COEGA DEVELOPMENT CORPORATION (CDC) GAS TO POWER INFRASTRUCTURE, EASTERN CAPE PROVINCE

DFFE Reference Number: 14/12/16/3/3/2/2265

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PREPARED FOR:

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Environmental Assessment Practitioner (EAP) Details:

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EAP Declaration

- I act as the independent environmental practitioner in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not;
- All of the particulars furnished by me in this form are true and correct; and
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations.

ENVIRONMENTAL CONSULTANT	RESPONSIBILITY	DATE
Alan Carter	*Project Leader*	February 2023
Luc Strydom	*EAP, Project Manager & Author*	February 2023
Sage Wansell	*Public Participation*	February 2023

THE CONTENTS OF AN ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CONTENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (APPENDIX 3, NEMA EIA REGULATIONS)		
3. (1) An environmental impact assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include –		
	CONTENT	**SECTION OF THIS REPORT**
(a)	**Details of –**	***Chapter 1 and Appendix J***
(i)	The EAP who prepared the Report.	
(ii)	The expertise of the EAP, including a *curriculum vitae*.	
(b)	**The location of the development footprint of the activity on the approved site as contemplated in the scoping report, including –**	***Chapter 2***
(i)	The 21-digit Surveyor General code of each cadastral land parcel.	
(ii)	Where available, the physical address and farm name.	
(iii)	Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	
(c)	**A plan which locates the proposed activity or activities applied for as well as the associated infrastructure at an appropriate scale, or, if it is –**	***Chapter 2 & Appendix B***
(i)	~~A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken.~~	
(ii)	~~On land where the property has not been defined, the coordinates within which the activity is to be undertaken.~~	
(d)	**A description of the scope of the proposed activity, including –**	***Chapter 2***
(i)	All listed and specified activities triggered and being applied for; and	
(ii)	A description of the activities to be undertaken, including associated structures and infrastructure.	
(e)	**A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.**	***Chapter 4***
(f)	**A motivation for the need and desirability for the proposed development, including the need and desirability for the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report.**	***Chapter 3***
(g)	**A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report.**	***Chapter 3 and Chapter 6***
(h)	**A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including –**	***Chapter 6***
(i)	Details of the development footprint alternatives considered.	***Chapter 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.	***Chapter 9 and Appendix A***
(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.	***Chapter 9, Appendix A and Appendix H***
(iv)	The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	***Chapter 5***
(v)	The impacts and risks identified 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.	***Chapter 7 & Chapter 8***

(vi)	The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks.	
(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)	If no alternative development footprints for the activity were investigated, the motivation for not considering such.	
(x)	A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report.	
(i)	**A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including –**	
(i)	A description of all environmental issues and risks that were identified during the environmental impact assessment process.	
(ii)	An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adopted mitigation measures.	
(j)	**An assessment of each identified potentially significant impact and risk, including –**	
(i)	Cumulative impacts	***Chapter 7 & Chapter 8***
(ii)	The nature, significance and consequences of the impact and risk	
(iii)	The extent and duration of the impact and risk.	
(iv)	The probability of the impact and risk occurring.	
(v)	The degree to which the impact and risk can be reversed.	
(vi)	The degree to which the impact and risk may cause irreplaceable loss of resources.	
(vii)	The degree to which the impact and risk can be mitigated.	
(k)	**Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;**	
(l)	**An environmental impact statement which contains –**	
(i)	A summary of the key finding of the environmental impact assessment.	
(ii)	A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers.	
(iii)	A summary of the positive and negative impacts and risks of the proposed activity and identified alternative.	
(m)	**Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation**	***Chapter 10***
(n)	**The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment**	
(o)	**Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation**	
(p)	**A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.**	
(q)	**A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation**	

(r)	**Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised**	
(s)	**An undertaking under oath or affirmation by the EAP in relation to –**	***Appendix A***
(i)	The correctness of the information provided in the report.	
(ii)	The inclusion of comments and inputs from stakeholders and I&APs.	
(iii)	The inclusion of inputs and recommendations from the specialist reports where relevant; and	
(iv)	Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	
(t)	**Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.**	
(u)	**An indication of any deviation from the approved scoping report, including the plan of study, including –**	***None at this stage***
(i)	Any deviation from the methodology used in determining the significance of potential environmental impacts and risks	
(ii)	A motivation for the deviation.	
(v)	**Any specific information that may be required by the competent authority.**	***Throughout this Report***
(w)	**Any other matters required in terms of section 24 (4) (a) and (b) of the Act.**	***None at this stage***

