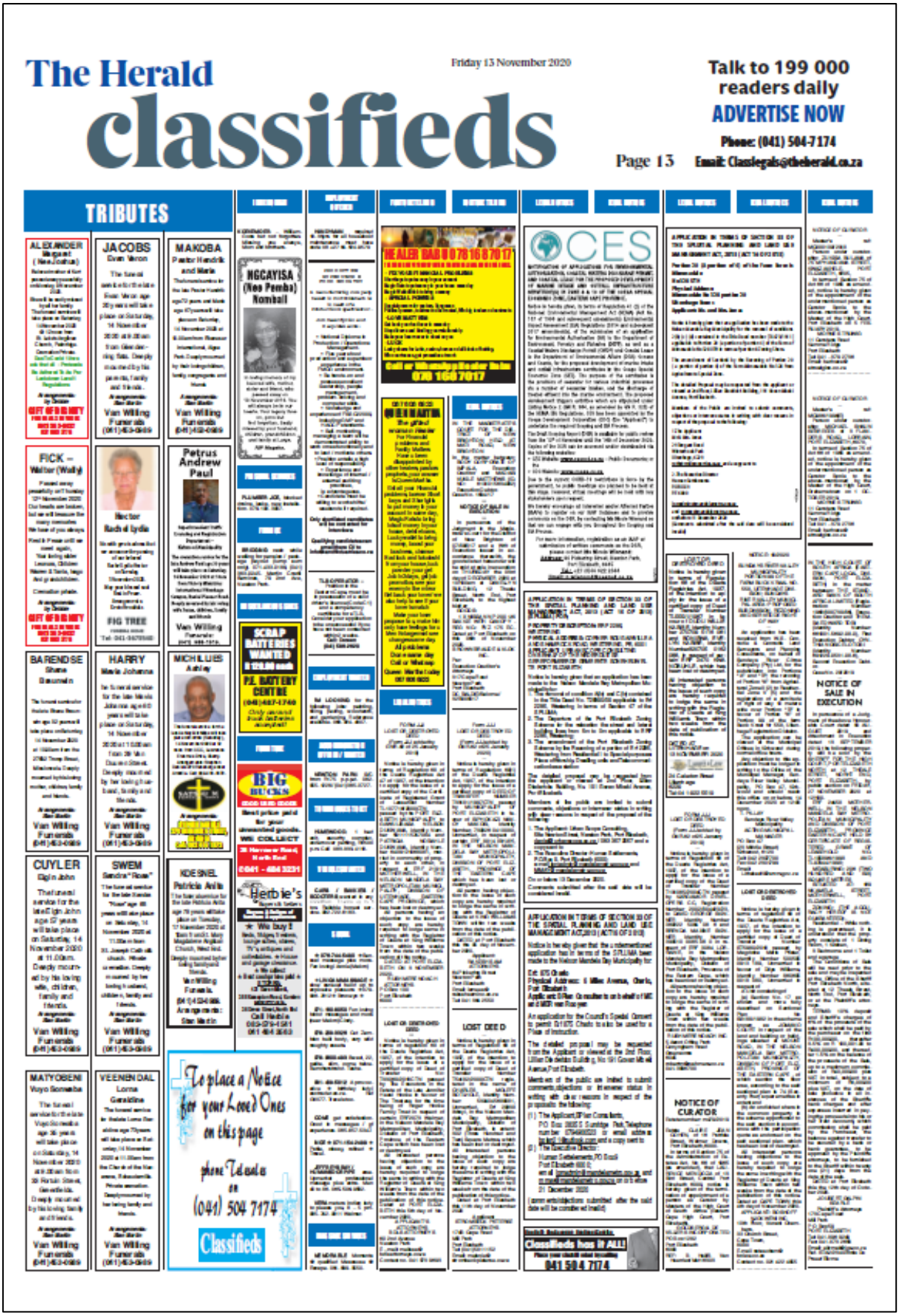
The advertisement and electronic site notice will provide any additional individuals with the project information and the opportunity to register on the stakeholder database. All documentation (electronic site notice, advertisement, BID, notification e-mails, etc.) will include a telephone number, postal address, e-mail address as well as a web address of the EAP in order to ensure that all means possible are available to stakeholders to register on the database and to provide comments on the project.

(c) Placing an advertisement in:
- *(i) One local newspaper; or*
- *(ii) Any official Gazette that is published specifically for the purpose of providing public*

notice of applications or other submissions made in terms of these Regulations;

(d) Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and

Action – A Newspaper advertisement was placed in The Herald, a locally and provincially distributed newspaper, on the 13th of November 2020 (Plate 5.2) in order to notify the general public of the submission of the application for Environmental Authorisation, as well as the availability of the Draft Scoping Report for a thirty (30) day public review period. The advertisement included a brief description of the proposed project, the main listed activities which are triggered by the proposed project, and the contact details of the EAP (phone number, e-mail address, web address and postal address). The advertisement also encouraged potential I&APs to register on the project I&AP Database and provide information on how to register as an I&AP (Plate 5.2).


The Herald
Friday 13 November 2020
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Page 13
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Petrus Andrew Paul
BARENDSE
Shane Desmond
HARRY
Mavis Johanna
MICHAUS
Ashley
CUYLER
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NOTICE OF SALE IN EXECUTION
NOTICE OF CURATOR

Plate 5.2: Newspaper advertisement placed in the Herald on the 13th of November 2020.

(e) Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to-
(i) Illiteracy;
(ii) Disability; or
(iii) Any other disadvantage.

Action -
Based on information available to date, all stakeholders can be notified either telephonically or via e-mail or both. Due to the current COVID19 restrictions in force by the government no public meetings are planned to be held at this stage. However, **virtual meetings will be held with key stakeholders upon request**. Virtual platforms such as zoom and Microsoft Teams are currently being used successfully to conduct virtual meetings. Both of these applications allow for the recording of these meetings and these recordings are then available for download. In addition, at least two (2) Environmental Liaison Committee (ELC) meetings will be conducted on a virtual platform. In addition, to ensure full coverage of potential I&APs a number of Background Information Documents will be delivered to the Ward Councillor's offices for distribution amongst the community. No radio advertisements will be run on local news stations at this stage as the closest community to the CDC is approximately 7 km to the west (Motherwell).

In addition to the above and according to Section 42 of the EIA Regulations "*a proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of-*
(a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
(b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
(c) All organs of state which have jurisdiction in respect of the activity to which the application relates."

Action - Contact details of all stakeholders who have been identified, and/or who have registered as I&APs on the proposed project, are provided in Appendix 1.

5.6.3 Public Participation Tasks

The Public Participation Process will be divided into four phases which allows for initial (pre-application) stakeholder identification, as well as engagement during the Scoping Phase, the EIA Phase and the Environmental Authorisation Phase. The tasks which will be carried out at each phase are described in the table below:

Date	Phase	Meeting and/or deliverable	Objective
1 July 2020	Initiation	Placement of e-notice at CDC Business Centre	To comply with Section 41 of NEMA
06 November 2020		Distribute pre-assessment notifications as stipulated in the Sections outlined above	To comply with Section 41 of NEMA
13 November 2020	Scoping Phase	Distribute notifications of the availability of the Draft Scoping Report for public review as stipulated in the Sections outlined above	To comply with Section 40 of NEMA

Date	Phase	Meeting and/or deliverable	Objective
15 December 2020		Compile Comments and Response Trail for incorporation into the Final Scoping Report	As per legal requirements all issues and/or comments raised by registered interested and affected parties needs to be documented in writing and responded to by the EAP
1 March 2021	EIA Phase	Distribute notifications of the availability of the Draft EIR for public review as stipulated in the Sections outlined above	To comply with Section 40 of NEMA
30 March 2021		Compile Comments and Response Trail for incorporation into the Final EIR	As per legal requirements all issues and/or comments raised by registered interested and affected parties needs to be documented in writing and responded to by the EAP

5.6.4 Issues and Response Trail

Please note that the original responses related to historical comments have been left in the IRT as these are what has been reported to I&APs during those respective processes. **Where relevant, CES has provided additional comments. These are marked with an * and is shown in italics.**

I&AP	COMMENT	RESPONSE
COMMENTS RECEIVED FROM I&APs ON THE NOTICE OF REACTIVATION OF THE EIA PROCESS IN 2016 BY CEN INTEGRATED ENVIRONMENTAL UNIT		
Jeanne Vorsatz - Aurecon	What type of marine dispersal studies will be done and what is the duration of the studies	Anchor Environmental are doing the marine specialist study and dispersion model. The study will include the following (this is extracted from terms of reference for their study): 1. Description of the affected hydrographical and geophysical environment 2. Detailed description of the hydrodynamic processes (i.e. currents, water column stratification, water temperature variability and turbulence) for a range of environmental conditions (i.e. for various tides, waves, winds and air-sea fluxes as experienced in the affected marine environment) 3. Detailed description of the biogeochemical processes (water column and sediment) 4. Modelling: The behaviour of the effluent plumes for discharge points will be evaluated and modelled under various scenarios using a near-field dilution model (most probably with the software program CORMIX, MixZon Inc., USA) and a far-field dispersion model (most probably the Regional Ocean Modelling System, Shchepetkin and McWilliams 2005). Modelling studies will be used to determine the nearshore and farfield ocean circulation patterns under a variety of wind conditions, the main driver of surface currents in the ocean. The dispersion and advection of the effluent will be simulated using a passive tracer approach, which will serve as proxy for the effluent. In addition, the dispersion and advection of temperature and salinity will also be simulated since the effluent will contain fresh water at a temperature different from that of the receiving marine environment. The three dimensional model will include the oceans response to, wind, tides, temperature stratification, salinity as well as heat fluxes to account for air-sea interactions. It is proposed that the behaviour of the effluent be simulated for a representative range of environmental conditions. Moreover, experiments will be conducted, where the effluent is released at different locations in the model domain, for example closer vs. further away from shore. The model will be validated against available observations deployed
Jeanne Vorsatz - Aurecon	What type of studies are proposed for determining existing marine taxa in the marine environment that are likely to be affected by the servitude	

I&AP	COMMENT	RESPONSE
		in the region, including temperature, salinity and current measurements, as well as historical data and previously documented studies of the area. Twelve scenarios will be simulated: The plume dimensions will be determined based on exceedance of water quality target values pertinent to the effluent to be discharged. These water quality target values will be decided in consultation with the specialists undertaking the ecological assessments. The results of the modelling exercises will inform the best location of the pipeline along the coast and at what depth the effluent would be best discharged. It is also envisaged that this will provide information on dilution rates and the spatial and temporal footprint of the effluent plume. **Note** that since the original terms of reference of was approved, the volumes of effluent to be discharged and abstraction volumes of seawater have increased substantially. A midfield model will also be done to determine possible interactions between the discharge plumes (if more than one servitude is proposed) and also between the plume and abstraction points 5. Marine ecological assessment: a. Desktop study: • Production of a geo-referenced map showing the distribution of the various habitat types and the associated biological resources that highlights areas with: o Biological resources of conservation importance o Biological resources targeted for exploitation o Biological resources that have been lost, or are stressed, as a result of anthropogenic influence o Biological resources endemic to that area. • A list of dominant species, species of particular conservation importance and species targeted for exploitation, with best estimates of spatial and temporal variability. • Likely migration routes and patterns of above mentioned species in relation to estuary mouths in the region (Coega, Sundays, and Swartkops estuaries) • List of biological resources that are potentially sensitive to anthropogenic influences already present in the area and/or that may be sensitive to constituents present in the proposed wastewater discharge, and quantification of cause-and-effect relationships as best as possible (i.e. to refine the ecological quality objectives).

I&AP	COMMENT	RESPONSE
		• Assessment of the likely impacts of the proposed discharge on the habitat of the species identified above **Please note that the above studies were completed as part of the EIA process undertaken in 2016.* *In 2016 PRDW undertook marine effluent dispersion modelling for 12 potential discharge scenarios, to inform the movement of the discharge plumes and possible interactions with planned abstraction points (PRDW, 2016). PRDW has modelled additional scenarios in 2020 based on the updated effluent characterisation and refined intake and outlet locations obtained from the results of the previous modelling exercise. In addition, as part of wider assessments on the proposed marine pipeline servitude, PRDW contracted Lwandle Technologies (Pty) Ltd (Lwandle) to conduct an ecological risk assessment of the effects on the receiving environment. This report provides the environmental context in which the proposed discharges will operate based on existing survey information and scientific publications, specify receiving water quality guidelines that should apply in the water body, define mixing zone dimensions where effluent constituent chronic toxicity levels may exceed water quality guideline thresholds, and conduct toxicity effects evaluations on predicted effluent constituent distributions in the receiving environment of the discharges. The report produced by Lwandle should be read in conjunction with the PRDW (2020) report: Marine Pipeline Project for the Coega Special Economic Zone, Marine Effluent Dispersion Modelling, PRDW Report No. S2001150-CE-001-R1, which provides the simulation modelling on which the interpretations and findings of the current report are based. These reports have now been finalised and are appended to this Final Scoping Report as Appendix 5 & 6.* *Furthermore, the existing Baseline Marine Ecology Report will be updated with additional dispersion modelling results, undertaken by PRDW in 2020. This report is currently in progress and will be submitted to the DEFF as part of the EIR submission.*
Jeanne Vorsatz - Aurecon	Are there any alternative process treatments that are being investigated instead of marine discharge	At this stage, the idea is that the marine model will set standards that need to be met by investors prior to discharge. It will be up to individual industries to decide what treatment methods to employ to meet standards. However, depending on the outcomes of the midfield model, it may be necessary to implement pre-treatment of effluent prior to discharge. This will be reported on in the EIA phase **** Best practise will be to use as much of the seawater for other activities as possible prior to discharging back to the marine environment. For example, the brine from a desalination plant will ideally not be discharged but could be supplied to an off-taker***

I&AP	COMMENT	RESPONSE
		for use in salt or chlorine manufacturing. Similarly, (some) seawater from the abalone farms could be diverted to a desalination plant. As such, alternatives to discharges are being considered, however, this EIA will be assessing the worst case scenario, i.e. all effluents generated to be discharged to the marine environment. *In addition, modelling undertaken in 2020 showed that both wastewater options should have restricted effluent concentrations based on the achieved dilutions obtained from the model (i.e. treated on land prior to discharge).*
Jeanne Vorsatz - Aurecon	What type of emergency/mitigation measures are being investigated in the event of a discharge pipeline breach	The Scoping Report has identified risks/environmental impacts for further assessment at EIA stage. Emergency/mitigation measures will be listed at EIA stage. **Mitigation measures currently include the following:* *The pump stations will have a built-in safety mechanism in the event of loss of pressure.* *Regular maintenance inspections* *Additional emergency / mitigation measures will be explored in the EIA Phase if required.*
Dan Abraham - Aurecon	Interested in the project, and request to be registered as an IAP	Registered on the IAP database for the project and will be kept updated of the process and all further documentation **Dan Abraham has been included in the revised list of I&APs*
Chris Albertyn - LAQS	Request to be registered as an IAP	Registered on the IAP database for the project and will be kept updated of the process and all further documentation **Chris Albertyn has been included in the revised list of I&APs.*
Dave Louw - Cerebos	Our interest in the matter arises in that we currently pump seawater from the immediate vicinity of the proposed abstraction and effluent discharge areas, for purposes of salt manufacture, and wish to ensure the continued quality of such supply, especially with regard to possible pollution concerns of discharging effluent to these areas	Noted, thank you. This information has been sent to the marine specialist for consideration in the dispersion model. The Saltworks will be regarded as an existing 'beneficial user', where water quality of the user cannot be compromised by the proposed discharge servitude **Please note that the Cerebos intake located in the Port of Ngqura has been taken into consideration in the dispersion modelling undertaken for the project both in 2016 and in 2020. Due to the high number of dilutions required for the worst-case waste water effluent, the expected waste water effluent conditions were also tested. Under expected waste water effluent conditions, the dilutions (and therefore the environmental guidelines) are achieved for all the proposed seawater intake locations except for the Cerebos seawater intake inside the port. For other effluents,*

I&AP	COMMENT	RESPONSE
		good dilutions are achieved at the proposed intake locations. As such, any waste water discharge via the Coega River will have to be treated on land to meet the required water quality guidelines prior to being discharged.
Marisa Bloem - DWS	Requested a hard copy of the Draft Scoping Report for commenting purposes	Noted. A hard copy of the DSR will be delivered to DWS's offices **DWS is included in the stakeholder database.*
Huldah Solomon - GMS	General Motors SA has an effluent discharge permit from the NMBM. Request to be registered as an IAP	Noted, thank you. Registered on the IAP database for the project and will be kept updated of the process and all further documentation **Huldah Solomon has been included in the revised list of I&APs.*
Mulalo Tshikotshi – Oceans and Coasts	Requested additional information on the option of positioning the discharge servitude on the Port of Ngqura breakwater. Indicated that as long as the discharge does not compromise water quality for aquaculture or any surrounding sensitive ecosystems, it will be acceptable	A copy of the BID was sent to Oceans and Coasts that identified possible alternative positions of the discharge servitude. **Oceans and Coasts is included in the stakeholder database.*
Paul Martin – Environmental Control Officer for the IDZ and Port of Ngqura	Please ensure that I am registered as an I&AP and throughout the EIA process please supply full electronic copies (e.g. including specialist reports) of whatever documents become available	Registered on the IAP database for the project and will be kept updated of the process and all further documentation. **Paul Martin has been included in the revised list of I&APs.*
Paul Martin – Environmental Control Officer for the IDZ and Port of Ngqura	Presumably dispersion modelling will be done to look particularly at the possible effect on Jahleel Island. Note that Stellenbosch University is modelling the currents and sand movements with respect to the sand by-pass at present and there will be synergies with this project (Nomkhitha Kwinana, Enviro Manager at the Port is the contact at TNPA[3]). There seems to be a build-up of sand between Jahleel and the E Breakwater due to the sand by-pass discharge - this may have an influence (e.g. the pipe entrance could get buried in sand eventually).	** The dispersion modelling conducted by PRDW (2020) has investigated physical and chemical dispersion impacts on Jahleel Island. The ecological specialist study by Anchor Environmental will address the ecological impacts based on the physico-chemical projections per the dispersion modelling.*

[3] Note that the current contact at TNPA is Mandilakhe Mdodana

I&AP	COMMENT	RESPONSE
Paul Martin – Environmental Control Officer for the IDZ and Port of Ngqura	You are obviously aware of the Damara Tern breeding colony (South Africa's rarest breeding seabird)	**We are aware of the Damara Tern population in Zone 10 of the SEZ. This has been included in the sensitivity map available as Figure 2.21 in Chapter 2 of this report.*
Paul-Pierre Steyn - NMMU	I am a lecturer in the NMMU Botany Department and a researcher with the NMMU Institute for Coastal & Marine Research. I am involved in marine research in Algoa Bay, Hougham Park, and the inshore islands. I would like to register as an I&AP in order to remain informed of the process and the issues that arise	Registered on the IAP database for the project and will be kept updated of the process and all further documentation. **Paul-Pierre Steyn has been included in the revised list of I&APs.*
Melinda Labuscagne and R Le Roux – NMBM Waste Management	Request to be registered as an IAP	Registered on the IAP database for the project and will be kept updated of the process and all further documentation. **Melinda Labuscagne and R. le Roux has been included in the revised list of I&APs.*
COMMENTS RECEIVED FROM I&APs ON THE PRE-APPLICATION NOTICE OF THE EIA PROCESS IN 2016 BY CEN INTEGRATED ENVIRONMENTAL UNIT		
Carmen Barends – Leads 2 Business	Request to be registered as an IAP and a copy of the BID	Registered on the IAP database for the project and will be kept updated of the process and all further documentation. Copy of BID provided. **Carmen Barends has been included in the revised list of I&APs.*
John Geeringh - ESKOM	No comments but request to be registered and kept informed	Registered on the IAP database for the project and will be kept updated of the process and all further documentation. **John Geeringh has been included in the revised list of I&APs.*
Ronald Smith – Digistics (Zone 1, Coega IDZ)	Request to be registered as an IAP	Registered on the IAP database for the project and will be kept updated of the process and all further documentation. **Ronald Smith has been included in the revised list of I&APs.*
Mandilakhe Mdodana - TNPA	Requested clarity on the date when comments on pre-application notice should be submitted as Pg 11 of the BID stated 7 September.	Confirmed that the closing date for comments is 7 October 2016 as indicated in the body of the email notice and the front page of the BID Noted. Impacts of construction of infrastructure related to the proposed discharge and abstraction servitudes, as well as that of discharge of effluent and potential impact on water and sediment quality in the Port will be assessed in this EIA process.

I&AP	COMMENT	RESPONSE
	Noted that TNPA is the holder of an environmental authorisation for the Port and may be affected by the proposed servitude. The Port has an obligation of ensuring its activities do not affect the natural environment negatively and all impacts associated with its activities are kept at minimal levels.	** This issue related to the EIA process and timelines related to the application submitted in 2016 and is thus not relevant here. The CDC (the applicant) owns the majority of the land on which the development is proposed. The names and contact details of those who lease land from the CDC has been provided to CES by the applicant and included in a stakeholder database and provided with a background information document via e-mail (as all identified I&APs at this stage of the project have access to e-mail). One of the seawater intakes is proposed inside of the Port of Ngqura, which is owned by the Transnet National Ports Authority (TNPA). As the Application is for a linear activity, written consent is not required. However, the TNPA has been included in the stakeholder database compiled by CES and have been notified of the proposed development via email notification, inclusive of a letter of notification and Background Information Document (BID). The CDC has also notified the TNPA, via its environmental co-management structure, of the project and associated environmental assessment process. TNPA is also a member of the Environmental Liaison Committee (ELC) where environmental applications underway are presented and discussed.*
Alan Southwood - DEDEAT	Requested to be registered as an IAP for the process, and to receive hard copies of the reports for commenting purposes	Registered on the IAP database for the project and will be kept updated of the process and all further documentation. A hard copy of this DSR has been made available to Mr Southwood. **Alan Southwood has retired from DEDEAT since the last application was lodged. DEDEAT has however been notified of the proposed project.*
Hugo Badenhorst – PPC Cement SA (Pty) Ltd	PPC provided a map indicating the area north-east of the Port where they have mining rights to mine sand dunes and plan to mine in the future. Potential conflicts between mining and planned infrastructure required as part of the proposed abstraction and discharge servitude were noted and objected to.	The EIA process and planning of infrastructure required for the abstraction and discharge servitude(s) will be taken cognisance of. PPC will be engaged throughout the process to avoid conflicts with their mining areas. **The planning for Zone 10 has taken existing mining rights into consideration. The CDC has a long-standing co-operative relationship with PPC (Pty) Ltd in the process of developing the Coega SEZ. The CDC has obtained written consent from PPC to submit an application in terms of section 53 of the MPRDA to utilize the land over which PPC have mining rights, for aquaculture purposes and for the establishment of the marine pipeline servitudes.*

I&AP	COMMENT	RESPONSE
Lesa la Grange - SAHRA	Noted that all official comments are now processed electronically via SAHRA's online platform (http://www.sahra.org.za/sahris/). To ensure a timely response to all correspondence relating to the case, SAHRA requested that any documents pertaining to the proposal be uploaded to an application on SAHRIS as they become available Recommended that an archaeological specialist survey the area to assess heritage impacts in full.	Thank you, and noted. All future documents will be uploaded to the website for comment. An underwater archaeological specialist has been appointed to survey the selected servitude(s) areas. **The Draft Scoping Report as well as the Final Marine Heritage Assessment, was submitted to SAHRA via their online platform. Comments received by SAHRA have been included below under the sections related to this application (proof included in Appendix 1: Public Participation Process). The marine heritage assessment submitted to SAHRA is available as Appendix 7 to this report.*
Dr Ane Oosthuizen - SANParks	SANParks note that the Islands and proposed MPA as part of Addo ENP has been identified as sensitive areas. Please keep SANParks on the stakeholder list	Thank you and noted. The islands and proposed MPA have been identified as sensitive areas in the baseline marine ecology report. The marine dispersion model will assess the movement of the discharge plume and water quality at the edge of the required mixing zone from servitude areas in relation to these sensitive habitats. **CES is aware of the marine protected area on the Eastern side of the Eastern Breakwater. This marine protected area has been taken into account in the Dispersion Modelling and the Marine Ecological Report undertaken for the proposed project. The Marine Protected Area has also been included in the Scoping Report, inclusive of the sensitivity map included in Chapter 2 (Figure 2.21). The National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) Regulations for the management of the Addo Elephant National Park Marine Protected Area (23 May 2019) was also consulted in drafting the Scoping Report. SANParks, specifically Ane Oosthuizen remains an I&AP on the revised application and has provided revised comments which are included in the section below related to this application. Proof of this is included in Appendix 1 of this report.*
Dr Paul Martin – ECO for the IDZ and Port of Ngqura	Confirmed that he is still a registered IAP. Noted that he can make recent data on Damara Terns available. There has been a significant increase in their breeding in the area in January 2016	Confirmed that he is still a registered IAP for the process. A copy of the BID was made available. Requested further details on the Damara Tern and any other relevant data that would be useful in the assessment of impacts related to the project. **The latest (2020) monitoring information for the Damara Tern (Coega Mining: Abalone Farm Site) was obtained from the CDC. Surveys were conducted on the 16th of October, the 12th of November and the 11th of December. Monitoring data showed that there were 2 adults flying around the Zone 10 dunefields on the 12th of November (i.e. on territory) and 2 birds feeding at sea opposite the old abalone Farm on the 11th of December. On 11th January 2021, a flock of 6 Damara terns were observed feeding in the shore break opposite the old abalone farm.*

I&AP	COMMENT	RESPONSE
		However, no nests have been observed this season to date. This will be the first season since 2014 that the Damara terns have not nested. However, on the 13th of November there were 4 nests and 2 pairs on territory at Schelmhoek. As this is considered to be early for this site (nesting usually only observed during December), it could be possible that the Damara Terns have relocated from the Abalone Farm site to the Schelmhoek Site. No change was observed in the Alexandria Dunefields site. In addition to this monitoring data, the following reports were obtained from the CDC: *Monitoring of Breeding Damara Terns, Algoa Bay, October 2019-March 2020* *Proposed Coega Mining Right Application, Zone 10, Coega Special Economic Zone, Nelson Mandela Bay Municipality, Avifauna Impact Assessment and Damara Tern Specialist Report. November 2019.* *Both of these reports, as well as the most recent monitoring data has been forwarded to the Ecological Specialist for inclusion in the Ecological Impact Assessment which will be submitted as part of the EIA submission.*
Peter Myles	Requested clarity on the date when comments on pre-application notice should be submitted as Pg 11 of the BID stated 7 September	Confirmed that the closing date for comments is 7 October 2016 as indicated in the body of the email notice and the front page of the BID **This issue related to the EIA process and timelines related to the application submitted in 2016 and is thus not relevant here.*
Kwanele Gxoyiya - Commercial Legal Advisor for MTU South Africa (Pty) Ltd	Rolls-Royce Power Systems (the holding company of MTU South Africa) is part of a consortium which seeks to respond to the Gas to Power project in the Coega IDZ. Requested to be registered as an IAP to provide input w.r.t. their technology (reciprocating gas engines) and the possible impact it may have on the environment.	Explained that CEN IEM Unit is handling the EIA process for the marine servitude, which includes possible abstraction and discharge by a CCGT power plant. Registered as IAP and sent a copy of the BID. Advised the IAP to register for the EIA process for the CCGT power plant being handled by SRK Consulting. Contact details for SRK provided. SRK made contact with IAP. **No further comment related to this issue*
Brian Bouwer	Requested to be registered as an IAP	Registered on the IAP database for the project and will be kept updated of the process and all further documentation. Copy of BID made available. **Brian Bouwer has been included in the revised list of I&APs.*
COMMENTS RECEIVED FROM I&APs ON THE DRAFT SCOPING REPORT SUBMITTED TO AUTHORITIES IN 2016 BY CEN INTEGRATED ENVIRONMENTAL UNIT		

I&AP	COMMENT	RESPONSE
DEDEAT – Alan Southwood / D Govender	The Scoping Report adequately addresses issues that require assessment during the EIA process. The Plan of Study is accepted.	Noted, thank you **This issue related to the EIA process related to the application submitted in 2016 and is thus not relevant here.*
SANParks – Anè Oosthuizen	Please note: Notice of intention to declare the Addo Elephant MPA was Gazetted on 3 February 2016 (GN 39646)	Noted, thank you. The marine specialist study and nearfield dispersion model have taken cognisance of the proposed MPA, and have viewed it as being gazetted. The proposed extent of the MPA is regarded as a critical sensitive environment, and discharge positions and scenarios considered in the nearfield dispersion model did not place any discharges into the MPA. **CES is aware of the marine protected area on the Eastern side of the Eastern Breakwater. This marine protected area has been taken into account in the Dispersion Modelling and the Marine Ecological Report undertaken for the proposed project. The Marine Protected Area has also been included in the Scoping Report, inclusive of the sensitivity map included in Chapter 2 (Figure 2.21). The National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) Regulations for the management of the Addo Elephant National Park Marine Protected Area (23 May 2019) was also consulted in drafting the Scoping Report. SANParks, specifically Ane Oosthuizen remains an I&AP on the revised application and has provided revised comments which are included in the section below related to this application. Proof of this is included in Appendix 1 of this report.*
SANParks – Anè Oosthuizen	Why are there now 2 servitudes being investigated? (Recommend the positions of 2 marine-based servitudes in which future industries can establish infrastructure for abstracting seawater i.e. one to service the requirements of the aquaculture development zone and desalination, and another to service the requirements of the proposed CCGT power stations.)	Owing to the diverse nature of the different industries that may abstract seawater from the servitude over time, various quality and volume parameters have to be considered when determining the number and position of the abstraction servitudes, and the type of infrastructure needed in the servitude. At this stage, it is anticipated that industrial seawater requirements will comprise two broad abstraction scenarios – i.e. a high volume, lower quality seawater need for industries such as the planned CCGT power plant for example, and a lower volume better quality seawater need for facilities such as the planned ADZ for example. Depending on the volume of seawater required, different types of abstraction infrastructure will be used which has implications from an engineering design and cost perspective (which is indirectly related to the position of the servitude). Water quality requirements will determine the position and depth/distance from the high water mark into the marine environment of the abstraction servitude. Further, the position of the discharge servitude will also have bearing on the position of the abstraction servitudes, and possible draw-back of effluent into the abstraction servitude needs to be considered. Because of these factors, it may be necessary to have two abstraction servitudes. Current thinking is to have an abstraction servitude for cooling water in the Port, and

I&AP	COMMENT	RESPONSE
		a second abstraction servitude for the ADZ and other industries that need better water quality in the marine environment on the eastern side of the Port closer to Zone 10. This will be finalised once results of the midfield model are available. **CEN Response above still valid. It has been confirmed (as a result of the dispersion modelling undertaken in both 2016 and 2017) that two intake servitudes will be required for the proposed project. The 2016 PRDW Concept Design Report assessed three (3) broad "locations" for the abstraction of seawater for aquaculture (i.e. it did not consider the power station cooling water requirements, as this project had not been conceptualised at that time). These included:* • *East of the Port of Ngqura;* • *In the vicinity of the Port of Ngqura, and;* • *West of the Port of Ngqura.* *The conclusion was that locating an intake servitude east of the Port of Ngqura is the most feasible alternative mostly due to economic benefits associated with abstracting seawater closer to the aquaculture zone.* *The 2017 PRDW Dispersion Modelling Report assessed six (6) locations for the proposed seawater abstraction or intake points, with a view to identifying common seawater intake servitudes. Compared with the 2016 PRDW Concept Design Report, this analysis also included cooling water. The six locations included (refer to Figure 2.15 in Chapter 2 of this report):* • *W1 - Western intake at -10 m Chart Datum (CD)* • *W2 - Western intake at -16 m CD* • *CW - Cooling water intake inside the Port of Ngqura* • *CB1 - Cerebos intake within the Port of Ngqura* • *CB 2 - Cerebos intake at Sundays River Mouth* • *E1 - Eastern intake at -10 m CD* *The following conclusions were arrived at with respect to the preferred marine intake servitude locations:* • *W1, W2 and CB2 were identified as **'not viable'** for seawater intake due to the large volumes of water required for cooling water and aquaculture development and the long distance of these sites from the power station sites and aquaculture zone, resulting in significantly higher economic costs due to the much longer reticulation distance.*

I&AP	COMMENT	RESPONSE
		• *CW and CB1 were considered **'potentially viable'** if separate aquaculture and cooling water intakes are constructed, as the quality of the seawater within the Port of Ngqura is not suitable for aquaculture.* • *E1 was considered to be **'potentially viable'** since the required effluent dilutions can be achieved, but still subject to the outcome of the marine ecological impact assessment in the EIA phase.* *Thus, the preferred alternative for the location of the marine intake servitude would be two (2) separate seawater intake servitudes locations:* • *Intake servitude 1: Seawater for Once-Through Cooling and Wet Mechanical Cooling located inside the Port of Ngqura; and* • *Intake servitude 2: Seawater for aquaculture and desalination located to the east of the Port of Ngqura.*
SANParks – Anè Oosthuizen	Chap 1, Point 1.3.2 , first paragraph, the last two sentences about the collection chamber does not make sense? Will there be sampling to test for quality/standards? Will the effluent be held? How large will this chamber be? What will be the retention time?	Apologies, the last sentence is meant to read: 'If it is found that the collective effluent contained in the collection chamber exceeds permit standards prescribed for the ADZ, then further treatment on land will need to be investigated and implemented. This will be managed via the Coastal Water's Discharge Permit and the CDC's monitoring and reporting process to the DEA.' It is envisaged that the collection chamber will be a good area to monitor the 'cocktail' of effluent from various facilities in the ADZ prior to it being discharged via the servitude. This EIA (via the marine dispersion model and marine specialist study) will determine effluent quality standards that various industry types will need to meet before discharging from land – this would include effluent from various facilities in the ADZ that would gravitate to a common collection chamber from where it would be sent to the discharge servitude. Details on the position, size, retention time etc. of the collection chamber will be provided at EIA stage once engineering concept design reports are available. **There is no collection chamber envisioned as part of the revised project description.*
SANParks – Anè Oosthuizen	It is difficult to make recommendations without the completed modelling results, and with the Nearfield model (App 5) and Conceptual Engineering design (App 3) not talking to each other in terms of discharge and intakes. However SANParks would still prefer the discharge outlet to be as far away as possible from the Islands and proposed MPA, to	Appendix 3 is a conceptual engineering design report for the ADZ only and was done prior to the nearfield and midfield dispersion models. It was included in the DSR to demonstrate the type of infrastructure that the ADZ would require between Zone 10 and the abstraction / discharge servitudes, as well as possible abstraction and discharge infrastructure designs; rather than the preferred position of servitudes. The nearfield model considered 12 discharge scenarios from 4 discharge positions, and identified a number of scenarios where water quality standards in the receiving

I&AP	COMMENT	RESPONSE
	give greater chance of dispersal. From the nearfield model it seems that a combined discharge would be best, because of the diluting effect of the cooling water? But yet from Appendix 3: it would seem options 1 or 3 : discharge pipe tunnelled underneath the shore and surf zone would be best?. Option 2, with a standalone breakwater would be unacceptable. It would be unnecessary to put more infrastructure onto the shore.	environment at the edge of the Required Mixing Zone are met. It is important to note that the model did not assess any discharges into the proposed MPA boundary, and that of the outfall options that meet water quality requirements at the edge of the RMZ, none of the predicted effluent footprints interact with any of the sensitive areas identified (including the MPA or islands and their buffers). The next step is to do a midfield model which will ultimately determine the preferred position of the abstraction and discharge servitudes. The midfield model is required in addition to the nearfield model for the following reasons: a. To investigate plume interaction between multiple discharges. Water quality guidelines must be met before the point of effluent plume interaction. b. To predict the effect of water abstraction on effluent plume movement. c. To validate the results of nearfield modelling. d. To more accurately estimate dilution values beyond the nearfield ** The 2016 PRDW Concept Design Report assessed three (3) broad "locations" for the discharge of aquaculture effluent (i.e. it did not consider the power station cooling water requirements, as this project had not been conceptualised at this time). These included:* • *East of the Port of Ngqura;* • *In the vicinity of the Port; and* • *West of the Port.* *The conclusion was that locating the effluent discharge servitudes east of the Port of Ngqura was the most feasible alternative mostly due to economic benefits associated with discharging the effluent closer to its source in the aquaculture zone located in Zone 10 of the Coega SEZ, east of the Port.* *In 2017, PRDW conducted a marine dispersion modelling exercise where 12 marine effluent discharge scenarios were developed and then modelled for the defined range of potential effluents. In addition to these 12 scenarios, 3 more scenarios were inferred from results of the modelled scenarios from six (6) sites (Figure 2.16 included in Chapter 2 of this report):* • *Option 1 – Approximately 2 km south-west of the western breakwater, at 10 m depth;* • *Option 2 – Approximately 2 km south-west of the western breakwater, at 16 m depth;*

I&AP	COMMENT	RESPONSE
		• *Option 3 – Along the seaward side of the eastern breakwater, with the discharge point at the elbow of the breakwater;* • *Option 4 – Along the seaward side of the eastern breakwater, with the discharge point at the end of the breakwater;* • *Option 5 – Approximately 900 m to the north-east parallel to the eastern breakwater, at 10 m depth; and* • *Option 6 – Approximately 900 m to the north-east parallel to the eastern breakwater, at 20 m depth.* *The dispersion modelling analysed the mixing zones of 100 m and 300 m from the discharge point. Water quality guidelines were also applied at locations of sensitive receptors, including the boundary of the Addo Elephant Marine Protected Area (MPA), 300 m from the boundary of the MPA, Jahleel Island, 100 m from Jahleel Island and the Port of Ngqura entrance.* *The results of the dispersion modelling which informs the preferred location for discharging effluents, are summarised below.* *The location of the discharge servitude west of the Port was identified as **'not viable'** for the construction of the proposed servitude for the following reasons:* • *Effluent will need to be pumped around the perimeter of the Port which would result in significantly higher capital and operational costs compared with an eastern discharge.* • *Although the required dilutions can be achieved, discharges west of the Port at -10 m will enter the Port, which increases the risk of accumulation of particulates with associated nutrients and heavy metals. If the pipeline is extended to -16 m, the achieved dilutions reduce the risk of effluent entering the Port. However, there is still a risk of accumulation of particulates with associated nutrients and heavy metals.* *Discharging of effluent within the Port was identified as **'not viable'** for the following reason:* • *Discharges will potentially become trapped in the Port resulting in accumulation of particulates with associated nutrients and heavy metals.* • *Disposal of effluent inside the Port may impact on Transnet's ability to meet the permits requirements as per their Dredge Disposal Permit.* *Discharge east of the Port was deemed as being **'potentially viable'** for the following reason:*

I&AP	COMMENT	RESPONSE
		• *The required dilutions can be achieved with no risk of effluent entering the Port or unacceptable environmental damage to the Marine Protected Area (MPA). In addition, the National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) and the Regulations for the management of the Addo Elephant National Park Marine Protected Area (23 May 2019) Section 10(2) make allowance for discharges into the Addo MPA.* *In 2017 PRDW undertook marine effluent dispersion modelling for 12 potential discharge scenarios, to inform the movement of the discharge plumes and possible interactions with planned seawater abstraction points (PRDW, 2017). In 2020, PRDW extended their investigation to model additional scenarios based on the updated effluent characterisation and to refine optimal intake and outlet locations.* ***It is important to note*** *that at this point, abstraction and effluent dispersion modelling was limited to east of the breakwater, due to discharging to the west of the Port and inside the Port having been excluded as viable options.* *It should also be noted that 11 of the 12 discharge scenarios tested by PRDW in 2017 comprised only one discharge location and one effluent, with only one scenario having combined effluents, since the focus of this initial dispersion modelling exercise was to compare different broad discharge locations. The 2020 study comprised* ***worst-case effluent scenarios*** *and multiple discharge locations with all the effluents being discharged simultaneously in order to test the combined impact. The characteristics of each individual effluent were provided by the CDC based on the respective industry specialist input. In addition, the modelling of the worst-case discharge scenario required assigning an intake and discharge location for each of the six effluent streams. The intake and discharge locations were chosen to align with the relevant infrastructure within the SEZ as provided by the CDC.* *The worst-case discharge scenario was run for the summer and winter months. The model outputs show the achieved dilutions in each horizontal and vertical element of the computational mesh at 1-hour intervals throughout the simulation period. Figure 2.18 below provides an example of the dilution contours for worse-case finfish aquaculture effluent.* *The following conclusions were drawn from the 2020 marine dispersion modelling study:*

I&AP	COMMENT	RESPONSE

		• *All the discharges considered can meet the applicable water quality guidelines (WQGs) (The marine WQGs currently in force are those defined in DWAFF (1995). These have been reviewed and updated in DEA (2019) but these are still in draft form and are not yet gazetted. Therefore, here the DWAFF (1995) version of the guidelines are followed primarily but are augmented by WQGs from other jurisdictions where required, e.g. ANZECC (2000), IFC (2009), along with peer-reviewed toxicity test data) within the 300 m mixing zone, except for wastewater and the combined brine and finfish discharge.*
		• *With respect to wastewater, the maximum allowable effluent concentrations (end of pipe) for E.coli, TKN + NH_4 and TSS must be limited in order to meet the Guidelines.*
		• *To ensure compliance, the brine and finfish effluent should be discharged separately.*
		• *Both the cooling water discharges tested meet the guidelines.*
		• *Should additional constituents be added to the effluent streams or identified in future, then the end-of-pipe concentrations of these constituents will need to be limited based on the achieved dilutions from the dispersion model as provided in the modelling report (PRDW, 2020) and the applicable guidelines, using the precautionary principle in cases where marine water quality guidelines for these constituents are not clear.*
		
		*The **preferred specific alternative locations** for the discharge of the various effluent streams are three separate servitudes comprising:*
		• *Discharge servitude 1:*
		  ○ *Cooling water effluent discharge servitude 200 m wide to a distance of 650 m offshore and a depth of -11 m CD.*
		• *Discharge servitude 2: Combined effluent discharge servitude 200 m wide with the following:*
		  ○ *Brine discharge 1,000 m offshore, at a depth of -13.5 m CD.*
		  ○ *Finfish aquaculture recirculation system effluent discharge 1,500 m offshore, at a depth of -16 m CD.*
		  ○ *Wastewater discharge from Phase 2 of the WWTW at 3,000 m offshore, at a depth of -20 m CD.*
		• *Discharge servitude 3:*
		  ○ *Abalone aquaculture flow-through system effluent discharge servitude 100 m wide into the surf zone.*

I&AP	COMMENT	RESPONSE
		Both the revised Dispersion Modelling Report (PRDW, 2020) and the Ecological Risk Assessment conducted by Lwandle Technologies (Pty) Ltd, was made available to SANParks for review and comment.
SANParks – Anè Oosthuizen	Nothing mentioned about monitoring the quality of the effluent after discharge or environmental impacts? This should certainly be the responsibility of the CDC as developer? Design and implementation should be scientifically rigorous.	Noted and agreed. Monitoring and compliance will be handled via the Coastal Waters Discharge Permit (CWDP) process. The Coega Development Corporation will be accountable for monitoring of effluent at the 'end-of-pipe' at in the marine environment. The EIA and CWDP application will include a monitoring plan. **A Draft Coastal Waters Discharge Permit (CWDP) application (as required by Section 69 of the NEM: Integrated Coastal Management Act No. 24 of 2008 for discharge of effluent into the marine environment) will be submitted to the DEA: Oceans and Coasts. Certain conditions, inclusive of monitoring will be included in the permit issued by Oceans and Coasts. In addition, monitoring information will be included in the EMP drafted as part of the EIA Application.*
SANParks – Anè Oosthuizen	Water quality in Algoa Bay should not be allowed to decline and impact on the environment, tourism, recreational activities or the fishing industry.	Noted and agreed. The EIA process and marine specialist studies are being designed using the precautionary principle. The sensitivity of the marine environment and location of sensitive habitats and beneficial users are recognised, and have been mapped in the marine dispersion model and impact assessment. The dispersion models look at the movement and extent of the effluent discharge plume in relation to sensitive environments, and consider effluent quality at the edge of the RMZ of the plume in relation to the water quality standards of the receiving environment. **The revised modelling results (Dispersion Modelling undertaken by PRDW in 2020) indicates the following:* • *Abalone surf zone discharge: Effluent gets trapped within the surf zone, however effluent from abalone meets the required South African Water Quality Guidelines (DWAF, 1995) and no further dilution is required.* • *Wastewater river discharge: Effluent from Phase 1 of the proposed WWTW, discharged into the Coega River and then into the Port of Ngqura results in low dilutions due to the stagnant river conditions and plume buoyancy. Plume is entrapped within the Port. None of the water quality guidelines are met for this option. As such it is recommended that land-based water treatment occurs prior to river discharge.* • *Wastewater with diffuser at 20 m depth: Effluent from Phase 2 of the proposed WWTW, discharged via a pipeline at -20m, with a diffuser, achieved high dilutions. All water quality parameters with the exception of metals and COD*

I&AP	COMMENT	RESPONSE
		were met. Effluent constituents at discharge must be treated so that they are not acutely toxic after discharge. As such it is recommended that land-based water treatment occurs prior to discharge into the marine environment to ensure that all water quality parameters are in line with the South African Water Quality Guidelines. • *Finfish with diffuser at 16 m depth: Effluent from finfish farms, discharged via a pipeline at -16m, with a diffuser, achieved high dilutions. The required Water Quality Guidelines are met within 300 m of end-of-pipe.* • *Brine with diffuser and high jet velocity: Modelling conducted found that the discharge achieved moderate dilutions and that the required Water Quality Guidelines are met within 300 m of end-of-pipe.* • *Cooling and heating water with diffuser at 10 m depth: Modelling conducted found that the discharge achieved moderate dilutions despite the high flow rate of water and that the required Water Quality Guidelines are met within 300 m of end-of pipe.* *Based on the above it is clear that with adequate mitigation measures, such as land-based treatment in place, it is not likely that the water quality within Algoa Bay will deteriorate as a result of the implementation of this project.*
SANParks – Anè Oosthuizen	SANParks will be able to give more detailed comment once all the modelling studies have been completed	Thank you. We will arrange a workshop with SANParks to discuss outcomes of the midfield model. ** In 2016 PRDW undertook marine effluent dispersion modelling for 12 potential discharge scenarios, to inform the movement of the discharge plumes and possible interactions with planned abstraction points (PRDW, 2016). PRDW has modelled additional scenarios in 2020 based on the updated effluent characterisation and refined intake and outlet locations obtained from the results of the previous modelling exercise. In addition, as part of wider assessments on the proposed marine pipeline servitude, PRDW contracted Lwandle Technologies (Pty) Ltd (Lwandle) to conduct an ecological risk assessment of the effects on the receiving environment. This report provides the environmental context in which the proposed discharges will operate based on existing survey information and scientific publications, specify receiving water quality guidelines that should apply in the water body, define mixing zone dimensions where effluent constituent chronic toxicity levels may exceed water quality guideline thresholds, and conduct toxicity effects evaluations on predicted effluent constituent distributions in the receiving environment of the discharges. The report produced by Lwandle should be read in conjunction with the PRDW (2020)*

I&AP	COMMENT	RESPONSE
		report: Marine Pipeline Project for the Coega Special Economic Zone, Marine Effluent Dispersion Modelling, PRDW Report No. S2001150-CE-001-R1, which provides the simulation modelling on which the interpretations and findings of the current report are based. These reports have now been finalised and are appended to this Final Scoping Report as Appendix 5 & 6. Both the 2020 PRDW Dispersion Modelling Report and the Ecological Risk Assessment undertaken by Lwandle was submitted to SANParks via e-mail on the 8th of December 2020. The comments received from SANParks on the 15th of December 2020 includes their comments on these specialist reports. The comments are included and responded to in the sections below relating to the current application.
Aurecon – Margaret Lowies	No major concerns apart from potential impacts on NMBM infrastructure requirements.	**The project is unlikely to place additional stress on the NMBMs infrastructure requirements. In fact, the project may result in the alleviation of these impacts as a result of the following:* • *Allowances are made for the discharge of effluent from an additional wastewater treatment works.* • *Allowances are made for the discharge of brine from a desalination plant that will in essence supply freshwater to industry within the Coega SEZ thereby reducing the overall demand for freshwater from the NMBM.* • *Allowances are made for the discharge of cooling / heating water from the power stations and LNG Hub. This will result in increased power to the national grid that in turn could alleviate the current power situation within the NMBM.*
Aurecon – Margaret Lowies	**S 1.3.3 p. 12**, first bullet point, last sentence: "*The EIA will also assess impacts associated with construction of infrastructure required for discharge by various industries in the servitude*." Please consult with Aurecon on the aforementioned to ensure that the EIA gives an accurate representation of possible pipeline infrastructure envisaged for the WWTW marine discharge in order to eliminate the need for an additional EIA at a later stage.	Possible alternatives for land-based infrastructure have been sent to Aurecon and others for comment. Workshops will be held with consultants handling the EIA process for the planned Coega WWTW, CCGT plant and ADZ plant once results of the midfield model and land-based specialist studies are available to finalise a way forward for positioning of servitudes and to share information on infrastructure requirements and plans. To note – this EIA will determine the preferred position of land-based servitudes to transfer seawater from the marine abstraction servitude to the Zone boundary of respective industries, and transfer treated effluent from the Zone boundary of respective industries to the marine discharge servitude. Further, it will assess impacts associated with construction of infrastructure within the servitudes. However, the EIA will not include detailed engineering designs of the infrastructure needed by various industries – this will need to be done by each investor as part of their planning processes. With this in mind, this EIA will not be able to assess certain specific impacts where detailed designs are required; but will rather make broad recommendations for future consideration. Further, the CDC will

I&AP	COMMENT	RESPONSE
		not be responsible for constructing infrastructure from the Zone boundaries of various industries to the marine servitudes. **Please note that this EIA includes the discharge infrastructure for the WWTW only. A separate EIA process will need to be undertaken for the construction of a WWTW should the NMBM still go ahead with this project.*
Aurecon – Margaret Lowies	**S 1.3.3 p. 12**, third bullet point: "*Recommend the position of a landward servitude for the establishment of infrastructure required to transfer abstracted seawater from the marine servitude to respective industries and to transfer effluent from respective industries to the marine discharge servitude. The servitude and required infrastructure will extend from the Zone boundary in which the respective industries are situated to the marine discharge and abstraction servitudes*." Kindly advise Aurecon at the earliest once the landward servitudes for infrastructure has been identified. The position of the connection point at the zone boundary might have significant cost implications to the NMBM and require the authorisation of additional listed activities under NEMA and NEM: ICMA.	Possible alternatives for land-based infrastructure have been sent to Aurecon and others for comment. Workshops will be held with consultants handling the EIA process for the planned Coega WWTW, CCGT plant and ADZ plant once results of the midfield model and land-based specialist studies are available to finalise a way forward for positioning of servitudes and to share information on infrastructure requirements and plans. To note – this EIA will determine the preferred position of land-based servitudes to transfer seawater from the marine abstraction servitude to the Zone boundary of respective industries, and transfer treated effluent from the Zone boundary of respective industries to the marine discharge servitude. Further, it will assess impacts associated with construction of infrastructure within the servitudes. However, the EIA will not include detailed engineering designs of the infrastructure needed by various industries – this will need to be done by each investor as part of their planning processes. With this in mind, this EIA will not be able to assess certain specific impacts where detailed designs are required; but will rather make broad recommendations for future consideration. Further, the CDC will not be responsible for constructing infrastructure from the Zone boundaries of various industries to the marine servitudes. **Please note that this EIA includes the discharge infrastructure for the WWTW only. A separate EIA process will need to be undertaken for the construction of a WWTW should the NMBM still go ahead with this project.*
Aurecon – Margaret Lowies	**S 1.5.2 p. 18**: Aurecon confirms that the current scope of work for the WWTW includes potential supply of treated effluent to tie into the NMBM return effluent supply scheme.	Noted **There is currently no EIA being undertaken for the proposed WWTW located within the Coega SEZ. Should the NMBM decide to proceed with this project, a separate EIA process will need to be undertaken for this.*
Aurecon – Margaret Lowies	**Appendix 5**:	The nearfield model considered 12 discharge scenarios from 4 discharge positions. A number of scenarios were identified where water quality requirements are met at the edge of the RMZ. The next step is to do a midfield model where the same scenarios will be tested (i.e. there are no preferred options at this stage, only a number of potentially acceptable options). A preferred discharge scenario and position will be identified taking into account impacts on the natural marine

I&AP	COMMENT	RESPONSE
	The nearfield model refers to a "worst case" scenario with Table 4.2 indicating the discharge infrastructure and depth requirements to meet WQG values at the edge of RMZ. It is currently understood from the nearfield modelling results that an eastern or western breakwater discharge at a 16m depth with 10 diffusers (Options 1a and 4a) is recommended by Anchor. The recommendations have a significant impact on the CAPEX and OPEX implications should the NMBM decide to construct a marine outfall at some stage. It is therefore crucial that the recommendations are backed by solid data or that the limitations of the model and methodology used are clearly indicated. The main concern is that the NMBM will be bound to meeting specific design criteria based on a "worst case" scenario approach which discounts the fact that the WWTW will be discharging effluent at a much better quality for the majority of its operational lifespan.	environment and beneficial users, costs to construct, engineering designs etc. The concern w.r.t. prohibitive costs of certain discharge scenarios, along with other factors such as maintenance in operational phase is noted. Further we understand that the intention is to construct and operate a WWTW that will meet certain design standards that should ideally not impact on the receiving environment. However, this EIA and the marine dispersion models have to look at worst case scenario to determine where the servitudes must be placed, and what the discharge parameters must be in the event of worst case happening. **It should be noted that the location of the discharge servitude west of the Port was identified as **'not viable'** for the construction of the proposed servitude for the following reasons:* • *Effluent will need to be pumped around the perimeter of the Port (a distance of about 12 km) which would result in significantly higher capital and operational costs compared with an eastern discharge.* • *Although the required dilutions can be achieved, discharges west of the Port at -10 m will enter the Port, which increases the risk of accumulation of particulates with associated nutrients and heavy metals. If the pipeline is extended to -16 m, the achieved dilutions reduce the risk of effluent entering the Port. However, there is still a risk of accumulation of particulates with associated nutrients and heavy metals.* *Based on personal communication with the Economic Specialist, the cost of constructing a discharge servitude from the ADZ to the western side of the Port will probably make the project financially unfeasible. This will result in each investor having to construct their own independently dedicated discharge servitude which could have a greater environmental negative impact on Algoa Bay. An economic assessment is currently in process to confirm this finding and will be submitted as part of the EIA documentation.*

I&AP	COMMENT	RESPONSE
Aurecon – Margaret Lowies	With reference to the abovementioned, could you kindly confirm the period of discharge at "worst case" concentrations for Ammonia, TSS and *E. coli* was modelled for? I.e. is the model assuming an indefinite malfunctioning of whichever industry's effluent pre-treatment or treatment processes or is the model limited to a certain timeframe of discharge of "raw" or "untreated" effluent? Linked to the aforementioned, if you could kindly confirm whether a dispersion model was done/will be done for long term discharge of different industry effluents under normal operating conditions i.e. meeting the requirements of CMC and CCC under typical conditions on not "worst case" scenarios only. **Section 6, p. 41, first paragraph**: "A prerequisite for industrial effluent is that it may not contain harmful chemicals, trace metals or other substances that exceed GDA standards (personal communication with CEN). This is due to the vast number of pollutants that are likely to occur in this type of combined effluent as well as the uncertainty of industries that will discharge into the servitude. Meeting this requirement will also protect against damage to WWTW bacterial treatment processes should industrial effluent be received and treated by the Coega WWTW." The Coega WwTW will allow for metal and oil removal as part of the Industrial train. It is currently envisaged that industries will have to comply with the current NMBM effluent bylaw standards in order to be allowed to discharge to the WwTW. Effluent quality cannot be dictated by the General and Special limits as per the General Authorisation of 2013 (GN 665 of 2013) as the GA is only applicable to a discharge volume of 2 Mℓ p/d and excludes marine outfalls and complex industrial wastewater. It is therefore critical to quantify the allowed	The nearfield model is based on worst-case scenario effluent, and does not differentiate between different states over time. (e.g. 'expected' effluent parameters were not modelled as the norm in the long-term in operational phase) – a precautious approach was taken so that the model could inform the position, design etc. of the discharge servitude in the event of the worst-case scenario happening as this is largely an unpredictable event that can only be detected once it has already happened. The midfield model that is currently underway will include a scenario where 'expected' effluent parameters are modelled. The EIA will then compare the outcomes of this scenario with the worst-case option and determine the most feasible and risk-averse alternative going forward. Industries discharging to WWTW would need to meet NMBM by-law standards prior to raw effluent entering the works. The midfield model will determine what standards the WWTW (and other industries) effluent should meet prior to discharge via the marine servitude. The receiving water quality objectives approach was followed in the nearfield model where standards for the Natural Environment as per DWA Guidelines (1995) were used – this dictates quality that the edge of the RMZ must comply with and was selected because they are the most stringent standards **As per response from CEN above.*

I&AP	COMMENT	RESPONSE
	contaminant concentrations (specifically metals) by means of a different set of guidelines (e.g. DWAF 1995 guidelines) or actual data collected from the study area. Due to the complex nature of effluent to be treated at the WwTW it is crucial that the design team is aware of the exact allowable concentrations of inorganic pollutants as it has a significant implication in terms of the process design for the WwTW. Please inform Aurecon when the mid-field modelling has been completed and provide a copy of the results when available (if permissible)	
Aurecon – Johan van der Mescht	The width of the outfall/intake servitude on land; The location of the marine outfall/intake corridor	Noted, thank you. These queries will be addressed and reported on at EIA stage. **The land-based seawater intake and effluent discharge pipeline reticulation will comprise HDPE pipes with diameters ranging between 600 mm to 3000 mm. Various pump stations and booster stations will be constructed along the route of the pipeline reticulation. Alignments and preferred positions will be finalised at EIA stage with input from design engineers to advise on aspects such as topography, pumping requirements, costs, flow rates etc.* *The width of the land-based infrastructure servitude is anticipated to be 30 m.* *The location of all infrastructure is shown on Figure 2.12 in Chapter 2 of this document.*
MTU South Africa (Pty) Limited – Charl de Jager	Provided a document with a 'needs list' for the planned Gas to Power project.	Details regarding seawater abstraction and discharge requirements were provided to PRDW for consideration in the midfield marine dispersion model. **The Gas to Power project is subject to four separate EIA processes currently being undertaken by SRK. For any further information related to this project kindly please contact the relevant project manager, Ms Nicola Rump (NRump@srk.co.za).*
Discovery Health - Ellian Peterson	If the proposed project is approved, what impact will it have on the rest of the IDZ?	The project entails the establishment of a marine-based servitude in which current and future investors in the IDZ can establish infrastructure for the abstraction of seawater as required by their processes (e.g. for cooling, desalination, aquaculture) and/or discharge of treated effluent to the marine environment. Land-based infrastructure will also be needed to transfer treated effluent from the respective industries to the marine discharge servitude and to bring water from the sea to the industries.