LAYOUT AND LOCALITY MAP

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

Locality

Proposed LNG Hub site

Proposed Pipeline Infrastructure

N
W
E
S

Kilometers

0 0,5 1 2

CDC Gas to Power Infrastructure

Scale: 1:50 000

Datum: WGS 1984 UTM Zone 35S

LAYOUT COMPARISON MAP

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

Infrastructure Layout

- Proposed LNG Hub site
- Gas Pipelines
- Firewater Pipeline
- Cryogenic Pipelines

LNG Hub

- 1: Weighbridge
- 2: Road Loading Facility
- 3: 160000 m³ LNG storage tank
- 4: Cold Vent
- 5: Vent Snuff
- 6: Maintenance workshop & Stores
- 7: Admin Office and Control Room
- 8: Utilities Stand
- 9: Yard
- 10. Pig Launcher
- 11: Gas Chromatograph

Meters

0 500

CDC Gas to Power Infrastructure

Scale: 1:16 000

Datum: WGS 1984 UTM Zone 35S

LIST OF FIGURES

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1 INTRODUCTION

1.1 BACKGROUND INFORMATION

The Coega Development Corporation (CDC) proposes to develop a Gas to Power project, including three power plants and associated infrastructure, within the Coega Special Economic Zone (SEZ) (see Figure 2-1 to Figure 2-3 for site locality of gas infrastructure components).

An EIA process was undertaken in 2020/2021 (DFFE Ref: *14/12/16/3/3/2/1131*) for the Coega Gas to Power Infrastructure project, and the Final Scoping Report was accepted by DFFE on 6 January 2021. Ultimately though, environmental authorisation was refused due to incorrect proof of landowner consent and insufficient information within the EIR for the Department to make a decision.

The overall project would broadly involve the following components:

- A Liquefied Natural Gas (LNG) terminal, consisting of a berth with off-loading arms within the Port of Ngqura, cryogenic pipelines, storage and handling facilities and re-gasification modules (both on and off-shore)
- Gas and LNG pipelines and distribution hub, for the transmission, distribution and reticulation of natural gas within the Coega SEZ and Port of Ngqura - the subject of this EIA
- Three Gas to Power plants, each with a 1000 MW generation capacity (specific generation technologies may vary)
- Electricity transmission lines to evacuate electricity to the previously approved 400 kV lines in the SEZ.

The CDC's proposed gas to power project will comprise of three power plants with power generation capacities of up to 1000 MW each. A total power generation capacity of up to 3000 MW will therefore be available once the full extent of the project has been developed (which may be spread over a number of phases in a modular fashion, each with a generation capacity of approximately 500 MW, which may also be broken down into smaller sub-phases), the timing of which is unknown at this stage and is dependent on the CDC securing successful clients for the development of each component.

This Draft Environmental Impact Report (Draft EIR) deals only with the construction and operation of the gas infrastructure components of the project, facilitating the supply of gas to the power plants, and the transmission of gas and LNG to third party off-takers.

As developers and their chosen technologies for the gas to power plants have not yet been identified, various technologically feasible options are applied for, and the assessment presented is based on the worst case scenario for each impact. The aim of this approach is to identify the envelope limits within which the project impacts will fall, and which will be acceptable to the receiving environment with implementation of mitigation measures where relevant.

The NEMA and the Environmental Impact Assessment (EIA) Regulations, 2014 (promulgated in terms of NEMA) warrant that listed activities require Environmental Authorisation (EA). The Department of Forestry Fisheries & the Environment, (DFFE) is the competent authority for projects supplying energy to the national grid. A Scoping and Environmental Impact Reporting (S&EIR, also referred to as an EIA) process is required to support an application for EA.

1.2 PURPOSE OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIR)

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

(a) Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
(b) Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;
(c) Identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
(d) Determine the—

(i) Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
(ii) Degree to which these impacts—

(aa) Can be reversed;
(bb) May cause irreplaceable loss of resources, and
(cc) Can be avoided, managed or mitigated;

(e) Identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;
(f) Identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;
(g) Identify suitable measures to avoid, manage or mitigate identified impacts; and
(h) Identify residual risks that need to be managed and monitored".

The EIA Report documents the steps undertaken during the Impact Assessment Phase to assess the significance of potential impacts and determine measures to mitigate the negative impacts and enhance the benefits (or positive impacts) of the proposed project. The report presents the findings of the Impact Assessment Phase and the public participation that forms part of the process.

The EIA Report is accompanied by an Environmental Management Programme (EMPr), which documents the management and monitoring measures that need to be implemented during the design, construction and operational phases of the project to ensure that impacts are appropriately mitigated, and benefits enhanced.