I&AP	COMMENT	RESPONSE
		** The primary need for the provision of integrated marine servitudes is to facilitate the co-ordinated development of infrastructure for a number of possible investors in the Coega SEZ that would require seawater in their process and/or that need to discharge treated effluent. The types of industries that would use seawater include those that would use seawater for cooling processes (such as power plants), aquaculture facilities and desalination plants. The Coega SEZ is currently the largest SEZ in the Southern Hemisphere and is adjoined by a deep water harbour (Port of Ngqura). According to the NMBM SDF (2015) the Coega SEZ, under the stewardship of the CDC, has managed to attract billions in investments into the economy of the Eastern Cape and thus enabling thousands of jobs to be created. In addition, a number of large projects valued at over R75 billion, are currently on the horizon. According to the Eastern Cape Provincial Spatial Development Plan (2017 Final Draft), the Coega SEZ is one (1) of only two (2) in the Province and as such is seen as having significant growth potential which requires provincial attention. Having the appropriate infrastructure available to investors will enhance the attractiveness of the Coega SEZ as an investment destination and therefore future investment trends. This will result in the provision of revenue, foreign exchange, taxes and royalties. An increase in investment into the area will also result in employment, local economic development, skills development, and local procurement.*
Discovery Health - Ellian Peterson	Will the electrical infrastructure be impacted? Municipality supply affected during and after the project?	The EIA process includes the assessment of impacts of construction of the required land-based infrastructure from the marine servitudes to the boundary of Zones that require these services. To this end, the EIA process will identify an area in the IDZ in which land-based infrastructure can be established. The Scoping Report includes a desk-top sensitivity study of areas that should be avoided. A mid-field dispersion model will be done that will ultimately inform the position of the marine servitudes. Once this has been done, the land-based specialist studies can commence to finalise the position of the land-based servitude. In the process, cognisance will be taken of impacts on existing infrastructure and facilities in the IDZ. Conflicts with existing land uses, roads and infrastructure will be avoided as far as possible. It should be noted that infrastructure for various industries will come on line based on demand – i.e. as and when they develop. Municipal supply should not be affected by the project since use will be made of seawater, and discharge will be to the marine environment. ** The largest volumes of seawater are required for the cooling of two proposed 1,000 MW water-cooled power plants in Zone 10 of the SEZ, which will enable the CDC to provide tenants with a secure access to energy and contributes to the overall energy*

I&AP	COMMENT	RESPONSE
		security of South Africa. The NMBM (through Eskom) supplies electricity to over 297 000 customers in the NMBM area, and has an annual turnover of approximately R1.8 billion. Eskom supplies an incoming voltage of 132 kV which is then distributed to industrial, commercial and residential consumers. Due to the growing population the need for basic services such as electricity continues to increase, and thus the backlog is also increasing. As such there is a need to improve, upgrade and provide additional electricity to the region. In order to achieve universal access to electricity, grid and non-grid technologies have to be implemented in line with the National Energy vision that "more than 90 percent of the population should enjoy access to grid-connected or off-grid electricity within 20 years", as well as to implement any other possible technologies based on cost-effective options in order to address current and future backlogs.
Mamjoli Marine Enterprise (Pty) Ltd - Mxoleli Nkuhlu	Interested in the project with relevance to the Aquaculture Development Zone (ADZ). Requested to be added to this EIA and the ADZ EIA public participation database.	Noted. Details added to the PPP database for this EIA as well. **Mamjoli Marine Enterprise has been included in the revised list of I&APs.*
SAHRA - Lesa la Grange	Requested that the SAHRIS case ID for the application be sent so that a case officer can be assigned to the project.	Case number sent to SAHRA - the Case ID number is 10174 **The Draft Scoping Report as well as the Final Marine Heritage Assessment, was submitted to SAHRA via their online platform. Comments received by SAHRA has been included below under the sections related to this application (proof included in Appendix 1: Public Participation Process). The marine heritage assessment submitted to SAHRA is available as Appendix 7 to this report.*
Matthew Hills – NMBM (query raised at public meeting)	Who owns marine land? Will measures be considered in the design of the abstraction infrastructure w.r.t. entrainment of organisms for example, related to maintenance and clogging	Coastal waters/land and the marine environment is owned by citizens. Coastal public property includes several components such as coastal waters and land below coastal waters, islands, the seashore, and other state land (e.g. the Admiralty Reserve). Ownership of coastal public property vests in the citizens of South Africa, however the State is the trustee on behalf of all citizens. The intention of this zone is to prevent exclusive use of the coast by facilitating access to, and sustainable use of productive coastal resources for the benefit of all South Africans (Celliers *et al.*, 2009) Yes, this will be included under the mitigation of impacts in the EIA report. **As per CEN response included above.*

I&AP	COMMENT	RESPONSE
Christina Hagen – BirdLife South Africa	I would like to register as an I&AP for this project please. Please can you also let me know where in the process the project is and if there are any commenting opportunities	Registered and details added to the IAP database. Sent copy of Executive Summary of DSR and link to download full report. Noted that the commenting period ended on 1 March, but that comments could still be submitted by 7 March. **Christina Hagen has been included in the revised list of I&APs.*
COMMENTS RECEIVED FOLLOWING THE NOTIFICATION OF THE SUBMISSION OF AN APPLICATION FOR EA TO ALL I&APS ON THE 27TH OF JULY 2020		
David Louw Cerebos davel@cerebos.co.za	Hi Nicole Please could you include me as an I&AP for the project involving Coega seawater extraction / effluent return, as a representative of Cerebos. My contact details are in my signature below.	Dear Mr Louw, Thank you for contacting us. Please note that you are now registered as an Interested and Affected Party (I&AP) on the proposed project. As a registered I&AP, you will receive notifications of when the project reports are available for public review and comments as well as how to access these reports. **Cerebos remains a registered interested and affected party on this project.*
Schalk Potgieter Director: Strategic Planning and Policy Formulation SPotgiet@mandelametro.gov.za	Morning Please register as I&AP	Dear Mr Potgieter, Thank you for contacting us. Please note that you are now registered as an Interested and Affected Party (I&AP) on the proposed project. As a registered I&AP, you will receive notifications of when the project reports are available for public review and comments as well as how to access these reports. **Schalk Potgieter remains a registered interested and affected party on this project.*
COMMENTS RECEIVED FOLLOWING THE NOTIFICATION OF THE AVAILABILITY OF THE DRAFT SCOPING REPORT FOR PUBLIC REVIEW (PREVIOUS APPLICATION RELEASED IN JULY 2020)		
Simon Wijnberg CEO – Impact Free Water simon@impact-freewater.com	Dear Nicole, Thanks for this – please can you add neil@impact-freewater.com to the mailing list. Thank you.	Good morning Simon, Thank you for contacting us. Please note Neil has been added to our I&AP database and is now registered as an Interested and Affected Party (I&AP) on the proposed project. The email notification was subsequently forwarded to Neil **Simon Wijnberg remains a registered interested and affected party on this project*
Christelle du Plessis Habitat Link (Coega ECO)	Hi Nicole Kindly register me as an I&AP as CDC's independent ECO for the SEZ.	Good afternoon Christelle, Thank you for contacting us. Please note that you have been included in the database for this project as the CDC's independent ECO.

I&AP	COMMENT	RESPONSE
christelle@habitatlink.co.za		**Christelle du Plessis remains a registered interested and affected party on this project*
Christelle du Plessis Habitat Link (Coega ECO) christelle@habitatlink.co.za	Morning Nicole Yes, I did manage to download the document. Thanks very much.	Good afternoon Christelle, I trust you are well. I would just like to confirm whether you have been successful in accessing the Draft Scoping Report for the Coega Marine Intake and Outfall Infrastructure Project?
Ane Oosthuizen National Marine Co-ordinator Park Planning & Development South African National Parks Ane.Oosthuizen@sanparks.org	HI Nicole Thank you for the reminder. Please register me as I&AP for the EIA. Kind regards	Good afternoon Ane, Thank you for your email. Please note that you have been included as an Interested and Affected Party (I&AP) on the database for this project. **SANParks remains a registered interested and affected party on this project*
Patrick Nodwele NMBM pnodwele@mandelametro.gov.za	Hi Nicole, We received your email, for future correspondence kindly copy Ms Buyiswa Deliwe (bhumani@mandelametro.gov.za) and Kobus Slabbert kslabbert@mandelametro.gov.za as well. Regards, Patrick	Good afternoon Patrick, Thank you, noted. ** Patrick Nodwele remains an I&AP on the proposed project*.

I&AP	COMMENT	RESPONSE
DEFF	The Department noted the use of the word “may” when describing the project activity that triggers the listed activities applied for. The use of the word “may” shows that the EAP/applicant is not confident and/or uncertain as to why the listed activities applied for are being triggered by the proposed activity. You are therefore requested to rephrase all project activity descriptions to refrain from the use of the word “may”. The onus is on the applicant and the appointed environmental assessment practitioner to ensure that only the applicable listed activities are included in the application. An amended application form must be submitted.	The listed activities have been amended in both this Final Scoping Report and the application form. An amended application form has been uploaded to the DEFF online system. **The listed activities have been further amended. The listed activities within the revised Scoping Report correspond to those submitted to the DEFF in the application form.*
DEFF	Please ensure that all relevant listed activities are applied for, are specific and that it can be linked to the development activity or infrastructure as described in the project description. The details such as the capacity of the off-stream storage of water, including dams and/or reservoirs must be included in the project description.	The listed activities have been amended in both this Final Scoping Report and the application form. An amended application form has been uploaded to the DEFF online system. The Listing Notice GNR983 Activity 13 have been removed from the application as the storage of seawater (maximum capacity 7,605,000 ML) has been approved as part of the Aquaculture project (EA 14/12/16/3/3/3/214). **The listed activities have been further amended. The listed activities within the revised Scoping Report correspond to those submitted to the DEFF in the application form.*
DEFF	The EAP is urged to revisit the applicability of the listed activities as the applicability of some of the listed activities is questioned. The following questions must be addressed as the basis for providing guidance on whether or not the proposed activity is triggered. “Does the proposed development trigger all the below mentioned infrastructure? Does the proposed development increase the proposed footprint of the harbour? Special attention must be given to the exclusion clauses. An example of such an activity is Activity 17 Listing Notice 1 of GNR 983.	The listed activities have been amended in both this Final Scoping Report and the application form. An amended application form has been uploaded to the DEFF online system. **The listed activities have been further amended. The listed activities within the revised Scoping Report correspond to those submitted to the DEFF in the application form.*

I&AP	COMMENT	RESPONSE
DEFF	If the activities applied for in the application form differ from those mentioned in the Final SR, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link https://www.environment.gov.za/ documents/forms.	The listed activities have been amended in both this Final Scoping Report and the application form. An amended application form has been uploaded to the DEFF online system. **The listed activities have been further amended. The listed activities within the revised Scoping Report correspond to those submitted to the DEFF in the application form.*
DEFF	Please ensure that the final SR includes a legible site layout map; and environmental sensitivity map indicating all environmental sensitive areas and features, a map combining a layout map superimposed (overlain) on the environmental sensitivity map, and a regional map of the area.	The site layout map superimposed on both terrestrial and marine based sensitive sites is included as Figure 2.10. A locality map, including the regional context have been included as Figure 2.1. **The site layout map superimposed on both terrestrial and marine based sensitive sites is included as Figure 2.21.* *A locality map, including the regional context has been included as Figure 2.2.*
DEFF	Google maps will not be accepted.	No google maps have been included in the FSR. **As above*
DEFF	The plan of study, page 102 of the DSR indicates that the fundamental alternatives of the development other than the proposed infrastructure are technically not feasible in this instance and that no design/layout, technology and/or operational alternatives will be assessed for the proposed development as all options mentioned in the project description will require authorisation. This is noted, however, this information must be presented in such a way that the reasoning is clear and can be followed in order to enable the decision maker to adequately apply his/her own mind to the considerations and to follow the argument. Gaps, uncertainties and assumptions must be clearly reported and the decision in terms of the preferred alternatives must be appropriate considering the gaps, uncertainties and assumptions and the need for a risk averse and cautious approach.	A revised table comparing all site and layout alternatives has been included in the report as Table 2.2. **The alternatives section (Section 7.1) included in the Plan of Study has been substantially revised in order to make it more clear and concise. This section includes a table (Section 7.1.1) indicating gaps, uncertainties and assumptions.*

I&AP	COMMENT	RESPONSE
DEFF	Please ensure that all issues raised and comments received during the circulation of the DSR from registered I&APs and organs of state which have jurisdiction (including this Department's Biodiversity Section, Oceans and Coasts) in respect of the proposed activity are adequately addressed in the Final SR. Proof of correspondence with the various stakeholders must be included in the Final SR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. The public participation process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014, as amended.	Comments on the content of the Draft Scoping Report were only received from DEFF and SANParks. These comments have been addressed in the IRT and amendments to the DSR have been made and included in the FSR accordingly. Additional comments received during the mandatory 30-day Public Review Period were limited to requests to register as I&APs. All I&APs were notified of the availability of the DSR via email and SMS notification. I&APs were also contacted via telephone on the 10th of August to confirm the receipt of the DSR for review. Please refer to Appendix 1 for proof of all correspondence with I&APs. **All comments received to date (including historical comments) have been included in this IRT and are responded to by the EAP. All evidence of correspondence is included in Appendix 1 of this report.*
DEFF	A comments and response trail report (C&R) must be submitted with the final SR. The C&R report must incorporate all historical comments for this development. All comments from I&APs must be adequately responded to. Please note that a response such as noted is not regarded as an adequate response to I&AP comments.	A comments and Response report has been included in the FSR (this table). Additionally, historical comments received during the previous Scoping phase of this development are included in Appendix 1. Proof of email notification and I&AP comments received are included in Appendix 1. **A comments and response report has been included in the FSR (this table). This includes historical comments received during the previous two Scoping phases of this development. Proof of email notification and I&AP comments received are included in Appendix 1.*
DEFF	The final SR must provide evidence that all identified and relevant competent authorities have been given the opportunity to comment on the proposed development; the Eastern Cape Environmental Department, the District and Local Municipalities.	All I&APs were notified of the availability of the DSR via email and SMS notification. Additionally, I&APs were also contacted via telephone on the 7th and 11th of August to confirm the receipt of the DSR for review. Please refer to Appendix 1 for proof of all correspondence with I&APs. **All I&APs were notified of the availability of the DSR via email and SMS notification. Please refer to Appendix 1 for proof of all correspondence with I&APs.*
DEFF	Given the background to this application, that the previous application lapsed due to the fact that additional specialist studies were to be undertaken because of the unexpected variance in the results of the draft midfield model in comparison to the nearfield model presented in the DSR, as well as	Midfield Marine Dispersion Model: Marine Dispersion modelling was undertaken for the proposed project in July 2017. In addition to this study the CDC has commissioned further marine dispersion modelling in order to address comments raised by stakeholders on the results of this modelling as well as to further refine the location of proposed infrastructure. Preliminary results of this modelling were presented at the ELC meeting held in

I&AP	COMMENT	RESPONSE
	queries raised by the project team and the authorities on the draft midfield modelling results. This necessitated the expansion to the scope of works of the EIA and associated specialist studies which outcome could not have been anticipated prior to undertaking the midfield model. The following additional specialist assessment were to be done after the Scoping Phase. These additional studies were the main reason for the delays in the submission of the Draft Environmental Impact Assessment (DEIAR) to the Department, which led to the lapsing of the application. A midfield marine dispersion model to refine the outcome of the near and far field models presented in the FSR and ultimately determine the preferred position of the marine and abstraction servitude(s) A marine Archaeological Study A Terrestrial and Aquatic Specialist Study of the terrestrial environment A paleontological specialist study of the terrestrial environment	August 2020 and the final report will be submitted to the department in conjunction with the Draft EIR. The terms of reference of this study is included in the Plan of Study (Section 7.3.6) **The completed studies are appended as Appendix 5&6.* A Marine Archaeological Study is currently underway. The terms of reference for this study has been included in Section 7.3.1 of the Plan of Study. **The completed study is appended as Appendix 7.* A terrestrial ecological assessment is currently underway. The terms of reference for this study has been included in Section 7.3.5 of the Plan of Study. The Coega Development Corporation (CDC) appointed Scherman Colloty & Associates (SC&A) to assess and delineate all wetlands located within the Coega SEZ in September 2016. This study identified three wetlands within Zone 10 of the SEZ, none of which are situated within 500 m of the proposed development, except the Coega River/Estuary (port). As per the NFEPA (2011) spatial data set (please see Figure 4.3 under Section 4.2.2: Surface Hydrology), the artificial wetland located along the coast, in the centre of the proposed development, is the now defunct Marine Growers abalone facility. Additionally, it should be noted that no wetlands were observed during the site survey conducted by the ecological specialist. A section on this (inclusive of mapping) has been included in Section 7.3.7. An Archaeological and Cultural Heritage Assessment was conducted for the SEZ in 2010. The CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. These recommendations are included in the impact assessment included below and will be included in the EIA and Construction EMPr. It should be noted that we are aware that generally specialist studies should not be older than 5 years, however, heritage, archaeological and palaeontological artifacts are sessile and thus the position of these do not change over time, as such it is considered acceptable to utilise the existing study as the status quo would not have changed. A section on this (inclusive of mapping) has been included in Section 7.3.8. **As above* *The full procedure currently being implemented by the CDC in the management of its heritage resources is as follows:*

I&AP	COMMENT	RESPONSE
		1. *National Heritage Resources Act, 25 of 1999. Section 35(4) states that no person may, without a permit issued by the responsible heritage resources authority –* *(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;* *(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;* 2. *It is in fulfilment of this Act that the CDC conducted its Phase 1 Heritage Impact Assessment (HIA).* 3. *The recommendations from the HIA have been incorporated into the CDC's Operational Environmental Management Plan (OSHEMP), as approved by the DEFF. Section 4.13 of CDC's approved OSHEMP sets out the requirement for the protection of heritage resources in the SEZ.* 4. *The recommendations from the CDC's OSHEMP have been incorporated into the CDC's Project Environmental Specification (PES) for Construction, for each project. Section 5.19 of the PES for Construction sets out the specification for the appointment of heritage specialists to ensure the OSHEMP and PES is implemented, as described below:* ***Protection of archaeological and palaeontological sites within the SEZ*** *The CDC conducted a Phase 1 Heritage Impact Assessment (HIA) for the Coega SEZ. The HIA was in fulfilment of Section 38 of the National Heritage Resources Act, 1999. The HIA comprised of 3 separate specialist impact assessments:* *a) Scoping & Phase 1 archaeological impact assessment for the Coega SEZ, with recommendations;* *b) Scoping & Phase 1 palaeontological heritage impact assessment for the Coega SEZ with recommendations;* *c) Assessment of the Built Environment in the Coega SEZ, with recommendations for the preservation of identified grave sites and buildings of conservation value; i.e. older than 60 years.* *In collaboration with the South African Heritage Resources Agency (SAHRA), management guidelines were generated for each of the 14 Zones within the Coega SEZ, outlining the sensitivity of each Zone and proposing guidelines which must be followed prior to and during any development within each Zone. These management guidelines, together with the findings of the three impact assessments, constitute the CDC's Heritage Management Plan (HMP) for the Coega SEZ, which must be complied with by all contractors in the SEZ.*

I&AP	COMMENT	RESPONSE
		The contractor must ensure that an archaeologist and palaeontologist are appointed to implement the CDC's Heritage Management Plan for the Coega SEZ. The following are the minimum requirements for the implementation of the HMP: 1. *An archaeologist must inspect the Site once bush clearing has taken place, and monitor the Site during topsoil removal and trenching activities to allow for the documentation and/or rescue of any new archaeological discoveries;* 2. *A palaeontologist must inspect the Site once bush clearing has taken place and during deep (> 3m depth), high-volume trenching activities while fresh bedrock is still exposed;* 3. *In the event that a significant cultural site, archaeological deposit or palaeontological site is found, the archaeologist and/or palaeontologist, in collaboration with the CDC, must engage SAHRA and ECPHRA, to determine the requirement for cultural, archaeological and/or palaeontological mitigation;* 4. *All reporting to be done in terms of the NHRA and its Regulations.*
	The Department is concerned that the Plan of Study does not include all of the "additional" specialist studies mentioned above. The Department still considers these to be relevant to the proposed development.	Please refer to comments included on specialist assessments above. **As above*
DEFF	The DSR on page 2 indicates that the "*The position of the discharge servitude, depth of discharge, and design of discharge infrastructure will be determined via a dispersion modelling process and engineering studies".* The Department is of the opinion that these specialist studies were conducted already since these were conducted as part of a previous application. It is quite concerning that these specialist studies were not included in the DSR phase to give I&APs as well as the EAP enough time to address the challenges previously encountered.	Additional dispersion modelling has been conducted based on comments received from previous applications for this project. The preliminary results of this additional modelling were presented at the ELC meeting held in August 2020, however the reports are not yet available (i.e. have not be completed) for inclusion into the DSR and distribution to the I&APs. Based on the preliminary results, marine effluent discharge will be conducted as follows: • Cooling and Heating water discharge via a tunnel (to accommodate large flows from once through cooling) to – 11 m CD, 650 m offshore • Brine discharge via a pipeline to -13.5 m CD, 1000 m offshore • Finfish discharge via a pipeline to -16 m CD, 1500 m offshore • Wastewater from phase 1 of the WWTW via the Coega River into the Port • Wastewater from phase 2 of the WWTW via a pipeline to – 20 m CD, 3000 m offshore • Abalone discharge via pipeline into the surf zone.

I&AP	COMMENT	RESPONSE
		The final marine dispersion modelling reports will be submitted to all I&APs for review with the Draft EIR and the final results will be incorporated into the EIR for review. The relevant edits as outlined above has been made to the text in the project description included in the FSR. **As above. The marine dispersion modelling, environmental risk assessment and marine heritage assessment has now been completed and the reports have been received from the relevant specialists, as such these have been appended to the FSR as Appendices 5, 6 and 7. The marine dispersion modelling and environmental risk assessment report were circulated to SANParks (upon request), as such comments received from SANParks are addressed in the relevant sections below includes comments on these reports.*
DEFF	Please note tha the specialist studies conducted as part of the previous application may still be submitted as part of this application, provided that the findings are still relevant and less than 5 years old.	The marine dispersion modelling was undertaken in 2017 and the wetland delineation in 2016 as such both of these studies are not older than 5 years. An Archaeological, Palaeontological and Cultural Heritage Assessment was conducted for the SEZ in 2010. The CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. These recommendations are included in the impact assessment included below and will be included in the EIA and EMPr. It should be noted that we are aware that generally specialist studies should not be older than 5 years, however, heritage, archaeological and paleontological artifacts are sessile and thus the position of these do not change over time, as such it is considered acceptable to utilise the existing study as the status quo would not have changed. **As above.*
DEFF	Please note that the specialist studies to be conducted must provide a detailed description of their methodology, as well as indicate the locations and descriptions of infrastructure positions, and all other associated infrastructures that they have assessed and are recommending for authorisations.	All specialists have been informed of this requirement. **As above.*

I&AP	COMMENT	RESPONSE
DEFF	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.	All specialists have been informed of this requirement. **As above*
DEFF	Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons, and where necessary, include further expertise and advice.	Noted and agreed. **As above.*
DEFF	The positive and negative cumulative social impacts must be adequately addressed in the report bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area.	Two impacts have been included in the impact assessment section: • Social Benefits from the project mainly related to short term employment and the purchasing of goods locally rated as LOW + • A cumulative impact related to the functionality of the proposed marine abstraction and discharge servitude which will also enable the development of a number of other industries (e.g. G2P, WWTW and the ADZ), which will in term result in a number of indirect employment opportunities. It should be noted that relevant state departments involved with water resource and coastal management (e.g. DWS and DEA: Oceans and Coasts), have advised the CDC that it would be beneficial for the SEZ to have dedicated servitudes for the placement of infrastructure needed for the abstraction of seawater and discharge of treated effluent to the marine environment rather than each industry establishing their own set of infrastructure. This would make management of the volumes and quality of effluent easier, would streamline the maintenance of infrastructure, and would also result in less physical impacts to the coastal environment by reducing the number of points where hard structures are placed in the dynamic coastal zone. As such no other intake and outfall infrastructure is planned in the vicinity of the project and therefore cumulative impacts are unlikely to occur. **As above*

I&AP	COMMENT	RESPONSE
DEFF	Should there be any other similar projects within a 30 km radius of the proposed site, the cumulative impact assessment for all identified and assessed impacts must be refined to indicate the following: • 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 lands. • Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from 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.	**There are two Cerebos intakes within 30 km of the proposed project site. One is located within the Port and one near the Sundays River Mouth. Please note that these intakes were considered during the dispersion modelling. The findings show that due to the high number of dilutions required for the worst-case waste water effluent, the expected waste water effluent conditions were also tested. Under expected waste water effluent conditions, the dilutions (and therefore the environmental guidelines) are achieved for all the proposed seawater intake locations except for the Cerebos seawater intake inside the port. For other effluents, good dilutions are achieved at the proposed intake locations. As such, any waste water discharge via the Coega River will have to be treated on land to meet the required water quality guidelines prior to being discharged.*

I&AP	COMMENT	RESPONSE
DEFF	You are further reminded to comply with Regulation 21(1) of the NEMA EIA Regulations 2014, as amended, which states: "*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 scoping report which has been subjected to a public participation process of a least 30 days and which reflects the incorporation of comments received, including any comments of the competent aauthority". In light of the above, it is concerning to note that the Final Scoping Report is due to be submitted to the Department on 31 August 2020, which is the same due date for I&APs to submit their comments on the DSR. The Department has and is still willing to assist where possible, however it remains the responsibility of the EAP and the applicant to properly manage the application and the potential impacts associated with it. The Department's mandate is to ensure that the requirements of the EIA regulations, in this case submission timeframes as well as the minimum requirements of the public participation process are complied with.*	The EAP will ensure that all I&APs have had the mandatory 30 days for the review of reports and that all comments are incorporated and responded to in the FSR. **The public review period on the Draft Scoping Report was undertaken from the 13th of November to the 14th of December 2020 (i.e. 30 days). All comments received during this period have been incorporated into this IRT and the letters/responses received from I&APs are included in Appendix 1 of this report.*
DEFF	You are further reminded that the final SR to be submitted to this Department must comply with all the requirements in terms of scope of assessment and content of Scoping reports in accordance with Appendix 2 and Regulation 2(1) of the EIA Regulation 2014, as amended.	Please refer to Table 1.2: Requirements for the Scoping Report and content (in accordance with Appendix 2 of the EIA Regulations). This table cross references the legal requirements of the Scoping Report and where these have been addressed in the FSR. **As above.*
DEFF	Further note that in terms of Regulation 45 of the EIA Regulation 2014, as amended, this application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of these Regulations, unless an extension has been granted in terms of Regulation 3(7).	Noted **As above.*

I&AP	COMMENT	RESPONSE
DEFF	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.	Noted **As above.*
Dr. Ane Oosthuizen SANParks	Bearing in mind the development borders on the Addo Elephant National Park Marine Protected Area, SANParks will require 24hr access to the coast through the development zone for various reasons including law enforcement, oil spill operations/clean ups and for monitoring purposes. Please make SANParks access a condition of the EIA.	This has been included in the mitigation measures included in the impact assessment for the project. **As above.*
Dr. Ane Oosthuizen SANParks	A Buffer zone of sufficient distance needs to be between the coastline/coastal zone and developments. Inductions of construction staff and monitoring needs to take place to prevent them poaching/snaring whilst living on site.	As construction will occur within the coastal zone it would not be possible to erect a buffer zone, however only development footprints (i.e. trenches for pipelines) will be disturbed and all other areas will be demarcated as no-go areas. No construction staff will be housed on site. Inductions will be conducted prior to construction. The CDC's Environmental Specifications for Construction contain requirements for Environmental Awareness training and require that the contractor draft method statements for Awareness training. All method statements are verified and approved by the CDC prior to construction commencing. The appointed ECO for the construction phase of the project will monitor compliance of the contractor to the method statements and any other documentation, including the EMPr. **As above.*
Dr. Ane Oosthuizen SANParks	It is extremely important that correct processes including EIA's are followed through DEA national office and no short cuts taken.	Noted and agreed **The CDC agrees. Effective environmental management is key to the success of the CDC and the successful implementation of this project.*

I&AP	COMMENT	RESPONSE
Dr. Ane Oosthuizen SANParks	Cultural Heritage aspects and applicable legislation needs to be taken into account as the area contains cultural historical sites including shell middens.	An Archaeological, Palaeontological and Cultural Heritage Assessment was conducted for the SEZ in 2010. The CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. These recommendations are included in the impact assessment included below and will be included in the EIA. It should be noted that we are aware that generally specialist studies should not be older than 5 years, however, heritage, archaeological and paleontological artifacts are sessile and thus the position of these do not change over time, as such it is considered acceptable to utilise the existing study as the status quo would not have changed. **As above* *Please refer to responses provided to DEFF in the sections above* on *how the CDC has incorporated the heritage guidelines into the Project Environmental Specifications for each project conducted in the SEZ.*
Dr. Ane Oosthuizen SANParks	The development area is found in a very sensitive coastal zone area containing a number of vulnerable and endangered species which need to be protected.	The marine ecological assessment that was undertaken for the previous application for this project will be updated and incorporated into the EIR. In addition, a terrestrial ecological assessment is also being undertaken. **As above*
Wayne Hector (DEFF)	What size mixing zones are being recommended? Is it different for each effluent type being discharged?	Allowed dimensions of initial dilution zones vary across jurisdictions: • USEPA and IFC indicate 100 m in all directions from discharge points, or that calculated by a plume model. • Local (DEA 2015) advice is 100 m radius for enclosed water bodies and those classed as being sensitive environments and 300 m radius in open coast settings where water depths exceed 10 m and distance offshore is >500 m. The proposed discharges will be located in an open coast setting characterised by sometimes vigorous winds and turbulent sea conditions. The inner continental shelf ecosystem hosting the discharges is rated as 'vulnerable' in terms of conservation threat by SANBI; however, this is in common with large extents of the inner continental shelf between Cape St Francis in the south and East London in the north. Consequently, although within a declared MPA this commonality and the open coast setting indicates that a 300 m radius for the initial dilution zone is appropriate. **As above*

I&AP	COMMENT	RESPONSE
Lyndon Mardon (DEDEAT)	Hormones and trace chemicals have not been assessed / discussed in the Lwandle presentation – will the impact of the discharge of these be considered?	This will be considered in the EIR, once the specialist assessments have become available. **Only the constituents provided by CDC have been included in the assessment. Should additional constituents be added to the effluent streams or identified in future, then the end-of-pipe concentrations of these constituents will need to be limited based on the achieved dilutions from the dispersion model and the applicable guidelines, using the precautionary principle in cases where marine water quality guidelines for these constituents are not clear.*
Lyndon Mardon (DEDEAT)	Advised that the precautionary approach must be considered.	Noted and agreed. **As above.*
Lyndon Mardon (DEDEAT)	Indicated that when it comes to E-coli, there appears to have been no consideration for the Cerebos seawater intake. The hazardous impact of this on the foodstuffs at Cerebos must been minimized. Additionally, there are various organisms within the effluent that may have a negative impact. Advised that the water also be looked at from a public health perspective as well, not just from a recreational perspective.	This will be considered in the EIR, once the specialist assessments have become available. **As above.* *As salt concentrations increase through evaporation in salt ponds osmotic pressure increases. Research on the mammalian gut bacterium Campylobacter jejuni, important in causing human gastroentiritus worldwide, shows that survival decreases with increasing osmotic stress (Bui et al 2012, Effect of environmental stress factors on the uptake and survival of Campylobacter jejuni in Acanthamoeba castellani. BMC Microbiology 12: 232). Similar effects can occur in E. coli. E. coli itself can tolerate sodium chloride concentrations to 58.44 g/L (https://en.wikipedia.org/wiki/Salt_evaporation_pondreference). In evaporative salt ponds salt content increases to 260 g/L (Akridge DG 2008, Methods for calculating brine evaporation rates during salt production. Journal of Archaeological Science, 35(6): 1453-1462). This is 4.4 x higher than the apparent toleration threshold. Finally, Cerebos sterilizes their product to remove halophilic bacteria (Http://cerebos.co.za/industrialproducts).* *Consequently toxicity risks are considered to be low as the apparent effects should apply to most of the organisms in the sewage treatment plant discharges.*
Dylan Govender (DEDEAT)	Advised that that they must consider the impact of nano-plastics within the marine environment.	It is unlikely that micro-plastics will get into the effluent discharges that have been assessed. This is usually only the case with storm water discharges. The Draft EIR will include measures to ensure that the design of the storm water infrastructure will prohibit any land-derived litter from entering the marine environment via any stormwater channels. **As above*

I&AP	COMMENT	RESPONSE
Millicent Solomons (DEFF)	DEFF is busy drafting comments on the Draft Scoping Report. Were comments from previous EIA (Scoping Report) considered in the drafting of this DSR? Specifically in relation to the specialist studies that were mentioned. Concerned about the plan of study that was included in the report; suggests that the consultants go back and look at the previous EIA recommendations because not all the recommended studies have been included and no motivation has been given as to why that is.	Based on the IRT for the previous application for this project, DEFF requested the following specialist studies to be completed: • Midfield marine dispersion model to refine the outcome of the near and far field models presented in the FSR and ultimately determine the preferred position of the marine and abstraction servitude(s); • Marine archaeological study; • Terrestrial and aquatic specialist study of the terrestrial environment; • Paleontological specialist study of the terrestrial environment; and • Economic assessment. All of the above studies, with the exception of an aquatic assessment and a palaeontological assessment, are currently underway. Motivations as to why an additional aquatic assessment (Section 7.3.7) and palaeontological assessment (Section 7.3.8) is not required have been included in the Plan of Study of the FSR. **As above*
Wayne Hector (DEFF)	Which is the preferred option wrt alternatives? It must be clearly outlined in the Final Scoping Report.	The alternatives section (Section 2.4) has been revised for clarity purposes. The preferred layout is indicated on Figure 2.10 included in this report. **The alternatives section has been revised in its entirety to ensure clarity and understanding. This section is included in Chapter 2 of this report.*
Millicent Solomons (DEFF)	What informed the location of your pipeline?	Location of the pipeline was informed by the dispersion modelling done in 2017 and again in 2020 where two additional scenarios that were modelled. Placement of terrestrial infrastructure was informed by where the marine infrastructure was going while making sure that all sensitive areas are avoided. **As above*
Millicent Solomons (DEFF)	It is critical that this comes out clearly because we need to look at what mitigation hierarchy you followed to get to your preferred options.	The alternatives section (Section 2.4) has been revised for clarity purposes. The preferred layout is indicated on Figure 2.10 included in this report. **The alternatives section has been revised in its entirety to ensure clarity and understanding. This section is included in Chapter 2 of this report.*

I&AP	COMMENT	RESPONSE
Wayne Hector (DEFF)	Was a palaeontological study or a terrestrial ecological specialist study considered?	Responded that the CDC has conducted a Heritage Impact Assessment, the recommendations of which are included within CDC's Environmental Specifications for Construction. The recommendations from that study fully cover the palaeontological aspect and this will be elaborated on more in the FSR and ensuing EIR. **Based on the IRT for the previous application for this project, DEFF requested the following specialist studies to be completed:* • *Midfield marine dispersion model to refine the outcome of the near and far field models presented in the FSR and ultimately determine the preferred position of the marine and abstraction servitude(s);* • *Marine archaeological study;* • *Terrestrial and aquatic specialist study of the terrestrial environment;* • *Paleontological specialist study of the terrestrial environment; and* • *Economic assessment.* *All of the above studies with the exception of an aquatic assessment and a palaeontological assessment are currently underway.* *Motivations as to why an additional aquatic assessment (Section 7.3.7) and palaeontological assessment (Section 7.3.8) is not required have been included in the Plan of Study of the FSR.*
Lyndon Mardon (DEDEAT)	Have the cumulative impacts been modelled and will they be assessed and reported on in the EIA?	The cumulative impacts from the different effluent streams (i.e. brine, finfish, power generation hub, etc.) will be incorporated into both the marine ecological assessment and the EIR. **As above*
Lyndon Mardon (DEDEAT)	Climate Change must be assessed in the EIA.	The Plan of Study for the EIR makes provision for a climate change chapter to be included in the EIR. In addition, impacts related to climate change have been included in the FSR. **As above*
Lyndon Mardon (DEDEAT)	Noted that air quality impacts are considered as minor; however, air quality impacts can be significant, especially movement of sand dunes.	Noted, however, please note that construction within the coastal zone will be limited to trenching for the construction of pipelines and as such the removal of vegetation, excavations and grading will be limited. This impact will, however, be further refined once specialist reports have been made available.

I&AP	COMMENT	RESPONSE
		*As above
Lyndon Mardon (DEDEAT)	The impact assessment slide indicates that sociological impacts are positive, but very few jobs are likely to be created.	The social impact assessment looked beyond just employment opportunities i.e. buying locally produced construction material, and development of other industries within the SEZ through this project. CDC further indicated that this is largely a construction project so the environmental economic study will also look at the knock-on effect. So, if there is no seawater there cannot be aquaculture nor a power station. The comment was made based on the economic benefits of having access to seawater. The economic impact assessment will assess the impact in detail, and this will in turn be incorporated into the EIR. *As above
Lyndon Mardon (DEDEAT)	Noise impacts on marine fauna must be assessed. Added that if knock-on impacts of this study are going to be looked at together, then all the environmental impacts associated with all the supporting projects. If that is the principle, then the risk assessment matrix needs to be reconsidered.	The noise impact included in the DSR has been re-assessed to include any potential impact on marine mammals. The specialist study undertaken by TNPA in 2014, will be provided to the marine ecological specialist for incorporation into the marine specialist report. The findings of the marine specialist in response to noise will be included in the Draft EIR. *As above
Rene de Klerk	Impacts on marine mammals during blasting must be assessed. TNPA conducted a detailed study iro this issue, with onerous conditions that were recommended. This study will be provided to the EAP.	Please refer to response included above. Clarified that the issues discussed in the DSR are preliminary because no specialist reports have been received yet. They will be refined as the specialist reports are received. *As above
COMMENTS RECEIVED FOLLOWING THE NOTIFICATION OF THE AVAILABILITY OF THE DRAFT SCOPING REPORT FOR PUBLIC REVIEW (THIS APPLICATION RELEASED IN NOVEMBER 2020)		
Paul Martin Tel: 041 4665698 Cell: 0732524111 email: pmartin@axxess.co.za	Nicole, My comment on the Revised DSR: Unfortunately I cannot find in the main body of the Revised DSR any reference to the submission of the previous (July 2020) DSR and Aug 2020 Final Scoping Report (FSR).	Good morning Paul, Apologies for the delayed response to your email. I have been off recovering from COVID. Unfortunately, because we had to resubmit a completely new Application and Draft Scoping Report (DSR), we could not make the changes to the report in track changes. However, the main amendments to the report include the project description and alternatives sections.

I&AP	COMMENT	RESPONSE
	Nor can I find any indication on what amendments have been made to this DSR compared to the July DSR / August 2020 FSR (if it is in the document it is not obvious). So I&APs are forced to go through the entire document again if they want to comment further. I see my comments sent 31 Aug 2020 are included in the I&AP section (p206) but the opportunity was not taken in the revised DSR to answer my queries (it says these will be addressed in the FSR). My 31 Aug 2020 comments are attached again for ease of reference. An additional comment is that Section 4.6.4 (p103) on Birds is out of date. It refers to Barnes (2000) instead of the 2015 SA Red Data Book (Taylor et al.). Consequently many of the threat statuses are incorrect and there may be some species of conservation concern omitted. Please provide a copy of the Final Scoping Report in due course.	Thank you for re-attaching your comments. These will be addressed and included in the Final Scoping Report (FSR). As a registered I&AP on this project, you will be notified of the availability of the FSR for public review. Thank you for your comments on Section 4.6.4 (p103) regarding the information on the birds. We will ensure that this Section is updated accordingly in the Final Scoping Report. Kind regards, Nicole
	Leaks: Designs / operational mitigation to detect and prevent seawater leaks on land is required (seawater is a potent herbicide). There is a similar requirement to prevent / detect leaks along the effluent infrastructure.	**Mitigation measures currently include the following:* • *The pump stations will have a built in safety mechanism in the event of loss of pressure.* • *Regular maintenance inspections.* • *Additional emergency / mitigation measures will be explored in the EIA Phase if required.*
	Water Quality: Noted that this EIA will assess water quality impacts (from e.g. the proposed WWTW, Aquaculture & power stations) on the marine environment. As the full extent and nature of the industries are not yet known a very precautionary / worst case scenario approach is required, especially as very few WWTW in RSA comply with their permit conditions. Aquaculture will presumably result in elevated nutrient levels in discharge water. It is noted that the proposed discharge pipe locations are “upstream” (west to	**The following six effluent types are considered in the PDRW 2020 dispersion modelling:* *1. Abalone effluent from land-based aquaculture (AB).* *2. Wastewater from the proposed Coega Wastewater Treatment Works:* *a. WW1: Phase 1 with the effluent discharged into the Coega River which in turn discharges into the Port of Ngqura. The constituent concentrations provided by CDC represent an upset condition.* *b. WW2: Phase 2 with effluent discharged offshore via a submarine pipeline. The constituent concentrations provided by CDC include industrial effluent and represent an upset condition.*

I&AP	COMMENT	RESPONSE
	east longshore drift) of the proposed intake pipes – leading to a contamination risk (noted that modelling will be done to assess this).	*3. Finfish effluent from land-based aquaculture (FF).* *4. Desalination brine from a 60 MLD Reverse Osmosis desalination plant (BR).* *5. Cooling water from the two Liquefied Natural Gas (LNG) power plants in Zone 10S and Zone 10N (note that the inland Zone 13 power plant will use air rather than seawater cooling and is thus not considered in this study). The following three options are being considered for the cooling:* *a. CW1: Once through cooling (Zone 10S) plus wet mechanical cooling (Zone 10N).* *b. CW2: Once through cooling (Zone 10S) plus air cooling (Zone 10N).* *c. CW3: Wet mechanical cooling (Zone 10S) plus wet mechanical cooling (Zone 10N).* *To limit the number of scenarios modelled, only two of the three cooling water options were modelled. CW1 and CW2 have similar flow rates, but CW2 has a slightly higher temperature and required dilution (refer Table 6-1 in the Dispersion Modelling Report available as Appendix 5) and CW2 was thus selected for modelling as the more conservative option between CW1 and CW2, although there will be minimal difference in the results. CW3 was selected as it has the lowest flow rate and highest salinity.* *6. Heating water from LNG vaporiser:* *a. HW1: The vaporisers use the warm cooling water from the power plant (only possible for once through cooling).* *b. HW2: The vaporisers use sea water from an intake in the Port of Ngqura.* *The characteristics of each individual effluent were provided by CDC and are given in Table 6-1 of the PRDW 2020 report. In this table a constant ambient seawater temperature, salinity and density of 10.0°C, 35.0 PSU and 1025.30 kg/m^3 are assumed, although in the model simulations these will vary in time and space.* *Also shown in Table 6-1 are the required dilution for each constituent to meet the applicable water quality guideline target concentration, which is calculated using the equation below. Please refer to Lwandle (2020), available as Appendix 6 to this report for details of the guidelines and background concentrations applied.* $Required\ dilution = (Effluent\ concentration - Background\ concentration)\ (Target\ concentration - Background\ concentration)$ ***Eqn 1***

I&AP	COMMENT	RESPONSE
		Only the constituents provided by CDC have been included in Table 6-1 and are thus included in the model. Should additional constituents be added to the effluent streams or identified in future, then the end-of-pipe concentrations of these constituents will need to be limited based on the achieved dilutions from the dispersion model and the applicable guidelines, using the precautionary principle in cases where marine water quality guidelines for these constituents are not clear. *The power plant and desalination plant designers must ensure that any co-discharges meet the applicable water quality guidelines at end-of-pipe, thus ensuring that temperature and/or salinity are the limiting constituents in these effluents, e.g. the World Bank specifies an average free chlorine of 0.2 mg/l at end of pipe (IFC, 2007).* *Temperature and salinity were modelled explicitly as these affect the density of the discharge. For temperature, the non-conservative heat exchange between the sea and the atmosphere has also been included in the model. The remainder of the constituents provided above were modelled as conservative tracers and the results presented as the achieved dilutions.*
	Alien Marine Organisms: The Aquaculture Zone EIA did not assess the impact of escaped marine organisms (from aquaculture projects) on the marine environment. Will this EIA do so / how will mitigation ensure that nothing gets into the discharge systems.	**The impact of alien marine organisms was assessed in the ADZ EIA; i.e. ecological impacts due to escapees, and impacts due to the transfer of diseases, pathogens and parasites to wild stocks. The impact was rated as very high without mitigation and medium with mitigation. Some mitigation measures include the following:* o *Develop and implement a biosecurity management plan and disease and animal health management plan for the ADZ which covers all aquaculture operations within the ADZ.* o *Develop a comprehensive monitoring programme for the ADZ to include water quality in incoming water sources and effluent discharges, sediment physical and chemical characteristics, biological monitoring at the intake and discharge points (benthic invertebrates, phytoplankton etc.), assessment of exotic and invasive species in adjacent water, health monitoring and monitoring the compliance of individual farms with disease and fish health standards in accordance with the ADZ biosecurity management plan and disease and animal health management plan. The monitoring programme must incorporate both baseline assessments prior to impact, reference points outside of the local area of impact, action thresholds and performance assessment criteria.*

I&AP	COMMENT	RESPONSE
		○ *Individual aquaculture farms must comply with the Alien and Invasive Species (AIS) Regulations (GNR 598, GG 37885), which may include an operation specific risk assessment and approval by the relevant authorities prior to commencement of any operations. No species on the Prohibited Species List should be considered for culture in the ADZ.* ○ *Individual investors to develop and implement a biosecurity management plan and disease and animal health management plan for their operations in the ADZ.* ○ *All organisms obtained from other hatcheries or imported to be sourced only from certified disease, pathogen and parasite free sources.* ○ *In order to minimise negative genetic impacts, broodstock and grow-out organisms should originate from the same genetic stock as the wild populations adjacent to the facility. The respective national Genetic Best Management Practice Guidelines for collection and husbandry of the culture species and the DAFF permit conditions for broodstock collection and facility operation should be followed at all times (e.g. Genetic Best Management Practice Guidelines for Marine Finfish Hatcheries in South Africa, 2016). This includes adherence to movement restrictions of specimens between disease and genetic management zones.* ○ *Culture facilities must be designed to have multiple redundancy exclusion barriers or screens fine enough to contain the live stages of the organisms being cultured (eggs, larvae, juveniles etc.).* ○ *Incoming water must be treated and sterilised to prevent the amplification of naturally occurring diseases and pathogens.* ○ *Exclusion barriers to be maintained through a farm specific standard operating procedure and in accordance with the ADZ biosecurity management plan.* ○ *Consider sterilisation of fish through hybridisation or single sex production to provide genetic security from invasive species.*

I&AP	COMMENT	RESPONSE
		○ *Effluent water from hatcheries and grow-out facilities should be treated to prevent escapees and the transfer of pathogens and diseases into the nearshore marine environment. The type of treatment is dependent on the culture organisms, culture methods, discharge volumes and biosecurity risk and need to be developed on an individual basis per aquaculture operation. Possible methods include sand filtration, ozonation or UV filtration but will be farm specific based on the culture species, design (flow through/re-circulating), water volumes and flow rates and must be determined in each farm level biosecurity management plan. Where there is a risk, and depending on the species, effluent water to be filtered and sterilised prior to discharge to prevent the escape of eggs, larvae and juveniles.* ○ *Effluent water from individual operations to comply with effluent discharge and water quality standards as per CDC coastal wasters discharge permit before release to the marine pipeline.* ○ *Individual operations to develop farm specific monitoring programmes, including water quality, disease and fish health monitoring, pathogens in the facility, escapee trap performance, and incorporate action thresholds and performance assessment criteria.* ○ *Brood stock of indigenous species must be obtained from the same disease and genetic management zone in which the study area is situated.* ○ *Ongoing monitoring of escapee management control measures on individual farms and at the ADZ level to monitor compliance and performance of the management measures is required.* ○ *Open, non-enclosed farms must have effective physical barriers to exclude birds and other wildlife in order to prevent potential disease transfer vectors from accessing holding tanks and waste water sources. Non-lethal bird netting and screens may be used to ensure isolation of individual operations from each and prevent transmission vectors from accessing water sources.* ○ *Quarantine and disease treatment tanks must be effectively isolated for other production sections of the facility and stringent sterilisation of the effluent water must be undertaken. Staff accessing these areas must comply with the biosecurity standards.* ○ *All organisms introduced to the facility should be isolated in a quarantine system for a period of six weeks and subject to regular health inspections to monitor for disease.* ○ *The effluent discharge point has yet to be determined as part of a separate EIA but should be sited as far as possible from the intake location to reduce the risk of re-introduction of pathogens.*

I&AP	COMMENT	RESPONSE
		In addition, a specialist study was conducted to support this aspect; i.e. a biosecurity and biodiversity risk assessment, prepared by TG Paulet. Further, the updated and approved EMPR for the ADZ included a detailed Biosecurity Management Plan.
	Heritage: Noted that the Heritage Impact Assessment (2010) and the Recommendations of SAHRA dated 16 March 2011 will be adhered to. There will almost certainly be shell middens along the pipeline routes through the coastal zone.	**An Archaeological, Palaeontological and Cultural Heritage Assessment was conducted for the SEZ in 2010. The CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. The CDC's Environmental Specifications for Construction include detailed requirements for the management of heritage in the SEZ, amongst others, the appointment of an archaeologist and palaeontologist during the construction phase of a project. These recommendations are included in the impact assessment included below and will be included in the EIA. It should be noted that we are aware that generally specialist studies should not be older than 5 years, however, heritage, archaeological and paleontological artefacts are sessile and thus the position of these do not change over time, as such it is considered acceptable to utilise the existing study as the status quo would not have changed.*
	Decommissioning / Repairs: At all stages construction / repair waste (old pipes, etc) need to be removed – including all scrap, etc underwater. The marine engineering work looks complicated – meaning a lot can go wrong.	**Agreed, the EMPr to be submitted as part of the EIA documentation will allow for this.*
	Ownership of the infrastructure: Presumably CDC is going to be the holder of the Environmental Authorization (EA) and will be responsible for ensuring the operational maintenance of the infrastructure and ensuring that all tenants comply with requirements? A rigorous monitoring and enforcement system is required to prevent tenants shirking their obligations (this must be a condition of the EA).	**Yes, the CDC will be the owner of the infrastructure and responsible for all mitigation and monitoring measures included in the EIA, EMPRs and EA (if issued by DEFF). The CDC will also need to adhere to the conditions tied to the Coastal Waters Discharge Permit to be issued by DEFF: Oceans and Coasts.*
	Existing EAs / RoDs / EMPrs: Existing Environmental Authorisations & their EMPRs for areas impacted by the development need to be checked to avoid any conflicting recommendations / actions (e.g. The Port & CDC RoDs, Mining & Aquaculture EAs, Manganese EA, etc).	**CES are aware of these authorisations and will ensure that no conflicting mitigation measures are included into the EMPRs.*
	Mammals:	**Thank you, these conditions will be incorporated in the EMPr. These conditions have also been included in the impact assessment (Chapter 6) of this report.*

I&AP	COMMENT	RESPONSE
	a. 2002 Port RoD Condition 2.18: "The NPA must ensure that the Duthies golden mole and Pygmy hairy-footed gerbil occurring in the dune habitats in the Coega area are included in the relocation and management plan to the satisfaction of the relevant provincial environmental department". See attached that includes a discussion that *Gerbilliscus paeba exilis* that has known colonies at the bases of the Ngqura breakwaters may be a distinct threatened species. b. Blasting must e.g. avoid whale periods (especially Southern Right Whale calving periods and Humpback Whale Cow/Calf return migration periods).	
	Avifauna: a. E.g. Table 4.4: SCC bird species should include Regional (SA Red Data Book) & Global (IUCN Red List) species as well as gazetted Threatened or Protected Species (TOPS) – both Terrestrial and Marine (e.g. GN 476 dd 30 May 2017). b. Bird lists for the area are included in previous EIAs / available on BIrdMap (e.g. Bush Blackcap / Black-tailed Godwit are at best vagrants, Black Oystercatcher is no longer a SCC). c. Damara Tern colony: See Mining Right EIA avifauna report for potential impacts. Apart from direct disturbance impacts on the colony, indirect impacts include water quality / turbidity (may impact the feeding grounds of this near-shore feeder), sand starvation of the dunefield – if this project further prevents sand entering the dunefield this will be an additional impact, attraction of mammalian and aerial predators (e.g. due to effluent discharges, marine material / waste at the pump stations). Timing construction to avoid the Damara Tern breeding period should be considered as one of the mitigating actions & there should be continued colony monitoring.	**The avifaunal section (including the list of species of special concern) in this report has been updated in its entirety.* *The impacts suggested by Dr Martin have been forwarded to the ecological specialist and will be incorporated and rated by the ecological specialist and included in the Ecological Assessment to be submitted as part of the EIA documentation.*

I&AP	COMMENT	RESPONSE
	d.If the seawater intake results in Cerebos closing its Coega Saltpans (as it will have access to alternative brine sources), this will have a Very High Permanent Impact on avifauna (see Manganese Project EIA). It is not clear which project EIA will assess this possibility – if the saltpans cease to operate is a decommissioning EIA required before the pans start to dry out?	
Rob Milne Senior Section Ranger (Marine) Addo Elephant National Park South African National Parks Tel: (042) 233 8600 Cell: 082 483 2477 E mail: rob.milne@sanparks.org	Hi Nicole Kindly register me as an interested and affected party for the proposed Coega Marine Intake and Outfall Servitude(s) Project. Kind Regards	Good morning Mr Milne, Thank you for your email. Please note that if you have received the below email notification, you are a registered Interested and Affected Party (I&AP) on our I&AP database for the Coega Marine Intake and Outfall Infrastructure Servitude project. As such, you will receive updates on the process as well as the availability of reports for public review. Should you have any queries, please do not hesitate to contact me.
Dr Ané Oosthuizen National Marine Co-ordinator Park Planning & Development South African National Parks 071 4000371 Ane.Oosthuizen @sanparks.org	HI Nicole Just attempted to contact you at the below stated tel no, the office informed me you are on sick leave . I'd like to request a meeting with you, for a presentation on the project. Next week and on Tuesday 1 at 8am specifically would be preferred. Alternatively on the 3 Dec. Could you please confirm availability of you or a fellow colleague to engage us. Many thanks	Good morning Ane, Thank you for your email. I am currently recovering from COVID. We are able to do a virtual meeting / presentation on the 3rd of December. Please kindly confirm if this is suitable? Thank you and kind regards, Nicole
	Dear Nicole I hope you recover fully.	*Meeting Invite Sent*

I&AP	COMMENT	RESPONSE
	Thank you for accommodating us on the 3rd. Please copy all above to the meeting invitation.	
	Dear Nicole and Chantel As I was typing this your meeting request came through. Hope you are recovering well Nicole. Could we please delay our proposed meeting on the 3rd to the 8th if possible. I am on family leave due to a death in the family, and will not be able to attend on the 3rd. Apologies, and thanks	My sincere apologies and condolences for the loss of your loved one. I have amended the meeting invite as requested.
Matthew Hills NMBM:Civil Engineer: Planning & Research Division Water & Sanitation Sub-Directorate Infrastructure & Engineering Directorate Cel: 079 490 0911 Email: mhills@mandelametro.gov.za	Good afternoon all, 23.09 m3/sec is equivalent to 1994.976 ML/day. Either that is exceptionally impressive or the units should be litres per second instead. Kind regards,	**The amount is correct as 23.09 m^3/s*
Riccardo Maresca Legal Advisor riccardo.maresca@msc.com	Good morning Nicole Would you please be so kind to send the PDF version of the draft EIA? Thanks and best regards	Good morning Riccardo, Thank you for your email. The Draft Scoping Report can be accessed and downloaded via our website at the following link: http://www.cesnet.co.za/assets/Draft%20Scoping%20Report%20%20revised%2013.11.20_compressed.pdf

I&AP	COMMENT	RESPONSE
		Please let me know if you have any difficulty accessing the document.
Wayne Hector DEFF WHector@environment.gov.za	Dear Nicole The Department's comments on the DSR is up for management review and will be emailed to you shortly. Kind regards Wayne	Dear Wayne, Thank you for the feedback. Much appreciated.
Questions and Answers from the ELC Meeting held in November 2020		
Andries Struwig (DEDEAT)	This EIA application was refused by DEFF recently. Can you elaborate on the reasons and how these have been addressed in the revised EIA application?	CES: Primary reasons for rejection revolved around the alternatives not being adequately described and the project description not being sufficiently detailed and descriptive. CES thus needed to explore, in a more rigorous way, the elimination of alternatives and the selection of the preferred alternatives. CES was surprised about the rejection of the scoping report because we used a general scoping report that we normally use and which is normally approved. During the scoping stage it is difficult to provide definitive reasons for the selection of preferred alternatives before the EIR stage has started and before the specialist studies have started. Another reason provided for the refusal was that there was an omission of original IAP comments from the relevant PPP appendix to the Final Scoping Report.
Andries Struwig (DEDEAT)	Discharge of effluent from a future WWTW is being considered. Why are we still looking at options for discharge of effluent instead of treating it and re-using it?	**The CDC** cited the EIA that would need to be conducted for the future WWTW would need to investigate options of effluent re-use. The Marine Dispersion Modelling done for the Marine Pipeline EIA looked at the worst-case scenario of discharge of effluent and therefore the WWTW effluent was included. This inclusive approach also guided the identification of the servitude (intake and discharge) locations and whether different effluents could be mixed and how this would impact on the dispersion of those individual and mixed effluents. A range of scenarios was modelled. The modelling has been the key input into determining the location of the intake and discharge servitudes.

I&AP	COMMENT	RESPONSE
Andries Struwig (DEDEAT)	Noted that the western servitude alternative is not preferred due to terrestrial ecological reasons. How is this different from the eastern alternative?	**CES:** The marine dispersion modelling determined that the plume from a western discharge option would be entrained into PoN, therefore the eastern option is preferred. Similarly, from an economic perspective, the western discharge is not preferred due to plume entrainment into the PoN. With respect to the western alternative intakes, the costs associated with construction and OPEX of pumping are not feasible. An economic assessment is underway addressing economic feasibility, GHG emissions and costs to the biodiversity.
Wayne Hector (DEFF)	Require confirmation on the status of the CWDP – has the application been submitted already?	**CES:** A Coastal lease and CWDP applications, ito ICMA, have not yet been submitted, but we have been engaging with DEA O&C.
Wayne Hector (DEFF)	The DEFF is closed as from 15 Dec – 5 Jan. The application will only be acknowledged on 5 Jan '21.	**CES:** The application will be submitted prior to the Dec shut-down period.
Wayne Hector (DEFF)	For the intake of seawater, are you applying for approval of two (2) intake servitudes? For the discharge of effluent, are you applying for the approval of three (3) discharge servitudes?	**CES:** Confirmed that two (2) intake servitudes are required, one inside the PoN for the cooling water intake requirements of the proposed power stations, and the other intake servitude is east of the PoN to accommodate the intake requirements for desalination and aquaculture. Within each intake servitude, a number of different seawater abstraction technologies will be utilised, depending on industry requirements. Approval is being sought for all the different abstraction technologies. Three (3) discharge servitudes and associated discharge infrastructure are required, all east of the PoN, to accommodate the discharge of brine (from desalination), cooling water (from power stations), storm water, effluent from aquaculture (finfish and abalone) and effluent from the WWTW.
Andries Struwig (DEDEAT)	With reference to the risk matrices in the description of the alternatives, does the term "not preferred" mean the alternative is a fatal flaw?	**CES:** Have used a traffic light system for the risk matrices. Red does not necessarily indicate a fatal flaw. This will be clarified in the methodology.
Muhammad Essop (DEFF)	Is there a permit required ito Section 48 of NEMPAA? EAP must consider.	**CES:** Not as far as aware, but will verify and confirm.
Andries Struwig (DEDEAT)	The comment that the economic cost is too large is always used to motivate why a project should or should not go ahead. Such a comment should be substantiated by looking at the overall project cost including the environmental cost.	**CES:** With the economic cost, CES agrees that we have to consider the environmental cost and one of the specialist studies does include an analysis of the economic costs and the benefits of this. The current economic assessment will be looking at biodiversity costs; it will also be looking at things like additional GHG emissions associated with large pumping requirements, as well as large electricity usages. So the economic assessment will be looking at both the ecological and environmental costs and as well as the biological costs and this information will be included into the EIR.
Comments received from DEFF on the 14 December 2020 regarding the Draft Scoping Report		

I&AP	COMMENT	RESPONSE
DEFF	(i) If the activities applied for in the EIA application from differ from those in the FSR, an amended application form must be submitted. Please note that the Departments application form template has been amended and can be downloaded from the following link https://www.environment.gov.za/documents/forms.	*The listed activities within the revised Scoping Report corresponds to those submitted to the DEFF in the application form.*
DEFF	(ii) Please ensure that all issues raised and comments received during the circulation of the draft SR from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity, including SANPARKS, this Department's Biodiversity Section, are adequately addressed in the final SR. Proof of correspondence with the various stakeholders must be included in the Final SR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of Regulation 39,40, 41, 42, 43, & 44 of the EIA Regulations 2014.	**The public review period on the Draft Scoping Report was undertaken from the 13th of November to the 14th of December 2020 (i.e. 30 days). All comments received during this period has been incorporated into this IRT and the letters/responses received from I&APs are included in Appendix 1 of this report.*
DEFF	(iii) A comments and response trail report (C&R) must be submitted with the final SR. All comments from I&APs must be adequately responded to. Please note that a response such as "noted" is not regarded as adequate response	*This table constitutes the comments and response trail report (C&R) and includes all comments submitted by I&APs to date, including historical comments on previous applications. Proof of all PPP is included in Appendix 1.1 (historical) and Appendix 1.2 (recent).*

I&AP	COMMENT	RESPONSE
DEFF	(iv) The C&R report must include all historical comments for this development. However, the comments must be presented or grouped according to the stage of commenting, for e.g., all comments on the pre-app meeting held in August 2019 are grouped together under a clear heading for easy reference so as to avoid mixing of issues. Please indicate the dates and how the comments were presented. i.e., a column must be which specify the date (e.g. 11/11/2020 via email or 12/12/2020 via letter). For historical comments you are not required to provide proof of correspondence , a summary of issues and the responses thereto will suffice. However, proof of correspondence is required for all the comments obtained on this application 14/12/16/3/3/2/2036. The final SR must provide evidence that all identified and relevant competent authorities have been given an opportunity to comment on the proposed development.	*This table constitutes the comments and response trail report (C&R) and includes all comments submitted by I&APs to date, including historical comments on previous applications. Proof of all PPP is included in Appendix 1.1 (historical) and Appendix 1.2 (recent). Comments are grouped in order of the process being undertaken as requested.*
DEFF	(v) Please ensure that a description of any identified alternatives for the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives will have on the environmental and the community that may be affected by the activity as per Appendix 2 (1) © (d) and 2 (h) of GN R. 982 of 2014 is provided. Alternatively, you should submit written proof of investigation and motivation if no reasonable or feasible alternatives exist in terms of Appendix (2)(x)(xi).	**The alternatives section including the alternatives section in the Plan of Study has been revised in order to make it more clear and concise. This section includes a table indicating gaps, uncertainties and assumptions. Tables showing the advantages and disadvantages of the various alternatives are included in the alternatives section of this report (Section 2.6)*
DEFF	(vi) In accordance with Appendix 2 (2) (a) of the EIA Regulations 2014, the details of – (i) the EAP who prepared the report; and (ii) the expertise of the EAP to carry out Scoping and Environmental Impact Assessment procedures; must be submitted.	*Bios of the entire project team has been included in Chapter 1 of this report. In addition, the Curriculum Vitae of the EAP, Dr Alan Carter, is included as Appendix 2 of this report*

I&AP	COMMENT	RESPONSE
DEFF	(vii) Please ensure that the final SR includes a legible site layout map; an environmental sensitivity map indicating all environmental sensitive areas and features; a map combining layout map superimposed (overlain) on the environmental sensitivity map; and a regional map of the area.	*Site Layout Plan – Figure 2.1 & Figure 2.12* *Environmental Sensitivity Map with Infrastructure Layout – Figure 2.21* *Regional Map – Figure 2.2* *No google maps have been included in the FSR.*
DEFF	(viii) Please note that the specialist studies conducted as part of the previous application may still be submitted as part of this application, provided that the findings are still relevant and less than 5 years old.	*The marine dispersion modelling was undertaken in 2017 and the wetland delineation in 2016 as such both of these studies are not older than 5 years.* *An Archaeological, Palaeontological and Cultural Heritage Assessment was conducted for the SEZ in 2010. The CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. These recommendations are included in the impact assessment included below and will be included in the EIA and EMPr. It should be noted that we are aware that generally specialist studies should not be older than 5 years, however, heritage, archaeological and paleontological artifacts are sessile and thus the position of these do not change over time, as such it is considered acceptable to utilise the existing study as the status quo would not have changed.*
DEFF	(ix) Please note that the specialist studies to be conducted must provide their comments and recommendations on the preferred alternatives.	*All specialists have been informed of this requirement.*
DEFF	(x) Should the appointed specialist specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and where necessary, include further expertise advice.	*Noted and agreed*.
DEFF	(xi) The specialist studies must also provide 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.	*All specialists have been informed of this requirement.*

I&AP	COMMENT	RESPONSE
DEFF	(xii) 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 scoping reports in accordance with Appendix 2 and Regulation 21(1) of the EIA Regulations , 2014.	*Please refer to Table 1.2: Requirements for the Scoping Report and content (in accordance with Appendix 2 of the EIA Regulations). This table cross references the legal requirements of the Scoping Report and where these have been addressed in the FSR.*
DEFF	(xiii) Please ensure that the Appendices uploaded via the online system are fully labelled for easy reference, for e.g. "Appendix 10: Declaration of the Applicant".	*All appendices will be uploaded separately and will be adequately labelled.*
DEFF	(xiv) Further note that in terms of regulation 45 of the EIA Regulations 2014, this application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of these Regulations, unless an extension has been granted in terms of Regulation 3(7).	*This FSR will be submitted by 15 January 2021 in order meet the requirements of Regulation 45 of the EIA Regulations.*
General		
DEFF	You are further reminded to comply with Regulation 21(1) of the NEMA EIA Regulations 2014, as amended, which states: "*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 scoping report which has been subjected to a public participation process of a least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority".*	*The public review period on the Draft Scoping Report was undertaken from the 13th of November to the 14th of December 2020 (i.e. 30 days). All comments received during this period has been incorporated into this IRT and the letters/responses received from I&APs are included in Appendix 1 of this report.*
DEFF	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 Scoping reports in accordance with Appendix 2 and regulation	*Please refer to Table 1.2: Requirements for the Scoping Report and content (in accordance with Appendix 2 of the EIA Regulations). This table cross references the legal requirements of the Scoping Report and where these have been addressed in the FSR.*

I&AP	COMMENT	RESPONSE
DEFF	Further note that in terms of Regulation 45 of the EIA Regulations 2014, as amended, this application will lapse if the application fails to meet any of the timeframes prescribed in terms of these Regulations, unless and extension has been granted in terms of Regulation 3(7).	This FSR will be submitted by 15 January 2021 in order meet the requirements of Regulation 45 of the EIA Regulations.
DEFF	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.	The Applicant, Coega Development Corporation (CDC), is aware that no activity may commence prior to an Environmental Authorisation being granted by the Department.
Comments received from SANParks on the 11th of December 2020 regarding the Draft Scoping Report		
SANParks	Algoa Bay is a highly biodiverse area and important for recreational and commercial fisheries as well as marine tourism. South African National Parks (SANParks) is the national conservation authority responsible for management of the Addo Elephant National Park and Marine Protected Area. The Management plan of Addo Elephant National Park can be found at: https://www.sanparks.org/conservation/park_man/approved_plans.php and the MPA notice and regulations at http://www.gpwonline.co.za/Gazettes/Pages/Published-Gazettes.aspx	*CES is aware of the SANPark's authority in this regard as well as the sensitivity of particularly Jahleel island and the African Penguin. This is noted in Section 4.8.3 of the Scoping Report.*

I&AP	COMMENT	RESPONSE
	SANParks manages the largest remaining colonies of African penguins, with ±7,616 breeding pairs (57%) on St Croix and Bird Islands within the Addo Elephant National Park MPA. The African penguin population has declined dramatically on a national scale. They were classified as Endangered by the IUCN in 2010, following a 61% decrease in their population over 28 years (BirdLife International 2010). The South African population was estimated at 13,312 breeding pairs in 2019, which represents a 42% decline since 2010. If current population trajectories continue, the African penguin will become functionally extinct in the wild (Sherley et al. 2018). St Croix island, with the largest remaining breeding colony of the African Penguins are situated within 5km and Jahleel within 500m of the Port.	
SANParks	SANParks are concerned over the several possible risks and longterm impacts from this project on water quality, marine biodiversity, the pelagic food chain, pelagic fish species serving as prey for the penguins, the island ecosystems, and disease risks amongst others.	*A marine ecological assessment is currently underway and will address these issues in particular.*
SANParks	The report lacks a more strategic view in tying together all of the proposed activities which are to make use of the infrastructure. SANParks requests a map with the proposed facilities (aquaculture, WWTW, desalination and power plants, storm water system) along with the infrastructure for which authorisation is sought is provided in the report (similar to figure 2.3 in report). Ideally this map should show the proposed location of infrastructure between the intake / discharge points and the facilities (including the drainage areas for the storm water discharge points).	*All infrastructure related to the proposed project is included on the project layout map (Figure 2.3), with the exception of the proposed future WWTW, which is currently earmarked in Zone 5 of the SEZ.*

I&AP	COMMENT	RESPONSE
SANParks	Background detail regarding the structures that the pipelines will service should be included in the report. This should include the status of each of the facilities (power plants, aquaculture, desalination plant, WWTW and the storm water system on site) – have they been constructed, have designs been finalised, have authorisations been obtained, if not how far along in the process are the applications (these should be cross referenced e.g. EIA application numbers provided or EA provided as an appendix), etc.	*<u>Power Plants</u>: *There are currently 4 EIAs being conducted for the proposed power plants, 2 in Zone 10 and 1 in Zone 13 as well as an LNG Gas Hub. The Scoping Reports for these projects have recently been accepted by the relevant authorities (DEFF). For any further details regarding these projects please contact Ms Nicola Rump (SRK) at NRump@srk.co.za.* <u>Aquaculture</u>: *The EA for the ADZ was issued on the 7th of February 2018 (EA14/12/16/3/3/3/214). Construction of the bulk services to service the ADZ commenced in 2020.* <u>Desalination Plant</u>: *The desalination plant was approved as part of the EA for the ADZ. The intake and discharge pipelines to/from the desalination plant are the subject of the marine pipeline EIA. The desalination plant is earmarked to commence construction in the latter part of 2021.* <u>WWTW</u>: *EIA yet to be conducted.* <u>Stormwater Infrastructure in Zone 10</u>: *Construction earmarked to commence in the latter part of 2021.* *All available documentation can be obtained from the CDC upon request / or is available for download on the CDC Website:* *http://www.coega.co.za/DocumentList.aspx?cmd=browse&objID=80&catID=51*
SANParks	The reuse options of grey water to be explored as part of the WWTW application (given that it is a water stressed area) would be critical before a decision can be made on what type of outfall infrastructure is approved. In this case, the WWTW application needs to first be finalised before approval for the discharge infrastructure is sought. The location of the proposed WWTW structure, land-based water filtration / purification systems and distance to the discharge point need to be indicated on a map. Given that this will be discharged into an MPA, worst case scenarios need to be avoided and therefore approval of structures to accommodate such flows before treatment scenarios are investigated and approved is inappropriate.	*The NMBM appointed an EAP in 2014 to commence with the EIA for their future WWTW, to be located in Zone 5 of the SEZ. The application was never submitted; however, some planning was done, including a number of presentations to the ELC. The recommendation by the authorities at the time was that the effluent from Phase 1 of the proposed WWTW may be considered for discharge (once treated to specifications in the WWTW) into the Coega River. Treatment was also to consider reed beds. The motivation for the discharge of the Phase 1 effluent into the Coega River was based on economic reasons, as it would be far cheaper than to construct a pipeline and pump that volume of effluent from the WWTW to a marine outfall. However, this would have had to be assessed in the EIA that is required for the WWTW. As the application was never lodged, this proposal has not been authorised. The recommendation by the authorities for the Phase 2 effluent from the WWTW was that this additional volume would be too much for discharge to the Coega River, and hence the decision was made to consider pumping the Phase 2 effluent to a marine outfall. The Phase 2 effluent could also include heavy metals from industrial effluent, which Transnet was concerned about, as it may risk their compliance to their dredge disposal permit from the DEFF. Already the sediment monitoring in the*

<table>
<tr><th>I&AP</th><th>COMMENT</th><th>RESPONSE</th></tr>
<tr><td></td><td></td><td>Port of Ngqura shows above average metal content in the case of some of the metals. Because the CDC was conducting the marine pipeline EIA at the same time as the NMBM was conducting their WWTW EIA (in 2014), it was recommended that the marine dispersion modelling being done by the CDC (PRDW) must include the Phase 2 effluent from the WWTW. The Marine Pipeline EIA wasn't actually seeking approval for the phase 2 effluent pipelines; but rather the modelling included the Phase 2 effluent to see whether it was indeed viable to discharge this effluent to the marine environment. The Phase 2 effluent also needed to be modelled to see whether it affected the location of the proposed seawater intakes and discharges. The outcome of PRDW's various modelling shows that a worst-case scenario for Phase 2 effluent discharge is not advised, and that any effluent from the WWTW would need to be treated on land prior to any discharge into the marine environment. These recommendations would need to be taken into consideration during the EIA process that is yet to be conducted for the proposed WWTW project.</td></tr>
<tr><td>SANParks</td><td>SANParks are concerned that the alternative outfall site west of the Port were discarded due to economic reasons. The outfall to the west of the Port still remains SANParks preferred option as it will allow for substantial dilution, dissipation and mixing of effluent before reaching the Addo ENP MPA. It will lessen the impact on the highly sensitive and biodiverse area significantly, as the distance from the MPA and islands are increased. The statement below indicates that the concern for water quality within an industrial port, and economic cost is of greater concern to the developers than that of a national protected area.</td><td>The western discharge is not a reasonable and feasible alternative.

Preliminary cost projections for the return of <u>only</u> the Once-Through cooling water a distance of about 12 km from Zone 10S and 10N east of the Port via the N2 to the west of the Port, via two 2.5 metre diameter Glass-fibre Reinforced Plastic (GRP) pipelines and associated pumps, are as follows:

<table>
<tr><td>Capital cost (12 km pf pipelines and pumps)</td><td>R 1 250 000 000</td></tr>
<tr><td>Annual operating cost (monitoring and maintenance)</td><td>R 130 000 000</td></tr>
<tr><td>Annual energy cost (pumping)</td><td>R 98 550 000</td></tr>
<tr><td>Operating cost 20 year life (monitoring and maintenance)</td><td>R 2 600 000 000</td></tr>
<tr><td>Energy cost 20 year life (pumping)</td><td>R 1 971 000 000</td></tr>
<tr><td>TOTAL CAPITAL AND OPERATING COST OVER 20 YEAR LIFE</td><td>R 5 821 000 000</td></tr>
<tr><td>Annual carbon footprint (tCO_2e = tons of CO_2 equivalents)</td><td>94 608 tCO_2e</td></tr>
<tr><td>Carbon footprint 20 year life</td><td>1 892 160 tCO_2e</td></tr>
<tr><td>Annual cost of carbon @ R100 per ton</td><td>R 9 460 800</td></tr>
<tr><td>Cost of carbon @ R100 per ton over 20 year life</td><td>R 189 216 000</td></tr>
</table>
</td></tr>
</table>

I&AP	COMMENT	RESPONSE
SANParks	The EIA process should emphasise the Environmental Impacts of various options, which does not appear to have been adequately addressed in the documentation provided. One concern raised about a more westerly discharge is potential elevation of metals in the harbour, yet no such concern is being raised about heavy metal accumulation in the MPA.	**It should be noted that the location of the discharge servitude west of the Port was identified as **'not viable'** for the construction of the proposed servitude for the following reasons:* • *Effluent will need to be pumped around the perimeter of the Port which would result in significantly higher capital and operational costs compared with an eastern discharge.* • *Although the required dilutions can be achieved, discharges west of the Port at -10 m will enter the Port, which increases the risk of accumulation of particulates with associated nutrients and heavy metals. If the pipeline is extended to -16 m, the achieved dilutions reduce the risk of effluent entering the Port. However, there is still a risk of accumulation of particulates with associated nutrients and heavy metals.* *Based on personal communication with the Economic Specialist, the cost of constructing a discharge servitude from the ADZ to the western side of the Port will make the project economically unfeasible. This will result in each investor having to establish their own independent dedicated discharge servitude which will likely have a greater negative environmental impact on Algoa Bay. An economic assessment is currently in process to confirm this finding and will be submitted as part of the EIA documentation. See provisional estimates above.* *The concern about heavy metal accumulation in the MPA was not raised as this is highly unlikely to occur. Effluent gets trapped in the Port which allows for the accumulation of particulates over time as discharge continues. This is not the case for the MPA, i.e. effluent does not get trapped, it gets diluted and dispersed.*
SANParks	Further, the report states that the effluent should not impact on the water quality needed for the abalone farm, the intake infrastructure situated east and down current from the effluent outfall. Using the site west of the port will reduce this risk substantially.	*Modelling showed that there is no impact on the abalone intake from the discharge infrastructure. This issue was taken into consideration prior to modelling being undertaken.*

I&AP	COMMENT	RESPONSE
SANParks	During the meeting on the 8 December, the Consultant indicated that assessment of Biodiversity vs Economic value will be conducted. SANParks requests that the balance between economic development and the environment will be considered, and the long term impact of degraded water quality on marine tourism income, impacted ecosystems and the possible loss of species, and species feeding areas, impacts on local fisheries taken into account.	*The economic study is in progress and will be included in the EIAr.* *See provisional capital and operational estimates above.* *Please note that based on the marine modelling report, as well as the Environmental Risk Assessment conducted by Lwandle, as well as the number of available mitigation measures, such as land based treatment of effluent from the WWTW prior to discharge, there is no evidence that the proposed project will result in any long term degradation of water quality.*
SANParks	In the previous application it was indicated that CDC will be responsible for monitoring the adherence to water quality standards at the outfalls, however it is now indicated that each individual developer will be responsible for monitoring tis own water quality. With several industries contributing to the effluent it leaves room for different interpretations in the case of contravention. The applicant in this project will not be held accountable for the effluent emanating from the applicants infrastructure.	*The CDC will be the owner of the infrastructure and responsible for all mitigation and monitoring measures included in the EIA, EMPRs and EA (if issued by DEFF). The CDC will also need to adhere to the conditions tied to the Coastal Waters Discharge Permit to be issued by DEFF: Oceans and Coasts. Each individual investor will need to keep records with regards to what is discharged into the discharge pipelines and this needs to be available to the CDC at all times. All conditions in the Coastal Waters Discharge Permit to be issued to the CDC will also apply to individual investors that will make use of the discharge infrastructure.*
SANParks	SANParks requests DEFF to establish a single monitoring body, and that SANParks are consulted in the issuing of any coastal waters discharge permit for effluent into the Addo ENP MPA. SANParks also requests that any future coastal discharge permits for effluent discharge through the applicant's infrastructure be linked to the applicant's Environmental authorisation. The future coastal discharge permits and this application cannot be seen as separate and are intrinsically linked.	*This is the mandate of DEFF Oceans and Coasts and as such the EAP cannot provide a response in this regard.*

I&AP	COMMENT	RESPONSE
SANParks	In both the report and the Consultant presentation emphasis was placed on sensitivities in the terrestrial environment, yet comparatively little mention is made of the marine environment, and the potential impact of the proposed developments on marine biota and processes. It almost appears as if because the regulations permit discharge of effluents into the marine environment no significant consideration is given of the impact of the effluent discharge on the marine environment, and options presented highlighting how these effects could be minimised or mitigated through system design, placement etc.	*This is not the case. The sensitivity of the marine environment is highlighted in section 5.6 of this report. In addition, the marine dispersion modelling took into account marine sensitive areas and as such an environmental risk assessment to support the dispersion modelling was undertaken as part of this process. Furthermore, a marine ecological assessment is currently being conducted and will be available for review by SANParks during the EIA Phase of this development.*
SANParks	There needs to be a clear indication of all potential pollutants from the various industries including all chemicals used in reverse osmosis plants, as well pharmaceutical products (hormones, antibiotics etc) used in aquaculture, and explanations given on if and how these were incorporated into the dispersion models. What standards were used to define acceptable concentrations in the marine environment, and what approach was used in determining possible impact for compounds for which no national standards exist.	*Only the constituents provided by CDC have been included in the assessment. Should additional constituents be added to the effluent streams or identified in future, then the end-of-pipe concentrations of these constituents will need to be limited based on the achieved dilutions from the dispersion model and the applicable guidelines, using the precautionary principle in cases where marine water quality guidelines for these constituents are not clear.* *The power plant and desalination plant designers must ensure that any co-discharges meet the applicable water quality guidelines at end-of-pipe, thus ensuring that temperature and/or salinity are the limiting constituents in these effluents, e.g. the World Bank specifies an average free chlorine of 0.2 mg/l at end of pipe (IFC, 2007).*
SANParks	There is obvious concern about discharges in close proximity to St Croix Island, and how this may impact seabirds, notably penguins, dependant on this area of the ocean, and their prey species. Options for more removed positions of discharge outlets away from the island need to be considered.	*A marine ecological assessment is currently being conducted and will be available for review by SANParks during the EIA Phase of this development. The distance of each proposed marine discharge servitude from St Croix Island is as follows:* *Cooling water from the proposed power stations: 5.3 km* *Brine, Finfish, Phase 2 effluent: 3.5 km* *Abalone effluent: 4.1 km*

I&AP	COMMENT	RESPONSE
SANParks	Scoping report deals mostly with effluent discharges with no significant consideration given to the likely impact of the actual construction or placement of infrastructure, in terms of both actual disruptions to the sea floor as well as well as disturbance, pollution etc during construction. Mitigation of these impacts also needs to be considered in the discussion of more than one option and locality.	*Construction phase impacts are included in Chapter 6 of this report. These impacts will be expanded upon in the EIR Phase of the proposed development.*
SANParks	SANParks requests that the applicant provide models for infrastructure failure scenarios supported by contingency plans for the different structures in the case of their failure. By nature of the position of this infrastructure, any failure could impact the marine environment of Algoa Bay and the Addo ENP MPA severely.	*This issue is acknowledged and valid and has been forwarded to the Coega Project Team. The team is currently in the process of compiling different scenarios for inclusion in the EIR.*
SANParks	SANParks requests that the applicant provide a monitoring and maintenance plan, and schedule for the proposed infrastructure.	The Scoping Report has identified risks/environmental impacts for further assessment at EIA stage. Emergency/mitigation measures will be listed at EIA stage. **Mitigation measures currently include the following:* *The pump stations will have a built-in safety mechanism in the event of loss of pressure.* *Regular maintenance inspections* *Additional emergency / mitigation measures will be explored in the EIA Phase if required.*
SANParks	Modelling should include both effluent outfall sites west and east of port	**Modelling did incorporate options both west and east of the Port as well as in the Port itself. This was included in the 2016 PRDW Concept Design Report. This report can be circulated to SANParks upon request. In addition, in 2017, PRDW conducted a marine dispersion modelling exercise where 12 marine effluent discharge scenarios were developed and then modelled for the defined range of potential effluents. In addition to these 12 scenarios, 3 more scenarios were inferred from results of the modelled scenarios from six (6) sites:* • *Option 1 – Approximately 2 km south-west of the western breakwater, at 10 m depth;* • *Option 2 – Approximately 2 km south-west of the western breakwater, at 16 m depth;*

I&AP	COMMENT	RESPONSE
		• *Option 3 – Along the seaward side of the eastern breakwater, with the discharge point at the elbow of the breakwater;* • *Option 4 – Along the seaward side of the eastern breakwater, with the discharge point at the end of the breakwater;* • *Option 5 – Approximately 900 m to the north-east parallel to the eastern breakwater, at 10 m depth; and* • *Option 6 – Approximately 900 m to the north-east parallel to the eastern breakwater, at 20 m depth.* *The dispersion modelling analysed the mixing zones of 100 m and 300 m from the discharge point. Water quality guidelines were also applied at locations of sensitive receptors, including the boundary of the Addo Elephant Marine Protected Area (MPA), 300 m from the boundary of the MPA, Jahleel Island, 100 m from Jahleel Island and the Port of Ngqura entrance.* *The location of the discharge servitude west of the Port was identified as* ***'not viable'*** *for the construction of the proposed servitude for the following reasons:* • *Effluent will need to be pumped around the perimeter of the Port which would result in significantly higher capital and operational costs compared with an eastern discharge.* • *Although the required dilutions can be achieved, discharges west of the Port at -10 m will enter the Port, which increases the risk of accumulation of particulates with associated nutrients and heavy metals. If the pipeline is extended to -16 m, the achieved dilutions reduce the risk of effluent entering the Port. However, there is still a risk of accumulation of particulates with associated nutrients and heavy metals.* *This report can also be made available to SANParks on request.*
SANParks	Address the impact of increased water temperature and nutrients and the likelihood of regular Harmful algal blooms (HABs) occurring in the Bay and MPA.	*A marine ecological assessment is currently being conducted and will be available for review by SANParks during the EIA Phase of this development. This study will address all possible impact on the marine environment as a result of effluent discharge, including the impact of increased water temperature and nutrients.*
SANParks	Impact of effluent on the water turbidity, and turbidity dispersion	*A marine ecological assessment is currently being conducted and will be available for review by SANParks during the EIA Phase of this development. This study will address all possible impact on the marine environment as a result of effluent discharge.*

I&AP	COMMENT	RESPONSE
SANParks	Temperature and turbidity impacts on plankton, the pelagic food web and small pelagic fish species	*A marine ecological assessment is currently being conducted and will be available for review by SANParks during the EIA Phase of this development. This study will address all possible impact on the marine environment as a result of effluent discharge.*
SANParks	Accumulation of discharge elements in the sediments and benthic habitats and associated impacts	*A marine ecological assessment is currently being conducted and will be available for review by SANParks during the EIA Phase of this development. This study will address all possible impact on the marine environment as a result of effluent discharge.*
SANParks	We note that scenarios of noncompliance from Coastal discharge permit holders will be modelled	The modelling addressed the worst case scenario and characterised the extent and duration for which there might be non-compliance with the required dilutions governed by applicable water quality guidelines and / or the water quality requirements of other users in the region

I&AP	COMMENT	RESPONSE
SANParks	Additional information on the storm water structures should be provided. How much of the storm water will be from the industrial stands and how much will come from runoff from roads, etc. Storm water should ideally be discharged onto land (e.g. onto an artificial wetland) as opposed to on a beach. Can the proposed open space areas at the site not be used for this purpose? Is it not possible to have small grassy areas where water can flow onto from the storm water outlets (even if it is landward of the roads mentioned – the water from higher up can then flow onto these areas, thus reducing the amount of water potentially discharged onto the beach)? The possibility of pollutants (oil and fuel from vehicles, domestic, etc.) entering the marine environment from storm water runoff is extremely high without proper mitigation, especially after first rains, therefore beach discharge should be considered a last resort. Also, if discharge onto land is not possible, is it possible to discharge the storm water with the one of the other pipelines / tunnels into the ocean if treated to acceptable standards (e.g. the South African Water Quality Guidelines for Coastal Waters – Volumes I and II, whichever is more stringent) before being discharged (there are various options, the CoCT are exploring some of these).	*This information will be provided in the EIA Phase as the final designs for stormwater infrastructure are still in progress.*
SANParks	The municipality should be made aware that discharges onto beaches could affect applications for blue flag status for beaches and could impact use of beaches (localised erosion, hard structures on sandy coastlines, functioning of dune systems, etc.).	*The local municipality is included in the stakeholder database and as such are aware of the project and have access to the Scoping Report.*

I&AP	COMMENT	RESPONSE
SANParks	If the gabions are to be built on sandy beaches I would also not support their use as they limit coastal access (if it extends to the HWM) and they could potentially change the nature of the beach (erosion / accretion of sediment) if placed incorrectly.	*This information will be provided in the EIA Phase as the final designs for stormwater infrastructure are still in progress.*
SANParks	SANParks are concerned about the proposed impacts of these projects, as well as those environmental impacts not taken into consideration. Addo Elephant National Park MPA is the last stronghold of the African Penguin in the world and any further cumulative impacts can add to the pressures on this species.	*Please note that the impacts above (i.e. increased water temperature and nutrient on the persistence of harmful algal blooms, impact of effluent on water turbidity and turbidity dispersion, temperature and turbidity impacts on plankton, the pelagic food web and small pelagic fish species, accumulation of discharge elements in the sediments and benthic habitats and associated impacts) will be included in the marine ecological assessment currently being conducted for the proposed project. This document is an integral part of the EIA process as these impacts need to be assessed by a qualified marine ecologist.*
SANParks	SANParks requests the Department of Environment, Forestry and Fisheries to carefully consider the number of power stations as well as the location of these plants, the likely impacts on and the adjacency of the Addo Elephant National Park and MPA.	*This is the mandate of DEFF and as such the EAP cannot provide a response in this regard.*
Comments received from SAHRA on the 15th of December 2020 regarding the Draft Scoping Report		
SAHRA	SAHRA has noted a few inaccuracies in the Draft Scoping Report which need to be addressed in any subsequent documents. The table under Section 6.3 Assessment of Issues lists potential issues and possible mitigation measures. In the table on page 138 under the Issue of Impacts on Archaeological, Palaeontological and Cultural Sites, the mitigation measure reads “Should any archaeological or cultural sites or objects be located during the construction of the proposed project, it should immediately be reported to the National Heritage Council. Failure to report a site or object of archaeological and/or cultural significance is a contravention of the National Heritage Act (Act No. 25 of 1999)”	*Thank you, this has been corrected*

I&AP	COMMENT	RESPONSE
	The responsible agency is SAHRA and not the National Heritage Council so this section needs to be revised to reflect that any discoveries must be reported to SAHRA.	

6. IDENTIFICATION OF POTENTIAL IMPACTS

6.1 INTRODUCTION

CES has developed a revised rating scale for the Scoping Phase of the EIA process in accordance with the requirements outlined in Appendix 2 of the EIA Regulations (2014 and subsequent 2017 amendments). This scale takes into consideration the following variables:

- Significance
- Consequence
- Extent
- Duration
- Probability
- Reversibility and Mitigation

It is however important to note that impacts are assessed and rated on a broader issues level, and are regarded as preliminary. This is because, at the Scoping Phase of the EIA process, a limited amount of information on project related detail is available, and baseline data on the project affected environment and social systems has not yet been gathered. Rating specific impacts requires input from a number of specialist assessments, which are only completed after the Scoping Phase. Thus, a definitive assessment of project specific impacts cannot be completed at the Scoping Phase, and our interpretation of the new requirements is that the environmental and social consequences of the project and alternatives needs to be discussed more broadly than what is required in the EIR. This we refer to as an issues level assessment.

6.2 ISSUES IDENTIFICATION MATRIX

Six factors are considered when assessing the significance of the identified issues, namely:

1. ***Significance*** - Each of the below criterion (points 2-6 below) are ranked, as presented in Table 6.1 to determine the overall significance of an activity. The ranking for the effect (which includes scores for duration; extent; consequence and probability) and reversibility / mitigation are then read off the matrix presented in Table 6.2, to determine the overall significance of the issue. The overall significance is either negative or positive.

2. ***Consequence*** - The consequence scale is used in order to objectively evaluate how severe a number of negative impacts might be on the issue under consideration, or how beneficial a number of positive impacts might be on the issue under consideration.

3. ***Extent*** - The spatial scale defines the physical extent of the impact.

4. ***Duration*** - The temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.

5. The ***probability*** of the impact occurring - The likelihood of impacts taking place as a result of project actions arising from the various alternatives. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development and alternatives. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

6. ***Reversibility / Mitigation*** – The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. The four categories of reversibility used are listed and explained in Table 6.1 below. Both the practical feasibility

of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Table 6.1: Ranking of Evaluation Criteria

EFFECT	**DURATION**	
	Short term	Less than 5 years
	Medium term	Between 5-20 years
	Long term	More than 20 years
	EXTENT	
	Localised	The proposed site and its immediate environs
	Moderate	District / Municipal and Provincial level
	Extensive	National and International level
	CONSEQUENCE	
	Slight	Slight impacts or benefits on the affected system(s) or party(ies)
	Moderate	Moderate impacts or benefits on the affected system(s) or party(ies)
	Severe/ Beneficial	Severe impacts or benefits on the affected system(s) or party(ies)
	PROBABILITY	
	Unlikely	The likelihood of these impacts occurring is slight (low probability)
	May Occur	The likelihood of these impacts occurring is possible (high probability)
	Definite	The likelihood is that this impact will definitely occur
REVERSIBILITY / MITIGATION	**REVERSIBILITY / MITIGATION**	
	Easily achievable	The impact can be easily, effectively and cost effectively mitigated/reversed
	Achievable	The impact can be effectively mitigated/reversed without much difficulty or cost
	Difficult	The impact could be mitigated/reversed but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs
	Very Difficult	The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly

In certain cases it may not be possible to determine the severity of an issue at this stage and thus it may be categorised as: Don't know/Can't know

The above criteria are used to determine the overall significance of an activity. The impact effect (which includes duration; extent; consequence and probability) and the reversibility/mitigation of the impact are then read off the significance matrix in order to determine the overall significance of the issue (Table 7.2). The overall significance is either negative or positive and will be classified as low, moderate or high (Table 7.3).

Table 6.2: Matrix used to determine the overall significance of the impact based on the likelihood and effect of the impact.

REVERSIBILITY AND MITIGATION	EFFECT			
		MINOR EFFECT	MODERATE EFFECT	SIGNIFICANT EFFECT
	Easily achievable	LOW SIGNIFICANCE		
	Achievable		MODERATE SIGNIFICANCE	
	Difficult			HIGH SIGNIFICANCE
	Very Difficult			

Table 6.3: Description of Issues Level Significance Ratings and associated range of scores

SIGNIFICANCE RATE	DESCRIPTION
Low	The impacts on this issue are acceptable and mitigation, whilst desirable, is not essential. The impacts on the issue by themselves are insufficient, even in combination with other low impacts, to prevent the development being approved. Impacts on this particular issue will result in either positive or negative medium to short term effects on the social and/or natural environment.
Moderate	The impacts on this issue are important and require mitigation. The impacts on this issue are, by themselves, insufficient to prevent the implementation of the project, but could in conjunction with other issues with moderate impacts, prevent its implementation. Impacts on this particular issue will usually result in either a positive or negative medium to long-term effect on the social and/or natural environment.
High	The impacts on this issue are serious, and if not mitigated, they may prevent the implementation of the project (if it is a negative impact). Impacts on this particular issue would be considered by society as constituting a major and usually a long-term change to the (natural and/or social) environment, and will result in severe effects or if positive, substantial beneficial effects.

The ***issues level environmental significance*** scale needs to take the context into account, and must be applied at the relevant level. For example, if the issue under consideration is "*changes to the terrestrial biological environment*", the impacts to be considered when assessing this issue might include (1) loss of a particular vegetation type, (2) disruption to, or loss of, faunal habitats, (3) fragmentation of habitats (4) loss of species of conservation concern (if known at the Scoping stage of the assessment, and so on). The evaluation of the significance of the issue therefore relies heavily on the information that is available at the Scoping stage and, out of necessity, must be broad and value laden. For this reason, impacts need to reflect the values of the affected society.

Prioritising

The evaluation of the issues, as described above, is used to prioritise which issues require mitigation measures, or which issues might lead to a conclusion that the particular alternative under assessment is not appropriate.

Negative issues that are ranked as being of "**HIGH**" significance will need to be investigated further to determine how the impacts can be minimised, or what alternative activities or mitigation measures can be implemented.

For issues identified as having a negative impact of "**MODERATE**" significance, it would be standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigation measures will then be proposed.

For impacts ranked as "**LOW**" significance, no investigations or alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

6.3 ASSESSMENT OF ISSUES

The table below shows the issues identified at the Scoping level for the **preferred alternative** described in the Alternatives Section 2.4 of this scoping report and presents the results of the assessment using the approach described above. It also presents possible mitigation measures at a high level, and the residual impact associated with the issue.

ISSUE	ALTERNATIVE	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK
	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
IMPACTS ON THE PHYSICAL ENVIRONMENT										
TERRESTRIAL IMPACTS										
Impacts on topography and bathymetry *(design, construction and decommissioning phase)*	Preferred alternative	It is envisaged that changes to the terrestrial topography of certain localities within the study area will be required during the construction of the land-based activities associated with the proposed project, especially along areas of the coastline where intake and outfall infrastructure will be constructed. In addition, there are likely to be minor changes to the bathymetry of the intertidal and subtidal areas following the proposed infrastructure to be constructed on the sea bed.	**MODERATE –**	Slight	Study Area	Permanent	Definite	Very Difficult	• The seawater abstraction and discharge pipeline infrastructure should be designed to limit impacts on topography and bathymetry. • Excavations and changes to the topography and bathymetry of the site should be kept to the minimum required for construction; • Previously disturbed areas must be utilised wherever possible; and • The general profile of the landscape as well as the sea-floor must be retained as far as practically possible.	**MODERATE –**
	No-Go	The topography and bathymetry within the terrestrial portion of the proposed project area have been impacted on by numerous developments within the Coega SEZ, especially the Port of Ngqura as well as the Sunshine Coast quarry located in Zone 10.	**MODERATE –**	Slight	Study Area	Permanent	Definite	Not Applicable	• Not Applicable	**MODERATE –**
Impacts on land use *(construction, operational and decommissioning phase)*	Preferred alternative	The land-based activities associated with the proposed project will fall within an existing industrial zone (the Coega SEZ) and thus is in line with the proposed land use of the area. Zone 10 of the Coega SEZ is earmarked for aquaculture and, because the proposed development is essential to the functionality of the aquaculture development zone (ADZ), the development and operation of the proposed marine infrastructure servitude will be beneficial to the land use of the area.	**HIGH +**	Beneficial	Study Area	Long Term	Definite	Not Applicable	• None required	**HIGH +**
	No-Go	The no-go option will result in land allocated for aquaculture not being utilised for this purpose as a result of insufficient (or lack of) intake water.	**MODERATE –**	Moderate	Study Area	Permanent	Definite	Not Applicable	• Not Applicable	**MODERATE –**
Soil Contamination and Erosion *(design, construction, operation and decommissioning phase)*	Preferred alternative	The construction of the land-based infrastructure associated with the proposed servitude will require the clearing of vegetation which will result in exposed soil surfaces and thus the potential for soil erosion. In addition, the utilisation of construction vehicles and other construction machinery during the construction phase could result in soil contamination within the area. During the operational phase, any leaks derived from the	**LOW –**	Moderate	Localised	Short Term	May Occur	Achievable	• The seawater abstraction and discharge pipeline infrastructure should be designed to limit risks of erosion. • During construction, disturbance and clearing of natural vegetation should be kept to the minimum required for construction; • Newly cleared and exposed areas must be promptly rehabilitated with indigenous vegetation to avoid soil erosion. Where necessary, temporary	**LOW –**

ISSUE	ALTERNATIVE	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK
	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
		infrastructure associated with the discharge of effluent could result in soil contamination within the study area.							stabilization measures must be used until vegetation re-establishes; • Plan for the worst case, that is, for heavy rainfall and runoff events, or high winds; • Care must be taken to ensure that runoff is well dispersed so as to limit erosion; • Construction vehicles and equipment must be inspected for leaks on a daily basis. Any leaks must be immediately repaired at an offsite location; • All hydrocarbons and chemicals must be stored on impermeable surfaces with appropriately-sized containment bunds; and • Spill kits must be available at all locations where chemicals of hydrocarbons are stored, handled or used, and spills must be cleaned up immediately in accordance with an established protocol appropriate to the material in question.	
	No-Go	Due to the nature of the Coega SEZ (an industrial development area), there are a number of areas that have previously been eroded and/or contaminated during construction of various infrastructure.	**MODERATE –**	Slight	Study Area	Permanent	Probable	Not Applicable	• Not Applicable	**MODERATE –**
Impacts on Surface and Groundwater Resources *(design, construction, operational and decommissioning phase)*	Preferred alternative	Various substances may result in the pollution of surface and groundwater resources. Construction activities may lead to sediment being deposited into drainage lines, wetlands and other water bodies, including the potential for seepage into groundwater resources. Pollution from litter and general construction waste may occur due to improper site management. Washing of vehicles and equipment may result in the pollution of drainage lines, and other water bodies, and pollution may occur being a consequence of poor vehicle maintenance and improper storage of hazardous materials such as fuel, etc. Operational activities could result in the pollution of surface and groundwater resources following the discharge of treated effluent, leakages from discharge infrastructure and hazardous chemical spill during maintenance activities.	**MODERATE –**	Severe	Study Area	Long Term	May Occur	Achievable	• The discharge infrastructure should be developed as far away from existing watercourses as is practically feasible; • All chemicals of all types must be stored on impermeable surfaces in secure, bunded and designated storage areas; • Cement must be stored on impermeable storage areas protected from the rain and mixed only in designated areas. Concrete residues must be cleaned up immediately; • Vehicle repairs, servicing, refuelling and washing must be done only in designated areas underlain by impermeable surfaces with appropriately-sized containment bunds and grease traps; • Where it is necessary to service, repair or refuel a vehicle or item of plant on site, drip trays must be used to catch drips, spills and leaks; • Effluent discharge must be continuously monitored to ensure that water quality meets the required national and international standards (whichever is more stringent); and	**LOW –**

ISSUE	ALTERNATIVE	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK
	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
									• Surface and groundwater quality monitoring should be conducted to determine if any pollution has occurred as a result of the proposed development.	
	No-Go	Due to the nature of the Coega SEZ (an industrial development area), surface and groundwater pollution has potentially occurred as a result of other existing industrial activities within the area.	**MODERATE –**	Severe	Study Area	Permanent	May Occur	Not Applicable	• Not Applicable	**MODERATE –**
MARINE IMPACTS										
Impact on Seawater Quality (construction, operational and decommissioning phase)	Preferred alternative	Construction of the proposed marine infrastructure, which will likely include blasting, which will result in sediment plumes leading to increased turbidity of the seawater and potentially smothering marine biota. During the operation of the project, the discharge of treated effluent into the marine environment could reduce the quality of the seawater and could impact on sensitive habitats associated with marine biota. This is especially pertinent with regards to the proximity of the Addo Elephant National Park MPA. Potential pollutants include nutrients (e.g. ammonia, nitrates and nitrates), which may be derived from the effluent from the WWTW and ADZ and brine from desalination facilities. In addition, the discharge of effluent from the G2P projects could result in increased seawater temperatures, which will in turn have impacts on the available oxygen and the several indirect impacts on the biota that rely on specific seawater quality parameters.	**HIGH –**	Very Severe	Study Area	Long term	May Occur	Difficult	• Blasting technology used during the construction phase should be non-noxious and preferably suited to producing courser fragmentation of the rock in order to avoid a large sediment plume; • The effluent discharge point should be located as far as practically possible from the Marine Protected Area; • All industries that will be utilising the discharge infrastructure must undergo rigorous monitoring of treated effluent in order to ensure that the discharge water meets the minimum regulatory standards and permit requirements (e.g. CWDP) prior to entering the discharge infrastructure; and • The recommendations of the marine dispersion modelling, which will be presented as part of the EIA process, must be adhered to when finalising the layout and operational standards for the discharge of water.	**MODERATE –**
	No-Go	There is currently discharge of treated and untreated effluent occurring at several locations along the Algoa Bay coastline. Should the proposed marine infrastructure servitude not be developed, the various industries within the Coega SEZ could apply for separate discharge pipelines, which is likely to result in numerous cumulative seawater impacts.	**HIGH –**	Very Severe	Study Area	Long term	Probable	Not Applicable	• Not Applicable	**HIGH –**
Change in Marine Sediment Dynamics and Wave Action	Preferred alternative	The design and placement of solid structures within a dynamic coastal environment is likely to result in changes to the sediment dynamics and localised currents in the study area. In addition, the construction of	**MODERATE –**	Moderate	Regional	Long term	May Occur	Very Difficult	• The seawater abstraction and discharge pipeline infrastructure must be designed and planned to minimise the impacts on the marine and coastal sediment dynamics.	**LOW –**

ISSUE	ALTERNATIVE	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK
	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
(design, construction, operational and decommissioning phase)		infrastructure in the surf zone could result in changes to the wave action along the shoreline. Changes to the sediment dynamics and wave action of the coastal zone could result in increased erosion or deposition along this section of the coastline and could also have several impacts on the marine biota that rely on specific sediment characteristics.							• Technology used during the construction of the marine infrastructure must be considered in terms of the sediment plume that may result from blasting and other activities. An effort must be made to reduce the sediment plume resulting from construction; • An oceanography specialist must be consulted to provide input on the likely effects on localised currents and wave action (if any) derived from the proposed development; and • The placement of large infrastructure between the low water mark and the highwater mark, should be avoided wherever practically possible.	
	No-Go	This section of Algoa Bay has been significantly altered by the development of the Port of Ngqura. The existence of the Port's breakwaters as well as the marine traffic in the surrounding area currently has a significant influence on the marine sediment dynamics. Should the development not go ahead, alternative options may be used for abstraction of seawater and discharge of effluent, resulting is additional changes to the sediment dynamics in the area.	**MODERATE –**	Slight	Regional	Permanent	Probable	Not Applicable	• Not Applicable	**MODERATE –**
Disturbance of the Coastal Zone and Loss of Coastal Public Property *(design, construction, operational and decommissioning phase)*	Preferred alternative	The design of the proposed marine servitude infrastructure could impact on physical coastal habitats for biota such as bird habitats. Construction of the proposed marine infrastructure servitudes will require movement of construction vehicles and machinery within the coastal zone. This could if not managed correctly. Once operational, the servitude(s), will extend across a portion of coastal public property (CPP), and will therefore need to be protected from public access, thus reducing the beach amenity and CPP access in the area.	**MODERATE –**	Slight	Study Area	Long Term	Definite	Achievable	• The seawater abstraction and discharge pipeline infrastructure and layouts must be designed to minimise impacts on physical coastal habitats. • The use of vehicles in a coastal protection zone may require a permit (coastal lease) from the Coastal Conservation and Strategies Directorate of the DEFF, Oceans and Coast Branch (DEFF Oceans and Coasts); • Construction activities taking place within the coastal protection zone must be limited to minimum area required for the purposes of construction; • The Contractor must ensure that all areas where construction vehicles will be working are thoroughly investigated for bird eggs and other faunal habitats prior to commencement of construction; • The area where construction will be taking place must be clearly demarcated and no construction	**LOW –**

ISSUE	ALTERNATIVE	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK
	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
									vehicles, machinery or staff will be allowed outside of the demarcated area; and • The marine infrastructure servitude(s) must preferably be located at a previously disturbed area along the coastline and must be kept to a minimum width in order to ensure that no unnecessary loss of coastal public property is incurred. • SANParks must be granted 24hr access to the coast through the development zone for monitoring purposes.	
	No-Go	This section of Algoa Bay has been significantly altered by the development of the Port of Ngqura. A large section of the coastline has already been disturbed and a significant portion of coastal public property has been lost. Should the proposed development not go ahead, alternative options may be used for abstraction of seawater and discharge of effluent, which may require additional disturbance of the coastal zone and, potentially, the loss of additional coastal public property.	**MODERATE –**	Slight	Study Area	Permanent	Definite	Not Applicable	• Not Applicable	**MODERATE –**
IMPACTS ON THE BIOLOGICAL ENVIRONMENT										
TERRESTRIAL IMPACTS										
Disruption to Terrestrial Ecosystems (design, construction and decommissioning phase)	Preferred alternative	The design of the proposed marine servitude infrastructure could impact on coastal biota such as bird populations. During the construction phase there will be impact on the natural vegetation including clearing of, or damage to, indigenous coastal vegetation, the removal of intact communities, loss of species of special concern and/or trees protected in terms of the National Forest Act. In addition, the proposed development may result in the introduction of alien species.	**MODERATE –**	Severe	Study Area	Long Term	Probable	Achievable	• Land-based pipeline infrastructure and layouts must be designed to minimise impacts on natural coastal biota. • Work areas must be clearly demarcated so that construction workers limit their impact to these areas alone; • Rehabilitation and landscaping to be done with indigenous plant species, in accordance with the CDC's Project Vegetation Specifications. • All construction vehicles must stay on single demarcated access tracks to avoid compaction of sand, soil and roots; • Rehabilitation should be undertaken in a progressive manner. Re-vegetation of the disturbed areas with indigenous material should be undertaken as soon as construction activities at an individual site have been completed; • Only indigenous vegetation that occurs naturally on site is to be planted during site rehabilitation and in landscaping	**LOW –**

ISSUE	ALTERNATIVE	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK
	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
									activities; and • All alien vegetation must be removed from site in accordance with the CDC Alien Eradication Programme. • The CDC must ensure that the Duthies golden mole and Pygmy hairy-footed gerbil occurring in the dune habitats in the Coega area are included in the relocation and management plan to the satisfaction of the relevant provincial environmental department.	
	No-Go	Currently there is invasive alien vegetation within the proposed development area, however the CDC currently has an eradication programme in place.	**MODERATE –**	Moderate	Study Area	Permanent	Probable	Not Applicable	• Not Applicable	**MODERATE –**
MARINE IMPACTS										
Disruption to Intertidal or Sub-Tidal Biota (design, construction, operational and decommissioning phase)	Preferred alternative	The design and construction of the marine infrastructure servitudes could result in the disturbance of intertidal and subtidal areas, resulting in mortalities to marine fauna and flora located within the area. The subtidal reefs offshore of the proposed project area contain habitats of a number of important fish and shellfish species. Noise resulting from the drilling and blasting activities associated with construction will disturb marine fauna and could affect the navigation, communication and sensory systems of some species. During operation, it is possible that several smaller marine species could be entrained in the abstraction infrastructure during the abstraction of seawater.	**HIGH –**	Severe	Study Area	Long Term	Probable	Difficult	• The seawater abstraction and discharge pipeline infrastructure should be designed to limit impacts to marine biota. • Protected marine flora and fauna (if any exists) must be relocated outside of the proposed construction area once the relevant permits have been obtained; • Blasting activities must be limited to a maximum of one blast per day; • An appropriately sized screen/mesh must be placed at the inlet to the abstraction pipelines; • The speed of the inlet water pump should be operated at the minimum possible velocity to avoid the entrainment of smaller marine species; and • All recommendations made by the marine specialist must be adhered to throughout construction of operation of the abstraction and discharge infrastructure.	**MODERATE –**
	No-Go	The continued operation of the Port of Ngqura implies that marine fauna and flora within (and in close proximity to) the port are constantly disturbed. Should the proposed development not go ahead, alternative options may be used for abstraction of seawater and discharge of effluent, which may result in further disturbance of marine biota.	**MODERATE –**	Moderate	Study Area	Permanent	Definite	Not Applicable	• Not Applicable	**MODERATE –**
GENERAL IMPACTS AND IMPACTS ON THE SOCIO-ECONOMIC ENVIRONMENT										

ISSUE	ALTERNATIVE	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK
	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
Waste Management *(construction, operational and decommissioning phase)*	Preferred alternative	Solid waste associated with construction activities such as building rubble, (e.g. excavated material, brick off cuts, packaging, waste concrete etc.). Littering on site may result in non-biodegradable material entering the marine environment. Plastic bags, bottles, rope and other litter could have a direct impact on marine fauna resulting in the death of marine life. Solid waste from the operational phase could be derived from maintenance activities and could include dead organic material from the intake infrastructure and inlet screens. Liquid waste will be discharged into the marine environment via the discharge infrastructure and incorrect treatment of the waste could impact seawater quality.	**MODERATE –**	Severe	Study Area	Long Term	May Occur	Difficult	• Construction material should be reused or recycled wherever possible; • Waste that cannot be reused or recycled should be disposed of in the correct manner at the nearest registered waste disposal site; • Any hazardous materials (e.g. paint, fuel or oil) must be disposed of immediately and in the correct manner; • General good house-keeping should be practiced on site; • Topsoil and spoil to be managed in accordance with the CDC's Environmental Specifications for Construction. • Litter must be controlled during construction (e.g. adequate bins must be made available on site at all times); • Construction materials stored as part of the project must be secured (i.e. plastics must be covered to prevent being blown off site). Skips must be regularly emptied and must be covered; and • All industries that will be utilising the discharge infrastructure must undergo rigorous monitoring of treated effluent in order to ensure that the discharge water meets the minimum regulatory standards and permit requirements (e.g. CWDP) prior to entering the discharge infrastructure.	**LOW –**
	No-Go	The CDC has a waste management plan in place, as such there is currently no evidence of littering on site.	**LOW –**	Moderate	Study Area	Permanent	Definite	Not Applicable	• Not Applicable	**LOW –**
Health and Safety (construction, operational and decommissioning phase)	Preferred alternative	Health and safety aspects will mostly pertain to activities defined under the Occupational Health and Safety Act (Act No. 85 of 1993). Work occurring throughout the proposed development will consist of health and safety risks.	**LOW –**	Slight	Localised	Short Term	May Occur	Easily Achievable	• All aspects of the Occupational Health and Safety Act (Act No. 85 of 1993), must be adhered to at all times.	**LOW –**
	No-Go	Within an industrial area there is potential for accidents and health impacts.	**LOW –**	Slight	Study Area	Long Term	May Occur	Not Applicable	• Not Applicable	**LOW –**
Impacts on Archaeological, Palaeontological and/or Cultural Sites *(construction phase)*	Preferred Site	It is possible that sites of archaeological, palaeontological and/or cultural significance are present on or near the proposed development site. This includes marine archaeological sites such as shipwrecks. If these sites are not correctly identified and/or protected	**LOW –**	Moderate	Localised	Permanent	Unlikely	Irreversible	• Should any archaeological or cultural sites or objects be located during the construction of the proposed project, it should immediately be reported to the SAHRA. Failure to report a site or object of archaeological and/or cultural significance is a contravention of the National Heritage Act (Act No. 25 of	**LOW +**

ISSUE	ALTERNATIVE	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK
	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
		prior to construction, this may result in the loss of sites of cultural importance. The correct identification and recovery of sites of archaeological, palaeontological and/or cultural importance could potentially provide a better understanding of the heritage and/or geological history of the area. It is important to note that an Archaeological, Palaeontological and Cultural Heritage Assessment was conducted for the SEZ in 2010. The CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. The CDC's Environmental Specifications for Construction include detailed requirements for the management of heritage in the SEZ, amongst others, the appointment of an archaeologist and palaeontologist during the construction phase of a project.							1999); and • All construction site staff must be briefed to immediately report any sites or objects, which are located during the construction of the facility. In the event of finding what appears to be an archaeological site or a cultural and/or historic site or object, work should be terminated until a qualified archaeologist or historian can examine the item or find.	
	No-Go	If any archaeological and cultural heritage sites are present, these would not be disturbed but would also not be uncovered and therefore not make any contribution to the understanding of the archaeological or cultural heritage of the area.	**LOW –**	Slight	Localised	Permanent	Definite	Not Applicable	• Not Applicable	**LOW –**
Social benefits from the project *(construction, operational and decommissioning phase)*	Preferred alternative	The proposed development will create a number of temporary employment opportunities during the construction phase as well as several permanent employment opportunities during operation for the maintenance of infrastructure.	**LOW +**	Beneficial	Study Area	Short Term	Definite	Easily Achievable	• Utilise local labour as far as possible; and • Construction material must be sourced locally wherever possible.	**LOW+**
	No-Go	Should the project not proceed, no further employment opportunities and tax revenue will be realised.	**LOW –**	Low	Study Area	Short Term	Definite	Not Applicable	• Not Applicable	**LOW–**
Provision of seawater for industrial developments *(operational phase)*	Preferred alternative	The proposed development will result in the abstraction of seawater, which is required for the proposed ADZ, the Gas to Power (G2P) projects and the desalination plant, as well as several other future developments in the Coega SEZ. This will reduce the consumption of municipal water for existing industries and provide some relief to the water scarce area.	**HIGH +**	Beneficial	Regional	Long Term	Definite	Not Applicable	• None required	**HIGH +**

ISSUE	ALTERNATIVE	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK
	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
	No-Go	The current water scarcity in the region will continue placing pressure on the municipality and is likely to give rise to limited attractiveness of the Coega SEZ to investments. The development of the approved ADZ will not be possible should the seawater abstraction not materialise.	**HIGH –**	Moderate	Regional	Permanent	Definite	Not Applicable	• Not Applicable	**HIGH –**
Provision of discharge infrastructure for industrial developments *(operational phase)*	Preferred alternative	The rationale for developing an integrated marine discharge servitude is to have a common user servitude in which a number of possible industries can establish infrastructure required to discharge effluent into the marine environment. The management of the volumes and quality of effluent would be far easier than having several different effluent discharge developments and would streamline the maintenance of infrastructure. The position and depth of the discharge, as well as the release of effluent to the marine environment rather than rivers or estuaries, has potentially less environmental impact due to the increased assimilative and dispersive capacity of the coastal waters.	**HIGH +**	Beneficial	Regional	Long Term	Definite	Not Applicable	• None required	**HIGH +**
	No-Go	The no-go option could result in two possible scenarios namely (1) the establishment of a number of separate different discharge pipelines and infrastructure or (2) a lack of investment in the Coega SEZ as a result of the costs associated with having to establish separate outfall options.	**HIGH –**	Moderate	Regional	Permanent	Definite	Not Applicable	• Not Applicable	**HIGH –**
CROSS CUTTING IMPACTS										
Noise Impacts *(construction and decommissioning phase)*	Preferred alternative	It is anticipated that there will be an increase in the noise levels during the construction phase of the proposed development. Increased noise levels for activities occurring within the marine environment have the potential to significantly impact on marine life.	**HIGH –**	Severe	Study Area	Short Term	Definite	Achievable	• Standard mitigation measures are available to reduce noise; • Blasting activities must be limited to a maximum of one blast per day. • Blasting must e.g. avoid whale periods (especially Southern Right Whale calving periods and Humpback Whale Cow/Calf return migration periods).	**MODERATE –**
	No-Go	As the proposed development site is within an industrial zone, there is existing increased noise levels within the project boundaries.	**LOW –**	Slight	Study Area	Permanent	Definite	Not Applicable	• Not Applicable	**LOW –**
Traffic	Preferred	During the construction phase, large construction vehicles will be utilising	**LOW –**	Slight	Localised	Short Term			• Large slow moving construction vehicles such as front end loaders must	**LOW –**

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	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
(construction and decommissioning phase)	alternative	the existing road network and establishing new access ways to get to the proposed development site. This may result in the impeding of traffic flow and damage to the existing roads. In addition, the construction within the marine environment may require the transportation of materials in and out of the Port of Ngqura.					Probable	Easily Achievable	not be permitted to utilize public roads during peak hours; • Damage to public roads caused by large construction vehicles must be repaired immediately; and • The port authorities must be notified and consulted prior to the commencement of construction.	
	No-Go	The proposed site is within an existing SEZ and thus there are a number of large vehicles that utilise the surrounding road network. In addition, the Port of Ngqura is currently recognised as one of the busiest ports in South Africa.	**MODERATE –**	Moderate	Study Area	Permanent	Definite	Not Applicable	• Not Applicable	**MODERATE –**
Air Quality *(construction and decommissioning phase)*	Preferred alternative	Impacts on air quality during the construction phase will primarily result from increased dust levels associated with the required excavation, vegetation clearing, grading and other construction activities.	**LOW –**	Slight	Study Area	Short Term	Probable	Easily Achievable	• Standard mitigation measures are available to reduce dust during the construction phase.	**LOW –**
	No-Go	As the Coega SEZ is an established industrial area, there are regular developments taking place that could potentially result in increased dust levels as a result of vegetation clearance. In addition, there are a number of industries within the Coega SEZ that operate under an Air Emissions Licence and therefore are permitted to emit certain pollutants into the atmosphere.	**MODERATE –**	Slight	Localised	Long Term	Probable	Not Applicable	• Not Applicable	**MODERATE –**
Visual Impact *(construction, operational and decommissioning phase)*	Preferred alternative	Construction vehicles and equipment will be evident in the existing landscape during the construction phase. Generation of dust will increase the visibility of the project and may become an eyesore if not managed correctly. The visibility of the proposed development may be noticeable and will have a visual impact on the coastal area that is currently undeveloped. However, in relation to the nature of the surrounding industrial zone, it will not be a significant visual transformation to the general landscape of the Coega SEZ.	**LOW –**	Slight	Study Area	Long Term	Possible	Achievable	• Infrastructure finishes should be of appropriate design and quality in keeping with the CDC's Architectural Guidelines; • Infrastructure should be designed in such a way that it fits/blends into the surrounding environment; • Waste must be removed from site regularly and disposed of at a registered landfill site in order to avoid unnecessary litter being viewed on site; and • General good housekeeping must be maintained at all times.	**LOW –**
	No-Go	The existing Port and other Coega SEZ infrastructure has resulted in significant changes to the visual	**MODERATE –**	Moderate	Study Area	Permanent	Definite	Not Applicable	• Not Applicable	**MODERATE –**

ISSUE	ALTERNATIVE	CAUSE AND COMMENT	SIGNIFICANCE OF IMPACT	CONSEQUENCE OF IMPACT	EXTENT OF IMPACT	DURATION OF IMPACT	PROBABILITY OF IMPACT	DEGREE OF REVERSIBILITY AND/OR MITIGATION	MITIGATION MEASURES	RESIDUAL RISK
	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
		landscape of the area.								
Alignment with planning instruments *(construction, operation and decommissioning phase)*	Preferred alternative	The proposed project is in line with the NMBM SDF and the IDP and the Coega SEZ development plans.	**MODERATE +**	Beneficial	Localised	Long Term	Definite	Easily Achievable	No mitigation required	**MODERATE +**
	No-Go	The Coega SEZ would still continue being developed in line with all planning documents								
Climate Change *(construction, operation and decommissioning phase)*	Preferred alternative	Influence of unpredictable / erratic physical conditions and plume dilution and dispersion as well as the placement and integrity of physical structures and/or infrastructure in the dynamic coastal environment.	**MODERATE –**	Moderate	Study Area	Long Term	Possible	Achievable	Climate change needs to be considered in the design of all infrastructure related to the project.	**LOW –**
	No-Go	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CUMULATIVE IMPACTS - Relevant state departments involved with water resource and coastal management (e.g. DWS and DEA: Oceans and Coasts), have advised the CDC that it would be beneficial for the SEZ to have dedicated servitudes for the placement of infrastructure needed for the abstraction of seawater and discharge of treated effluent to the marine environment rather than each industry establishing their own set of infrastructure. This would make management of the volumes and quality of effluent easier, would streamline the maintenance of infrastructure, and would also result in less physical impacts to the coastal environment by reducing the number of points where hard structures are placed in the dynamic coastal zone. As such no other intake and outfall infrastructure is planned in the vicinity of the project and therefore cumulative impacts are unlikely to occur.									
Social benefits from the project *(construction, operational and decommissioning phase)*	Preferred alternative	The functionality of the proposed marine abstraction and discharge servitude will also enable the development of a number of other industries (e.g. G2P, WWTW and the ADZ), which will in the short term result in a number of construction jobs and employment opportunities.	**HIGH +**	Beneficial	Study Area	Short Term	Definite	Easily Achievable	• Utilise local labour as far as possible; and • Construction material must be sourced locally wherever possible.	**HIGH +**
	No-Go	This may also result in a number of investments (e.g. aquaculture companies) not taking off, thus resulting in the loss of several additional potential employment opportunities.	**HIGH –**	Low	Study Area	Short Term	Definite	Not Applicable	Not Applicable	**HIGH –**
Increased pressure on the marine environment of Algoa Bay as a result of discharge effluent and additional hard structures in the dynamic coastal zone *(construction, operational and decommissioning phase)*	Preferred alternative	The design of the proposed marine servitude infrastructure could impact on physical coastal habitats as well as the water quality of the Cerebos intakes.	**MODERATE –**	Slight	Study Area	Long Term	Definite	Achievable	• The seawater abstraction and discharge pipeline infrastructure and layouts must be designed to minimise impacts on physical coastal habitats. • The use of vehicles in a coastal protection zone may require a permit (coastal lease) from the Coastal Conservation and Strategies Directorate of the DEFF, Oceans and Coast Branch (DEFF Oceans and Coasts); • Construction activities taking place within the coastal protection zone must be limited to minimum area required for the purposes of construction; • There must be search and rescue done by a specialist prior to any site disturbance. During construction, it will	**LOW +**

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	(SIGNIFICANCE WITHOUT MITIGATION)								(SIGNIFICANCE WITH MITIGATION)	
									be the ECO's responsibility to ensure that all demarcated construction areas are free of fauna and flora that could be threatened or damaged; • The area where construction will be taking place must be clearly demarcated and no construction vehicles, machinery or staff will be allowed outside of the demarcated area.	
	No-Go	This section of Algoa Bay has been significantly altered by the development of the Port of Ngqura. A large section of the coastline has already been disturbed and a significant portion of coastal public property has been lost. Should the proposed development not go ahead, alternative options may be used for abstraction of seawater and discharge of effluent, which may require additional disturbance of the coastal zone and, potentially, the loss of additional coastal public property.	**MODERATE –**	Slight	Study Area	Permanent	Definite	Not Applicable	Not Applicable	**MODERATE –**

7. PLAN OF STUDY FOR EIA

Item 2 (i) of Appendix 2 of the National Environmental Management Act (NEMA, Act No. 107 of 1998, as amended) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent amendments), states that a *"plan of study for undertaking the environmental impact assessment process"* must be included in the Scoping Report.

This Chapter sets out the Plan of Study (PoS) for the EIA phase of the assessment. The Competent Authority will provide relevant comment with respect to the adequacy of this Plan of Study for the EIA, as it informs the content of the EIR and Specialist Reports.

7.1 ALTERNATIVES

Section 2.6 of this Scoping Report details the process of determining the preferred alternative for the current EA application.

It is important to note that the EIA phase will assess the preferred alternative which includes both:

- Fundamental alternatives (activity and location); and
- Incremental alternatives (ALL preferred designs and technologies).

The following overall preferred alternative has been identified for the marine intake and discharge servitudes:

Alternative category	**Preferred alternative intake servitudes**	
Servitude	**Intake servitude 1**	**Intake servitude 2**
Activity	• Abstraction of seawater water from the sea for Once-Through and Wet Mechanical Cooling of power stations.	• Abstraction of seawater from the sea for land-based aquaculture and desalination.
Broad geographical location	• Cooling water intake servitude inside the Port located at the root of the eastern breakwater as indicated in Figure 2.18.	• Combined aquaculture and desalination water intake servitude located east of the Port as indicated in Figure 2.18.
Specific location	• Servitude radius of 100 m and a depth of –6 m CD.	• Servitude width of 200 m, 500 m offshore and at a depth of –10 m CD.
Design and Technology	• Once-Through Cooling water intake basin with four concrete channels each 3.5 m wide. • Wet Mechanical Cooling water intake jetty with a 710 mm HDPE pipe.	• Desalination – up to three 1,000 mm diameter HDPE intake pipes; • Aquaculture – up to three 1,600 mm diameter pipeline tunnels; • Vertical beach wells; • WEROP wave pumps; and • Stormwater gabions.

Alternative category	Preferred alternative discharge servitudes		
Servitude	**Discharge servitude 1**	**Discharge servitude 2**	**Discharge servitude 3**
Activity	Discharge of Once-Through and Wet Mechanical cooling water effluent totalling 15.0 m^3/sec, back into the sea.	Discharge of finfish aquaculture recirculation system effluent (0.94 m^3/sec), brine (1.22 m^3/sec), treated wastewater (1.4 m^3/sec) in three separate pipelines, and stormwater, into the sea.	Discharge of abalone aquaculture flow-through effluent (5.0 m^3/sec) and stormwater, into the sea.
Geographical location	East of the Port of Ngqura as indicated in Figure 2.18.	East of the Port of Ngqura as indicated in Figure 2.18.	East of the Port of Ngqura as indicated in Figure 2.18.
Specific location	Servitude of 200 m width to – 11 m CD, 650 m offshore	Servitude of 200 m width with: • Brine discharge to -13.5 m CD, 1,000 m offshore. • Finfish aquaculture discharge to -16 m CD, 1,500 m offshore. • Wastewater from phase 2 of the WWTW to – 20 m CD, 3,000 m offshore.	Servitude of 200 m width along the shoreline.
Design and layout	Tunnel with diameter of up to 3,000 mm.	Pipelines including: • Brine – 700 mm diameter HDPE pipe; • Finfish - 700 mm diameter HDPE pipe; • Wastewater – up to 700 mm diameter HDPE pipe. Stormwater gabion system.	Beach pipeline – 1,600 mm diameter HDPE pipe. Stormwater gabion system.

The following overall preferred alternative has been identified for the land-based intake and discharge pipeline servitude:

Alternative category	Land-based servitudes
Activity	Land-based infrastructure is required to connect the various servitude(s) to the respective industries.
Geographical location	Coastal area of Zone 10
Specific Location	30 m Servitude (Figure 2.21).
Design and layout	HDPE pipes with diameters ranging between 600 mm to 3,000 mm

Operational aspects would be restricted to maintenance of discharge and intake infrastructure and environmental monitoring. As such no design/layout, technology and/or operational alternatives will be assessed for the proposed development as all options mentioned in the project description will require authorisation.

7.1.1 No Development Alternative

The 'no-development' option assumes that the site remains in its current state, i.e. a Special Economic Zone (SEZ) consisting of various industries, conservation areas and coastal areas. The proposed site falls within the Addo Elephant National Park Marine Protected Area.

The no-go option would thus mean that the land within the Coega SEZ allocated for the marine infrastructure servitude will remain vacant and predominantly undisturbed, however, further encroachment of alien and invasive species would thus be expected within the terrestrial environment. Should the no-go option become the preferred option, it may have several negative impacts including the loss of potential employment associated with the project, loss of industrial investment due to the lack of sea water intake options and potential environmental impacts associated with industries opting to discharge of effluent via various other means.

	TYPES	LOCATIONS
Gaps	There are no material gaps in information, other than the information to be provided in the specialist studies that are currently underway.	The preferred alternative has been determined based on input from a desktop assessment of the proposed site, previous specialist assessments undertaken for the proposed development, previous input from stakeholders as well as input from PRDW on the preliminary results of the revised marine dispersion modelling. Please note that all specialist studies are currently underway and have not been completed to date. As such the following gaps have been identified: <u>Economic Assessment:</u> A detailed costing between the eastern and western side of the Port of Ngqura has not yet been completed, although the western option will most certainly be significantly more costly provisionally projected to be in the order of over R5 billion over the 20 year life of the project. <u>Ecological Assessment:</u> Although the field work for the ecological assessment has been conducted, the draft report is not yet available and as such there may be additional sensitive sites that might need to be avoided when placing terrestrial infrastructure. <u>Marine Heritage Assessment:</u> The fieldwork for the marine heritage assessment has been conducted. No shipwrecks were found in the vicinity.

Uncertainties	There are currently no inherent uncertainties associated with the proposed project	There are currently no inherent uncertainties associated with the proposed project
Assumptions	Assumes that all the land-based activities requiring seawater will take place and that the correct maximum volumes are projected. Assumes that there is a need for the energy that will be generated by the gas hub and power plants to be constructed within the SEZ. Assumes that there are no other energy generation technologies that could meet the energy requirements and that have lower cooling water requirements.	The preferred layout assumes that the capital and operating costs associated with the location of infrastructure west of the Port would render the project financially unfeasible. The additional costs associated with transporting cooling water to the west of the Port is provisionally projected to be in the order of over R5 billion over the 20 year life of the project. The preferred layout assumes the layout of the servitudes is the optimal layout in terms of the preliminary dispersion modelling results which shows adequate dilution of effluent within the marine environment (i.e. it meets the required water quality guidelines).

7.2 IMPACTS

The following environmental aspects will be assessed as part of the EIA process, although additional impacts might be raised by the I&APs, the EAP and/or the specialist consultants, and these will also be assessed. Thus, the list presented below should be regarded as preliminary at this stage.

Table 7.1 Impacts to be investigated in the EIA phase

IMPACT	ALTERNATIVE	CAUSE AND COMMENT
IMPACTS ON THE PHYSICAL ENVIRONMENT		
TERRESTRIAL IMPACTS		
Impacts on topography and bathymetry *(design, construction and decommissioning phase)*	Preferred alternative	It is envisaged that changes to the terrestrial topography of certain localities within the study area will be required during the construction of the land-based activities associated with the proposed project, especially along areas of the coastline where intake and outfall infrastructure will be constructed. In addition, there are likely to be minor changes to the bathymetry of the intertidal and subtidal areas following the proposed infrastructure to be constructed on the seabed.
	No-Go	The topography and bathymetry within the terrestrial portion of the proposed project area have been impacted on by numerous developments within the Coega SEZ, especially the Port of Ngqura as well as the Sunshine Coast quarry located in Zone 10.
Impacts on land	Preferred alternative	The land-based activities associated with the proposed project will fall within an existing industrial zone (the Coega SEZ) and

IMPACT	ALTERNATIVE	CAUSE AND COMMENT
use *(construction, operational and decommissioning phase)*		thus is in line with the proposed land use of the area. Zone 10 of the Coega SEZ is earmarked for aquaculture and, because the proposed development is essential to the functionality of the aquaculture development zone (ADZ), the development and operation of the proposed marine infrastructure servitude will be beneficial to the land use of the area.
	No-Go	The no-go option will result in land allocated for aquaculture not being utilised for this purpose as a result of insufficient (or lack of) intake water.
Soil Contamination and Erosion *(design, construction, operation and decommissioning phase)*	Preferred alternative	The construction of the land-based infrastructure associated with the proposed servitude will require the clearing of vegetation which will result in exposed soil surfaces and thus the potential for soil erosion. In addition, the utilisation of construction vehicles and other construction machinery during the construction phase could result in soil contamination within the area. During the operational phase, any leaks derived from the infrastructure associated with the discharge of effluent could result in soil contamination within the study area.
	No-Go	Due to the nature of the Coega SEZ (an industrial development area), there are a number of areas that have previously been eroded and/or contaminated during construction of various infrastructure.
Impacts on Surface and Groundwater Resources *(design, construction, operational and decommissioning phase)*	Preferred alternative	Various substances may result in the pollution of surface and groundwater resources. Construction activities may lead to sediment being deposited into drainage lines, wetlands and other water bodies, including the potential for seepage into groundwater resources. Pollution from litter and general construction waste may occur due to improper site management. Washing of vehicles and equipment may result in the pollution of drainage lines, and other water bodies, and pollution may occur being a consequence of poor vehicle maintenance and improper storage of hazardous materials such as fuel, etc. Operational activities could result in the pollution of surface and groundwater resources following the discharge of treated effluent, leakages from discharge infrastructure and hazardous chemical spill during maintenance activities.
	No-Go	Due to the nature of the Coega SEZ (an industrial development area), surface and groundwater pollution has potentially occurred as a result of other existing industrial activities within the area.
MARINE IMPACTS		
Impact on Seawater Quality *(construction, operational and decommissioning phase)*	Preferred alternative	Construction of the proposed marine infrastructure, which will likely include blasting, which will result in sediment plumes leading to increased turbidity of the seawater and potentially smothering marine biota. During the operation of the project, the discharge of treated effluent into the marine environment could reduce the quality of the seawater and could impact on sensitive habitats associated with marine biota. This is especially pertinent with regards to the proximity of the Addo Elephant National Park MPA. Potential pollutants include nutrients (e.g. ammonia, nitrates and nitrates), which may be derived from the effluent from the WWTW and ADZ and brine from desalination facilities. In addition, the discharge of effluent from the G2P projects could result in increased seawater temperatures, which will in turn have impacts on the available

IMPACT	ALTERNATIVE	CAUSE AND COMMENT
		oxygen and the several indirect impacts on the biota that rely on specific seawater quality parameters.
	No-Go	There is currently discharge of treated and untreated effluent occurring at several locations along the Algoa Bay coastline. Should the proposed marine infrastructure servitude not be developed, the various industries within the Coega SEZ could apply for separate discharge pipelines, which is likely to result in numerous cumulative seawater impacts.
Change in Marine Sediment Dynamics and Wave Action *(design, construction, operational and decommissioning phase)*	Preferred alternative	The design and placement of solid structures within a dynamic coastal environment is likely to result in changes to the sediment dynamics and localised currents in the study area. In addition, the construction of infrastructure in the surf zone could result in changes to the wave action along the shoreline. Changes to the sediment dynamics and wave action of the coastal zone could result in increased erosion or deposition along this section of the coastline and could also have several impacts on the marine biota that rely on specific sediment characteristics.
	No-Go	This section of Algoa Bay has been significantly altered by the development of the Port of Ngqura. The existence of the Port's breakwaters as well as the marine traffic in the surrounding area currently has a significant influence on the marine sediment dynamics. Should the development not go ahead, alternative options may be used for abstraction of seawater and discharge of effluent, resulting is additional changes to the sediment dynamics in the area.
Disturbance of the Coastal Zone and Loss of Coastal Public Property *(design, construction, operational and decommissioning phase)*	Preferred alternative	The design of the proposed seawater intake and discharge infrastructure could impact on physical coastal habitats for biota such as bird habitats\. Construction of the proposed seawater intake and discharge infrastructure will require movement of construction vehicles and machinery within the coastal zone. Once operational, the servitude(s) will extend across a portion of coastal public property (CPP), and will therefore need to be protected from public access, thus reducing the beach amenity and CPP access in the area.
	No-Go	This section of Algoa Bay has been significantly altered by the development of the Port of Ngqura. A large section of the coastline has already been disturbed and a significant portion of coastal public property has been lost. Should the proposed development not go ahead, alternative options may be used for abstraction of seawater and discharge of effluent, which may require additional disturbance of the coastal zone and, potentially, the loss of additional coastal public property.
IMPACTS ON THE BIOLOGICAL ENVIRONMENT		
TERRESTRIAL IMPACTS		
Disruption to Terrestrial Ecosystems (design, construction and decommissioning phase)	Preferred alternative	The design of the proposed marine servitude infrastructure could impact on coastal biota such as bird populations. During the construction phase there will be impact on the natural vegetation including clearing of, or damage to, indigenous coastal vegetation, the removal of intact communities, loss of species of special concern and/or trees protected in terms of the National Forest Act. In addition, the proposed development may result in the introduction of alien species.

IMPACT	ALTERNATIVE	CAUSE AND COMMENT
	No-Go	Currently there is invasive alien vegetation within the proposed development area. Under the no-go option, it is likely that further spread and infestation will occur if the status quo remains unchanged.
MARINE IMPACTS		
Disruption to Intertidal or Sub-Tidal Biota (design, construction, operational and decommissioning phase)	Preferred alternative	The design and construction of the marine infrastructure servitudes could result in the disturbance of intertidal and subtidal areas, resulting in mortalities to marine fauna and flora located within the area. The subtidal reefs offshore of the proposed project area contain habitats of a number of important fish and shellfish species. Noise resulting from the drilling and blasting activities associated with construction will disturb marine fauna and could affect the navigation, communication and sensory systems of some species. During operation, it is possible that several smaller marine species could be entrained in the abstraction infrastructure during the abstraction of seawater.
	No-Go	Previous developments within the Coega SEZ have likely resulted in disruption to the marine biota and the continued operation of the Port of Ngqura implies that marine fauna and flora within (and in close proximity to) the port are constantly disturbed. Should the proposed development not go ahead, alternative options may be used for abstraction of seawater and discharge of effluent, which may result in further disturbance of marine biota.
GENERAL IMPACTS AND IMPACTS ON THE SOCIO-ECONOMIC ENVIRONMENT		
Waste Management *(construction, operational and decommissioning phase)*	Preferred alternative	Solid waste associated with construction activities such as building rubble (e.g. excavated material, brick off-cuts, packaging, waste concrete, etc). Littering on site may result in non-biodegradable material entering the marine environment. Plastic bags, bottles, rope and other litter could have a direct impact on marine fauna resulting in the death of marine life. Solid waste from the operational phase could be derived from maintenance activities and could include dead organic material from the intake infrastructure and inlet screens. Liquid waste will be discharged into the marine environment via the discharge infrastructure and incorrect treatment of the waste could have impact on seawater quality.
	No-Go	The CDC has a waste management plan in place, as such there is currently no evidence of littering on site.
Health and Safety (construction, operational and decommissioning	Preferred alternative	Health and safety aspects will mostly pertain to activities defined under the Occupational Health and Safety Act (Act No. 85 of 1993). Work occurring throughout the proposed development will consist of health and safety risks.

IMPACT	ALTERNATIVE	CAUSE AND COMMENT
phase)	No-Go	Within an industrial area there is potential for accidents and health impacts.
Impacts on Archaeological, Palaeontological and/or Cultural Sites *(construction phase)*	Preferred alternative	It is possible that sites of archaeological, palaeontological and/or cultural significance are present on or near the proposed development site. This includes marine archaeological sites such as shipwrecks. If these sites are not correctly identified and/or protected prior to construction, this may result in the loss of sites of cultural importance. The correct identification and recovery of sites of archaeological, palaeontological and/or cultural importance could potentially provide a better understanding of the heritage and/or geological history of the area. It is important to note that an Archaeological, Palaeontological and Cultural Heritage Assessment was conducted for the SEZ in 2010. The CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. The CDC's Environmental Specifications for Construction include detailed requirements for the management of heritage in the SEZ, amongst others, the appointment of an archaeologist and palaeontologist during the construction phase of a project.
	No-Go	If any archaeological and cultural heritage sites are present, these would not be disturbed but would also not be uncovered and therefore not make any contribution to the understanding of the archaeological or cultural heritage of the area.
Social benefits from the project *(construction, operational and decommissioning phase)*	Preferred alternative	The proposed development will create a number of temporary employment opportunities during the construction phase as well as several permanent employment opportunities during operation for the maintenance of infrastructure.
	No-Go	Should the project not proceed, no further employment opportunities and tax revenue will be realised.
Provision of seawater for industrial developments *(operational phase)*	Preferred alternative	The proposed development will result in the abstraction of seawater, which is required for the proposed ADZ, the Gas to Power (G2P) projects and the desalination plant, as well as several other future developments in the Coega SEZ. This will reduce the consumption of municipal water for existing industries and provide some relief to the water scarce area.
	No-Go	The current water scarcity in the region will continue placing pressure on the municipality and is likely to give rise to limited attractiveness of the Coega SEZ to investments. The development of the approved ADZ will not be possible should the seawater abstraction not materialise.
Provision of discharge infrastructure for industrial	Preferred alternative	The rationale for developing an integrated marine discharge servitude is to have a common user servitude in which a number of possible industries can establish infrastructure required to discharge effluent into the marine environment. The management of the volumes and quality of effluent would be far easier than

IMPACT	ALTERNATIVE	CAUSE AND COMMENT
developments *(operational phase)*		having several different effluent discharge developments and would streamline the maintenance of infrastructure. The position and depth of the discharge, as well as the release of effluent to the marine environment rather than rivers or estuaries, has potentially less environmental impact due to the increased assimilative and dispersive capacity of the coastal waters.
	No-Go	The no-go option could result in two possible scenarios namely (1) the establishment of a number of separate different discharge pipelines and infrastructure or (2) a lack of investment in the Coega SEZ as a result of the costs associated with having to establish separate outfall options.
CROSS CUTTING IMPACTS		
Noise Impacts *(construction and decommissioning phase)*	Preferred alternative	It is anticipated that there will be an increase in the noise levels during the construction phase of the proposed development. Increased noise levels for activities occurring within the marine environment have the potential to significantly impact on marine life.
	No-Go	As the proposed development site is within an industrial zone, there is existing increased noise levels within the project boundaries.
Traffic *(construction and decommissioning phase)*	Preferred alternative	During the construction phase, large construction vehicles will be utilising the existing road network and may establish new accesses to get to the proposed development site. This may result in the impeding of traffic flow and damage to the existing roads. In addition, the construction within the marine environment may require the transportation of materials in and out of the Port of Ngqura.
	No-Go	The proposed site is within an existing SEZ and thus there are a number of large vehicles that utilise the surrounding road network. In addition, the Port of Ngqura is currently recognised as one of the busiest ports in South Africa.
Air Quality *(construction and decommissioning phase)*	Preferred alternative	Impacts on air quality during the construction phase will primarily result from increased dust levels associated with the required excavation, vegetation clearing, grading and other construction activities.
	No-Go	As the Coega SEZ is an established industrial area, there are regular developments taking place that could potentially result in increased dust levels as a result of vegetation clearance activities. In addition, there are a number of industries within the Coega SEZ that operate under an Air Emissions Licence and therefore are permitted to emit certain pollutants into the atmosphere.
Visual Impact *(construction, operational and decommissioning phase)*	Preferred alternative	Construction vehicles and equipment will be evident in the existing landscape during the construction phase. Generation of dust will increase the visibility of the project and may become an eyesore if not managed correctly. The proposed development may have a visual impact on the coastal area that is currently undeveloped. However, in relation

IMPACT	ALTERNATIVE	CAUSE AND COMMENT
		to the nature of the surrounding industrial zone, it will not be a significant visual transformation to the general landscape of the Coega SEZ.
	No-Go	The existing Port and other Coega SEZ infrastructure has resulted in significant changes to the visual landscape of the area.
Climate Change *(construction, operation and decommissioning phase)*	Preferred alternative	Influence of unpredictable / erratic physical conditions and plume dilution and dispersion as well as the placement and integrity of physical structures and/or infrastructure in the dynamic coastal environment.
	No-Go	N/A
Alignment with planning instruments *(construction, operation and decommissioning phase)*	Preferred alternative	The proposed project is in line with the NMBM SDF, IDP and the Coega SEZ development plans.
	No-Go	The Coega SEZ would still continue being developed in line with all planning documents
Social benefits from the project *(construction, operational and decommissioning phase)*	Preferred alternative	The functionality of the proposed marine abstraction and discharge servitude will also enable the development of a number of other industries (e.g. G2P, WWTW and the ADZ), which will in the short-term result in a number of construction jobs and employment opportunities during operations.
	No-Go	This may also result in a number of investments (e.g. aquaculture companies) not taking off, thus resulting in the loss of several additional potential employment opportunities.
Increased pressure on the marine environment of Algoa Bay as a result of discharge effluent and additional hard structures in the dynamic coastal zone *(construction, operational and decommissioning phase)*	Preferred alternative	The design of the proposed marine servitude infrastructure could impact on physical coastal habitats as well as the water quality of water abstracted via the Cerebos intakes.
	No-Go	This section of Algoa Bay has been significantly altered by the development of the Port of Ngqura. A large section of the coastline has already been disturbed and a significant portion of coastal public property has been lost. Should the proposed development not go ahead, alternative options may be used for abstraction of seawater and discharge of effluent, which may require additional disturbance of the coastal zone and, potentially, the loss of additional coastal public property.

7.3 SPECIALIST STUDIES

The following Specialist Studies are proposed for the EIA Phase of the assessment:

(i) Marine and Underwater Cultural and Archaeological Impact Assessment;
(j) Environmental Economic Impact Assessment;

(k) Review of existing Baseline Marine Ecology Report;
(l) Geotechnical Assessment
(m) Ecological Impact Assessment;
(n) Marine Dispersion Modelling;
(o) Aquatic Impact Assessment – Existing study findings to be incorporated into the EIA; and
(p) Heritage Impact Assessment – Existing study findings to be incorporated into the EIA and EMPrs.

The Terms of Reference for the above-mentioned studies, which outline the information required from the specialists, are provided below and the methodology for assessing the significance of impacts, is described in the section that follows. The assessment of impacts will focus on the preferred alternative, **including ALL preferred design and technology alternatives**. Specialists will also be required to address issues raised by the I&APs in their reports.

7.3.1 Marine and Underwater Cultural and Archaeological Impact Assessment

Algoa Bay is one of the bigger shipwreck traps in South Africa. These shipwrecks represent several nationalities and several historical events, from exploration to trade, military engagements, immigration and industry. There are hundreds of wrecks in the Bay, of which the precise location of most is unknown. The methodology for the proposed Marine and Underwater Cultural and Archaeological Impact Assessment is as follows:

- Desktop survey of potential underwater heritage sites, especially shipwrecks in the area through study of available and historical records. Databases include published as well as unpublished sources of information. In Algoa Bay, the potential for sensitive shipwrecks is very high and it's important to do an in-depth UHIA;
- Magnetometer survey and analysis of the affected area;
- Full analysis and report on the findings of the fieldwork with probability and significance ratings;
- Field survey on the shore zones, specifically the Underwater Heritage Survey:
- A desktop Heritage Impact Assessment of the maritime cultural heritage is the first step in ascertaining the probability of finding maritime and underwater cultural heritage sites in a proposed development area;
- A complete magnetometer survey needs to be conducted and fully analysed. The magnetometer would be conducted using 15 meter run lines over the proposed area;
- The magnetic anomalies would be noted and mapped; and
- Underwater heritage sites would be mapped on a GIS platform.

7.3.2 Environmental Economic Impact Assessment

The following describes the CES approach to conducting the Environmental Economic Impact Assessment (EEIA) of the proposed marine pipeline servitudes in the Coega SEZ. The EEIA may need to consider inputs from various stakeholders other than the CDC.

Defining EEIA boundaries
When compiling the EEIA, clear boundaries need to be established relating to the geographical and operational extent or scope extent of the assessment.

Materiality
Material is a VERY IMPORTANT ASPECT of the EEIA, as one does not want to focus effort on unimportant and minor issues and impacts. A level of financial materiality will therefore need to be decided upon by the Project Team and the CDC prior to conducting detailed costing exercises.

The determination of materiality may be influenced by the following two main dimensions:

- The significance of the environmental and social impacts of the marine pipeline; and

- Their substantive influence on the assessments and decisions of stakeholders.

There will need to be a very clear explanation of how the Materiality principle were applied to identify material environmental issues, including any assumptions made.

Distinguishing and weighting of different types of costs
The following types of sustainability costs may need to be distinguished and weighted differently in the EEIA:

- Positive and negative;
- Direct and indirect;
- External and internal costs;
- Actual or potential;
- Short-term or long-term; and
- Intended or unintended.

CES will identify all habitats and activities that might impose environmental impacts resulting from the proposed construction activities, including:

- Marine;
- Terrestrial; and
- Fresh water.

Important biodiversity and species information will be available from SANBI and the Eastern Cape Biodiversity Conservation Plan. DEA Oceans and Coasts also has information of sensitive coastal environments. Other EIA information will also provide useful information on the extent of expected impacts.

CES will attach economic values to the potential impacts on biodiversity. Although environmental impacts are difficult to quantify, will determine appropriate valuation methods for various environmental and social aspects, such as:

- Cost to remediate or replace;
- Cost of setting up a biodiversity offset project;
- Costs of natural resource goods and services (e.g. value of harvested fish or shellfish); and
- Willingness to pay.

In some instances, it may be impossible or very challenging to attach a financial value to an environmental or social cost or benefit. In such instances, qualitative information may be necessary, or even a range of financial estimates provided. Valuation in many instances will be based on an estimated RANGE of valuations usually reflecting orders of magnitude (i.e. the range could be R1 million to R10 million).

Where impacts are impossible to value, qualitative information can be provided. The timing of risks could be relevant:

- Short-term – 1 to 10 years (i.e. immediate loss of biodiversity due to construction footprint);
- Medium-term – 10 to 50 years (i.e. accumulation of heavy metals in marine sediments); and
- Long-term – 50 to 100 years (e.g. climate change induced sea level rise).

Vulnerability relates to the ability to respond to identified risks. CES will assess the current and future needs in terms of preparing to reduce or mitigate vulnerability to future risks.

In addition to conducting on the ground site assessments of the proposed project area, CES will source and evaluate as much existing information as possible, including:

- Eastern Cape Biodiversity Conservation Plan;
- Nelson Mandela Bay Metro Environmental Management Plan and Coastal Management Plan;
- CDC EIAs, EMP and EMS; and
- Stakeholder Engagements (e.g. SANParks).

CES will derive an EEIA matrix of all possible environmental impacts and risks and will assess in terms of probable materiality on how much effort to expend in further attaching a financial value to a particular cost.

Sample EEIA Matrix
The following is a simple example of what an EEIA matrix will look like:

Type of cost/benefit	Nature of cost	Valuation of cost	Nature of benefit	Valuation of benefit
ENVIRONMENTAL				
Direct	Loss of aquatic and terrestrial biodiversity due to expansion footprint	• Cost of offset • Natural resource value (i.e. environmental goods and services)		
Indirect	Invasive terrestrial and marine organisms	Cost to eliminate aliens	Benefit of formal proclamation of environmental offset	Environmental goods and services provided by offset
	Air pollution from tenant activities	Cost to monitor and reduce emissions	Renewable energy projects	Value of project and revenue
	Water pollution from tenant activities	Cost to monitor clean up water or processes		
External	Exposure to climate change impacts	Cost per ton of carbon		

7.3.3 Review of existing Baseline Marine Ecology Report

The existing Baseline Marine Ecology Report will be updated with additional dispersion modelling results. These results are likely to result in a refinement of the impacts associated with outfall / discharges.

7.3.4 Geotechnical Investigations

Geotechnical Investigations will be undertaken to determine the suitability of the site for the construction of land-based infrastructure.

The methodology for undertaking the Geotechnical Investigations is as follows:

- Excavate the requisite number of Test Pits using a tractor-loader backhoe (TLB) excavator to a planned depth of about 3.0 m below surface of shallower refusal;
- Profile the Test Pit according to the Guidelines for Soil and Rock Logging in Southern Africa (2009);
- Conduct Dynamic Cone Penetrometer (DCP) tests adjacent to each Test Pit to a planned depth of about 2.0 m below surface or shallower refusal; and
- Some disturbed soil samples will be collected from representative soil horizons and submitted to a SANAS-accredited soil testing laboratory to carry out specified tests.

7.3.5 Ecological Impact Assessment

Construction of the marine pipeline servitudes and associated infrastructure requires the removal of extensive vegetation and habitat. It is important to assess the level of impact on biodiversity, especially the floristic and threatened vegetation types. It is necessary to determine the baseline condition of the area to assess the resultant impact on the flora and fauna. The terms of reference for the biodiversity and faunal assessment will be:

- Undertake a desktop assessment of the biodiversity and conservation value of the study area in terms of the relevant biodiversity plans;
- Assess the conservation value of the various ecological habitats in the area, in order to assess the significance of potential habitat loss on faunal groups as a result of the development;
- Identify the main animal communities associated with the plant communities (amphibian, mammals, birds, and reptiles);
- Identify any rare or endangered faunal and floral species;
- Assess the extent of alien flora and faunal species over the site, and associated risks of alien invasion as a result of the project;
- Describe the impacts of current land-use, so that the potential impacts from the development on the natural environment can be understood in this context;
- Place the project area within the biodiversity context of the region;
- Provide a sensitivity map of the concession area in order for the proponent to better determine the best position / layout of the proposed infrastructure;
- To address all ecological issues and concerns raised by the I&APs during the scoping phase;
- Determine the impact of the construction and operation of the proposed development on the biodiversity in the area;
- The significance of the potential impacts and benefits will be assessed using the CES methodology. Any predictions will need to include the confidence in the impacts occurring, and the significance of these impacts occurring on the local flora and fauna;
- Provide recommendations and mitigation measures that will reduce negative impacts on the local ecology and optimize conservation benefits.
- Provide recommendations for the relocation of floral species of special concern.

7.3.6 Marine Dispersion Modelling

The terms of reference for the Marine Dispersion Modelling are as follows:

- Assess the dispersion of effluent discharged from the Coega SEZ in terms of changes in key water quality parameters (e.g. temperature, salinity, suspended solids and a conservative tracer) using an appropriate wave refraction and hydrodynamic model (SWAN, Delft3D-WAVE and FLOW, MIKE21);
- Determine levels of these water quality parameters at the edge of the mixing zone and proposed water intake localities. The model will investigate/assess dispersion plume movement and water quality at the edge of the mixing zone. That will be overlaid on suggested abstraction points to determine if the discharges will potentially have an impact on the quality of abstraction water, such as for proposed land-based aquaculture activities. The results will inform the final position of the seawater abstraction points within the abstraction servitude(s);
- Advise on the position of sea water intake localities for anticipated uses;
- Advise on the position of the discharge servitude(s). Input should be provided to Design Engineers on the type and depth of discharge required to achieve desired dilution and dispersion;
- The near-field parameters (e.g. types of effluent, changes in water temperature and

salinity as well as initial dilutions) would be determined in consultation with the appointed Marine Ecologist working with the modelling team. The results will enable the Marine Ecologist to assess the impacts of the discharges on the various ecosystems based on the predicted achievable dispersions, as well as to provide information on the best location for the intakes (outfalls) and depth of intake (discharge);

- The appointed Marine Ecologist would interpret the model results, advise on required model outputs and assess the impacts of the discharges on the various ecosystems based on the predicted achievable dispersions, as well as provide information on the best location for the intakes (outfalls) and depth of intake (discharge);
- The Hydrodynamic Model would be used to determine the near-shore wave conditions and wave energy dissipation. The Hydrodynamic Model will thus be three-dimensional and include the effects of waves, wind, tides, temperature stratification, salinity and heat fluxes;
- Provision has been made for simulating an additional 3 scenarios, in addition to the 12 scenarios previously modelled, determined by a specific location (horizontal and vertical position), a specific discharge rate, and associated discharge parameters. The environmental conditions for a scenario will include a winter, summer and a calm period. Scenarios will be determined and concluded in discussion with the appointed Project Team in a workshop that would be arranged;
- The study will assess the extent to which the water quality at the proposed aquaculture intake(s) would be impaired by the proximity of the proposed discharges and associated effluent plumes;
- The modelling would address the worst case scenario and characterise the extent and duration for which there might be non-compliance with the required dilutions governed by applicable water quality guidelines and / or the water quality requirements of other users in the region;
- The effluent dispersion modelling study would quantitatively inform the associated marine ecological assessment;
- The specialist report will include:
    - An update of the previous marine dispersion modelling carried out in 2017, where relevant;
    - Identification and brief summary of any applicable legislation and/or license/permit applications that may be required or that are relevant to the specialist study being undertaken;
    - An assessment of the compliance of the effluent discharges with receiving water quality guidelines, the extent and duration of the exceedance of these guidelines and any potential effects of the effluent discharges on water quality at the proposed aquaculture / seawater cooling intakes and other beneficial users (current and known/likely future);
    - Recommendations on mitigation measures required to minimise identified impacts; and
    - Inputs into the Environmental Management Plan (EMPr's) for the proposed construction and operation of the marine intake and discharge structures.
- PRDW's marine modeler and marine ecologist will be required to attend a workshop with relevant stakeholders once the modelling results are available to discuss recommended placement of servitude(s) and likely impact on beneficial users (e.g. Port, SANParks, fisheries, etc.)
- PRDW will be required to conduct ongoing liaison with the appointed Environmental Assessment Practitioners for the EIA and the appointed marine ecological specialist to ensure integration into the EIA report. Liaison would include virtual meetings, telecons and emails.

7.3.7 Aquatic Impact Assessment

In September 2016, the Coega Development Corporation (CDC) appointed Scherman Colloty & Associates (SC&A) to assess and delineated all wetlands located within the Coega SEZ. This study identified three wetlands within Zone 10 of the SEZ, none of which are situated within 500 m of the proposed development (refer to Figure included below), except the Coega River/Estuary (port). As per the NFEPA (2011) spatial data set (please see Figure 4.3 under Section 4.2.2: Surface Hydrology), the artificial wetland located along the coast, in the centre of the proposed development, is Coega Marine Growers and as such not a natural wetland in the true sense. Therefore, since the development will not take place within a wetland and/or surface water feature or within 500 m of a wetland and/or surface water feature no additional aquatic impact assessment will be undertaken for the proposed development.

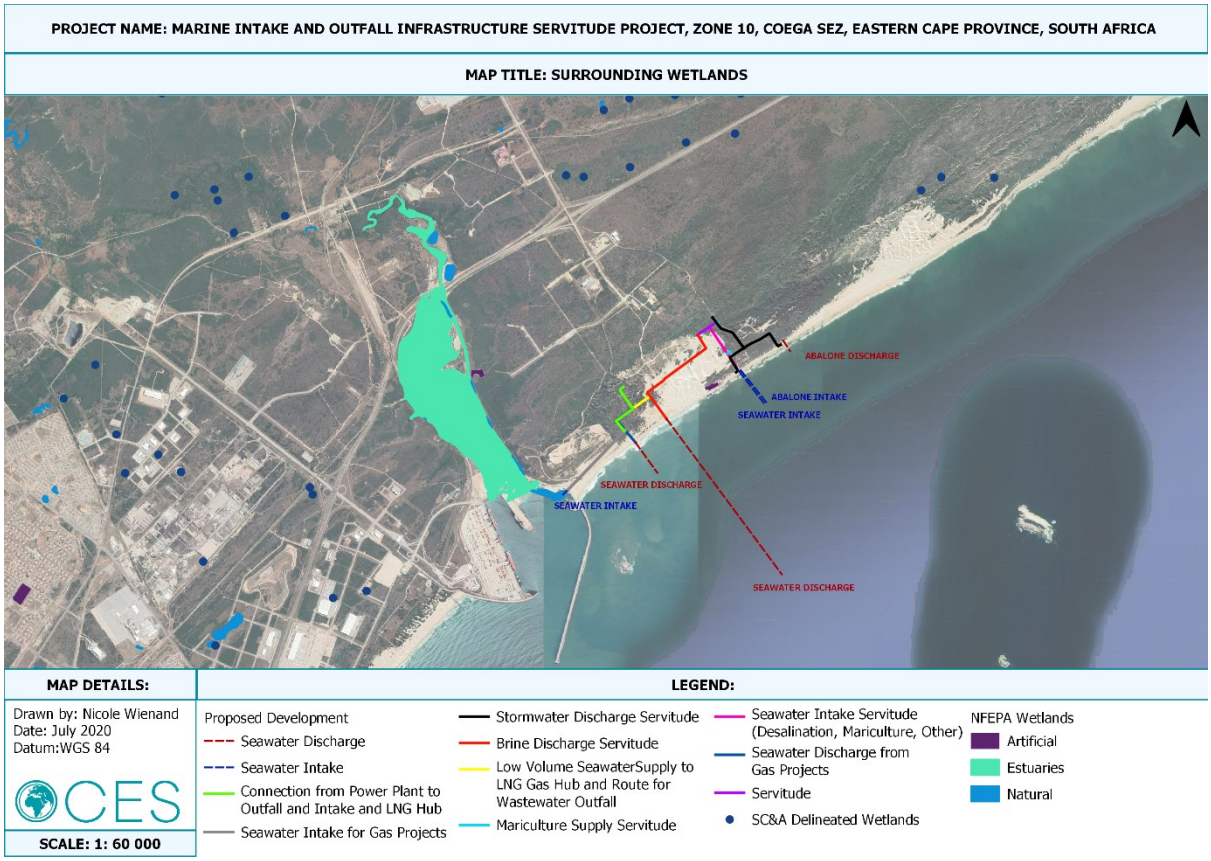

Figure 7.1: Infrastructure overlain on the identified wetlands within the SEZ.

7.3.8 Terrestrial heritage, archaeological and paleontological assessment

An Archaeological, Palaeontological and Cultural Heritage Assessment was conducted for the SEZ in 2010. The CDC also has a Heritage Management Plan, and guidelines from SAHRA in place to ensure that all aspects of heritage are managed. The CDC's Environmental Specifications for Construction include detailed requirements for the management of heritage in the SEZ, amongst others, the appointment of an archaeologist and palaeontologist during the construction phase of a project. These recommendations are included in the impact assessment included below and will be included in the EIA. It should be noted that we are aware that generally specialist studies should not be older than 5 years, however, heritage, archaeological and paleontological artefacts are sessile and thus the position of these do not change over time, as such it is considered acceptable to utilise the existing study as the status quo would not have changed.

7.4 IMPACT ASSESSMENT METHODOLOGY FOR THE EIA PHASE

CES has developed an evaluation criteria of impacts in accordance with the requirements outlined in Appendix 2 of the EIA Regulations (2014, as amended). This methodology takes into consideration the following variables:

Nature
Negative or positive impact on the environment.

Type
Direct, indirect and/or cumulative effect of impact on the environment.

Significance prior to mitigation
Four factors need to be considered when assessing the significance of impacts, namely:

- Relationship of the impact to temporal scales - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
- Relationship of the impact to spatial scales - the spatial scale defines the physical extent of the impact.
- The severity of the impact - the severity/beneficial scale is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system or a particular affected party. The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word '*mitigation*' means not just '*compensation*', but includes concepts of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.
- The likelihood of the impact occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts could occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

Each criterion (Table 7.2) is ranked with scores to determine the overall significance of an activity. The criterion is then considered in two categories, viz. effect of the activity and the likelihood of the impact. The total scores recorded for the effect and likelihood are then read off the matrix presented in Table 7.3, to determine the overall significance of the impact (Table 7.4). The overall significance is either negative or positive.

The environmental significance scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

Prioritising

The evaluation of the impacts, as described above is used to prioritise which impacts require mitigation measures.

Negative impacts that are ranked as being of "VERY HIGH" and "HIGH" significance will be investigated further to determine how the impact can be minimised or what alternative activities

or mitigation measures can be implemented. These impacts may also assist the decision-makers i.e. numerous HIGH negative impacts may bring about a negative decision.

For impacts identified as having a negative impact of “MODERATE” significance, it is standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigations measures will then be proposed.

For impacts ranked as “LOW” significance, no investigations or alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

Table 7.2: Criterion used to rate the significance of an impact.

EFFECT	**TEMPORAL SCALE**		
	Short term	Less than 5 years	
	Medium term	Between 5 and 20 years	
	Long term	Between 20 and 40 years (a generation) and from a human perspective almost permanent.	
	Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there	
	SPATIAL SCALE		
	Localised	At localised scale and a few hectares in extent	
	Study area	The proposed site and its immediate environs	
	Regional	District and Provincial level	
	National	Country	
	International	Internationally	
	SEVERITY		**BENEFIT**
	Slight / Slightly Beneficial	Slight impacts on the affected system(s) or party (ies)	Slightly beneficial to the affected system(s) or party (ies)
	Moderate / Moderately Beneficial	Moderate impacts on the affected system(s) or party(ies)	An impact of real benefit to the affected system(s) or party (ies)
	Severe / Beneficial	Severe impacts on the affected system(s) or party (ies)	A substantial benefit to the affected system(s) or party (ies)
	Very Severe / Very Beneficial	Very severe change to the affected system(s) or party(ies)	A very substantial benefit to the affected system(s) or party (ies)
LIKELIHOOD	**LIKELIHOOD**		
	Unlikely	The likelihood of these impacts occurring is slight	
	May Occur	The likelihood of these impacts occurring is possible	
	Probable	The likelihood of these impacts occurring is probable	
	Definite	The likelihood is that this impact will definitely occur	

Table 7.3: Matrix used to determine the overall significance of the impact based on the effect and likelihood of occurrence.

		EFFECT	
		LOW	HIGH
LIKELIHOOD	Unlikely	LOW	
	May Occur	MODERATE	
	Probable		HIGH
	Definite		VERY HIGH

Table 7.4: Environmental Significance Scale.

SIGNIFICANCE RATE		DESCRIPTION
LOW –	LOW +	An acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in either positive or negative medium to short term effects on the social and/or natural environment.
MODERATE –	MODERATE +	An important impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in either a positive or negative medium to long-term effect on the social and/or natural environment.
HIGH –	HIGH +	A serious impact, if not mitigated, may prevent the implementation of the project (if it is a negative impact). These impacts would be considered by society as constituting a major and usually a long-term change to the (natural &/or social) environment and result in severe effects or beneficial effects.
VERY HIGH –	VERY HIGH +	A very serious impact which, if negative, may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are unmitigable and usually result in very severe effects, or very beneficial effects.

Significance post mitigation

Once mitigation measure are proposed, the following criteria are then used to determine the overall significance (i.e. post mitigation significance) of the impact.

- Reversibility: The degree to which an environment can be returned to its original/partially original state.
- Irreplaceable loss: The degree of loss which an impact may cause.
- Mitigation potential: The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. The four categories used are listed and explained in Table 7.5 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Table 7.5: Criteria considered post mitigation

REVERSIBILITY	
Reversible	The activity will lead to an impact that can be reversed provided appropriate mitigation measures are implemented.
Irreversible	The activity will lead to an impact that is permanent regardless of the implementation of mitigation measures.
IRREPLACEABLE LOSS	
Resource will not be lost	The resource will not be lost/destroyed provided mitigation measures are implemented.
Resource will be partly lost	The resource will be partially destroyed even though mitigation measures are implemented.
Resource will be lost	The resource will be lost despite the implementation of mitigation measures.
MITIGATION POTENTIAL	
Easily achievable	The impact can be easily, effectively and cost effectively mitigated/reversed.
Achievable	The impact can be effectively mitigated/reversed without much difficulty or cost.
Difficult	The impact could be mitigated/reversed but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs.
Very Difficult	The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly.

These criteria are applied using the logic represented in the flow chart below (Figure 7.1).

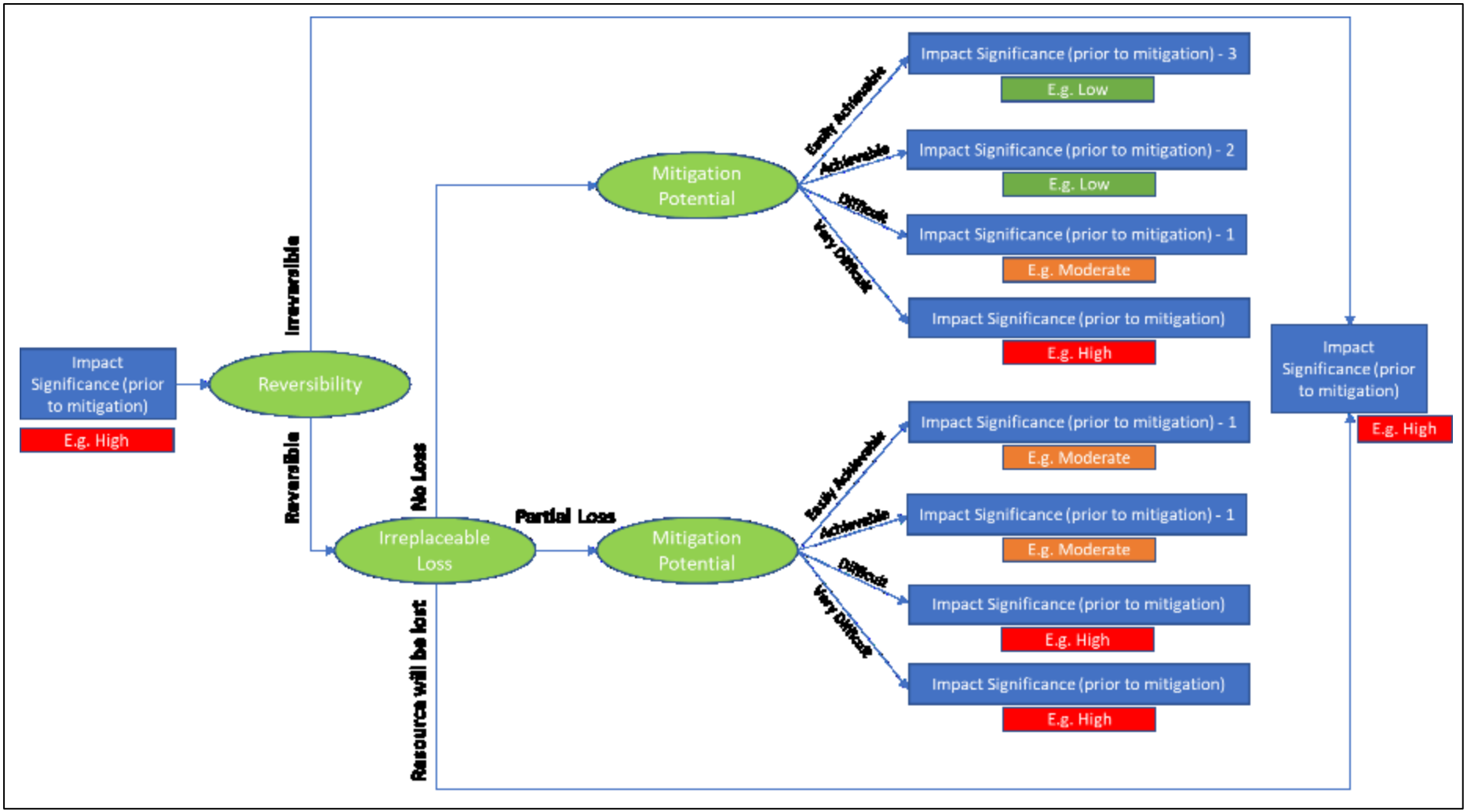

Figure 7.1: Logic used to rate overall significance post mitigation

7.5 THE PUBLIC PARTICIPATION PROCESS

The Public Participation Process will be divided into four phases which allows for initial (pre-application) stakeholder identification, as well as engagement during the Scoping Phase, the EIA Phase and the Environmental Authorisation Phase. The tasks which will be carried out at each phase are described in the table below:

Date	Phase	Meeting and/or deliverable	Objective
1 July 2020	Initiation	Placement of e-notice at CDC Business Centre	To comply with Section 41 of NEMA
06 November 2020		Distribute pre-assessment notifications as stipulated in the Sections outlined above	To comply with Section 41 of NEMA
13 November 2020	Scoping Phase	Distribute notifications of the availability of the Draft Scoping Report for public review as stipulated in the Sections outlined above	To comply with Section 40 of NEMA
15 December 2020		Compile Comments and Response Trail for incorporation into the Final Scoping Report	As per legal requirements all issues and/or comments raised by registered interested and affected parties needs to be documented in writing and responded to by the EAP
1 March 2021	EIA Phase	Distribute notifications of the availability of the Draft EIR for public review as stipulated in the Sections outlined above	To comply with Section 40 of NEMA
30 March 2021		Compile Comments and Response Trail for incorporation into the Final EIR	As per legal requirements all issues and/or comments raised by registered interested and affected parties needs to be documented in writing and responded to by the EAP

The primary aims for the public participation process include the following:

- Disclose activities planned by the project proponent and the EIA team;
- Identify concerns and grievances from interested and affected parties;
- Harness local expertise, needs and knowledge from the interested and affected parties.
- Respond to grievances, enquiries and suggestions from I&APs;
- Identify additional or new stakeholders and people affected by, or interested in, the proposed project;
- Gather perceptions and comments on the proposed terms of reference for the specialist studies;
- Ensure that all issues raised by I&APs have been adequately assessed;
- Share the findings of the EIR and specialist studies, such as significant impacts, mitigation measures, management actions, and monitoring programmes;
- Include any new concerns or comments that arise.

The **Public Participation Process has** commenced and will continue during the Scoping and EIA phase, during which I&APs are afforded further opportunities to raise their issues, concerns and comments regarding the proposed project. It is possible that some of the project details may have changed in response to the preliminary findings presented in the Final Scoping Report, and as a result of design changes made by the project proponent. I&APs and key stakeholders will be given an opportunity to review the Draft EIR before it is submitted to the authorities for consideration. Comments on the Draft EIR received from I&APs will be included and addressed in the Final EIR.

7.5.1 Identification of and Consultation with Key Stakeholders

I&APs and Key Stakeholders were identified prior to the Scoping Phase of the project. The identification and engagement if necessary, of I&APs and Key Stakeholders will continue through into the Scoping and EIA Phase of the project as the public participation process is a continuous process that runs throughout the duration of an environmental investigation.

In terms of engagement with the competent authority, the Department of Environment, Forestry and Fisheries (DEFF) has been engaged throughout the project in the form of meetings, telephone calls and follow-up emails. The DEFF will be provided with an opportunity to comment on the draft reports and will also be invited to attend the public meetings associated with the project. A pre-application meeting was held with the DEFF at the CDC on the 15th of August 2019. Please refer to Appendix 4.1 for the pre-application meeting minutes. Subsequent engagement with the DEFF will be as per the PPP tasks outlined in Table 7.6.

7.5.2 I&AP Database

All the information for I&APs (including contact details), together with dates and details of consultations and a record of all issues raised is recorded in a comprehensive database of I&APs. This database will be updated on an on-going basis throughout the stages of project development, and will act as a record of the communication/ involvement process.

7.5.3 Advertising

In terms of the EIA Regulations, the availability of the Draft Scoping Report and the Draft EIR (to be advertised) will be advertised in a local and provincial newspaper (The Herald) to ensure that the widest group of I&APs possible are informed of the project. Other advertisements to be placed during the course of the EIA Phase of the project will relate to the availability of reports for public review, the dates of public meetings, as well as the advertising of the environmental authorisation/decision.

The newspaper advertisement (during the Scoping and EIR Phase of the project) will notify the general public of the availability of the Draft EIR for a thirty (30) day public review period. The advertisement will include, but will not be limited to, a brief description of the proposed project, the main listed activities which are triggered by the proposed project, and the date, time and venue of the open day/public meetings. The advertisement will also encourage potential I&APs to register on the project I&AP Database and provide information on how to register as an I&AP.

7.5.4 Public Meetings

Due to the current COVID-19 restrictions in force by the government, no public meetings are planned to be held at this stage. However, **virtual meetings will be held with key stakeholders upon request**. Virtual platforms such as Zoom and Microsoft Teams are currently being used successfully to conduct virtual meetings. These applications allow for the recording of meetings and these recordings are then available for download. In addition, at least two (2) Environmental Liaison Committee (ELC) meetings will be conducted on a virtual platform (one conducted on 20

August 2020 and another to be conducted on 19 November 2020). In addition, to ensure full coverage of potential I&APs, a number of Background Information Documents have been delivered to the Ward Councillor's offices for distribution amongst the community. No radio advertisements will be run on local news stations at this stage as the closest community to the CDC is approximately 7 km to the west (Motherwell).

7.5.5 Issues and Response Trail

All issues, comments and concerns raised during the public participation process of the EIA process will be compiled into an Issues and Response Trail and incorporated and submitted as part of the Final Scoping Report.

7.5.6 Notification of Environmental Authorisation (EA)

Advertisements announcing the Environmental Authorisation will be placed in the same provincial and/or local newspaper used to announce the project and the EIA. The adverts will inform I&APs of the decision and where the Environmental Authorisation can be accessed. It will also draw their attention to their right to appeal the decision and set out the appeal procedures.

7.6 ENVIRONMENTAL IMPACT ASSESSMENT

To avoid the EIR being excessively long and cumbersome, whilst meeting the content requirements specified in the EIA Regulations, the final report will be divided into a number of volumes, as indicated in Table 7.6.

Table 7.6: Volumes that will be generated in the EIA phase for the proposed project.

Volume Number	Report	Contents
1	**Scoping Report**	As per the Final Scoping Report.
2	**Environmental Impact Assessment Report (EIR)**	**Introduction:** Detail of the environmental assessment practitioner who compiled the report and expertise of the EAP to carry out an environmental impact assessment **Description of the Project:** A description of the property on which the activity is to be undertaken, the location of the activity on the property and a description of the types of activities that are proposed for the development. **Description of the Affected Environment:** The natural environment, socio-economic environment and the legal, policy and planning setting. **The Public Participation Process:** Steps undertaken in order to notify and involve I&APs, advertisements, meetings held, issues and comments. **Summary of Comments and Response Trail:** Summary of comments and issues raised by I&APs and responses to the issues. **Summary of Specialist Reports:** Summary of the findings and recommendations of all specialist studies. **Alternatives Considered:** Description of all alternatives considered in the EIA, initial screening of alternatives, description and comparative assessment of all alternatives identified during the EIA. **Project related Impacts on Climate Change**

Volume Number	Report	Contents
		The Significance of Potential Environmental Impacts: The methodology used to determine the significance of environmental impacts, the impacts on the natural environment and the impacts on the socio-economic environment. **Environmental Impact Statement:** A summary of the key findings of the EIA and a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives. **Conclusions:** An opinion as to whether the activity should or should not be authorised and any conditions that should be made in respect to any form of authorisation.
3	**Specialist Studies**	This volume will be a compilation of all the specialist studies undertaken in the EIA, and will include the specialist studies listed in Section 7.3 above plus any additional specialist studies required by the Competent Authority.
4	**Environmental Management Programme Report (EMPrs)**	**Introduction:** The details of the EAP who prepared the EMPr, the expertise of the EAP who prepared the EMPr and a detailed description of the aspects of the activity covered by the EMPr. **Mitigation Measures and Actions:** Planning and design, pre-construction and construction activities and operational phase actions to be undertaken. **Responsibilities:** Persons responsible and time periods for implementation. **Monitoring Programme**

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