More specifically, the objectives of this EIA Report are to:

- Inform the stakeholders about the proposed project and the EIR (also referred to as EIA) process followed
- Obtain contributions from stakeholders (including the applicant, consultants, relevant authorities and the public) and ensure that all issues, concerns and queries raised are fully documented and addressed
- Assess in detail the potential environmental and socio-economic impacts of the project
- Identify environmental and social mitigation measures to address the impacts assessed
- Produce an EIA Report that will assist DFFE to decide whether (and under what conditions) to authorise the proposed development.

1.3 NATURE AND STRUCTURE OF THIS REPORT

The structure of this report is based on Appendix 3 of GN R. 982 (326), of the EIA Regulations (2014 and subsequent 2017 amendments), which clearly specifies the required content of an Environmental Impact Assessment Report (EIR).

This report is the second of a number of reports which will be produced during the EIA Process. The Scoping Report, which was completed and accepted by the department in January 2021 during the previous application process as mentioned above. The EIA phase (phase 2) includes an EIR (prepared in accordance with Appendix 3 of GN R. 982), specialist reports (prepared in accordance with Appendix 6 of GN R. 982) and an Environmental Management Programme (EMPr) (prepared in accordance with Appendix 4 of GN R. 982). This phase must also undergo Public Participation Process in accordance with Chapter 6 of GN R. 982.

1.3.1 STRUCTURE

The structure of this EIR is as per Table 1-2 below.

Table 1-2: Structure of the EIR

CHAPTER	HEADING	CONTENT
1	**Introduction**	Provides a brief overview of the proposed development, details of the EAP and project team and purpose of the EIA report.
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.
3	**Need and Desirability**	A description of the need and desirability/motivation for the project.
4	**Legal and Policy Framework**	Identifies all the legislation and guidelines that have been considered in the preparation of this EIA Report. In addition, this chapter includes a description of the EIA process.
5	**Environmental Baseline**	Provides a brief overview of the bio-physical characteristics of the site and its environs that may be impacted by the proposed development, compiled largely from published information.
6	**Alternatives**	A description of the fundamental alternatives, incremental alternatives and the no-go alternative considered during all phases of the proposed development have been detailed in this Chapter.
7	**Findings of the Specialist Reports**	This chapter provides a summary of the key findings of each specialist assessment conducted as part of the EIA phase.
8	**Impacts and risks identified during the EIA phase**	Provides a description of the key impacts that have been identified by the project team and through discussions with I&APs thus far in the EIA Phase. In addition, this chapter covers the impacts identified by each specialist assessment. This chapter also includes mitigation measures that must be implemented. The chapter also describes the cumulative assessment methodology and a summary of the cumulative impacts as identified by each specialist assessment and in general by the EIA phase. This chapter also includes mitigation measures that should be implemented.
9	**Public Participation**	This chapter describers the Public Participation Process (PPP) conducted to date and that will be conducted as part of the EIA phase.
10	**Conclusions and Recommendations**	Concludes the report and provides recommendations on the way forward.

11	**EAP Affirmation**	EAP Affirmation and Declaration
12	**Appendix A**	PPP Documentation. Please note that the submitted comments and reports have been included as Appendix I due to volume.
13	**Appendix B**	Layout Drawings
14	**Appendix C**	Full impacts tables (A3)
15	**Appendix D**	Specialist reports and appendices
16	**Appendix E**	Specialist declarations
17	**Appendix F**	External review letters and appendices
18	**Appendix G**	Environmental Management Programme (EMPr) prepared in accordance with Appendix 4 of the EIA Regulations 2014, as amended. And a Generic EMPr prepared due to the presence of overhead lines.
19	**Appendix H**	Issues & Response Trail (IRT)
20	**Appendix I**	Comments and reports summitted by I&APs as per the IRT
21	**Appendix J**	Curriculum vitae of EAP team

1.3.2 Assumptions and Limitations

EIR

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit–

- This report is based on a project description and site plan, provided to CES by the applicant, which has not been approved by DFFE at this stage of the project. The project description and site plan may undergo iterations and refinements before being regarded as final. A project description based on the final design will be concluded once DFFE has provided feedback on the layout provided in this report
- Descriptions of the natural and social environments are based on limited fieldwork and available literature
- It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the accompanying maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken
- The following assumptions were made during the EIA process and the EIR assumes that:
- Due to the cost of preparing detailed designs and plans, such detailed design/ planning information would only be developed in the event of EA being granted. As such, it is anticipated that, as is typically the case in an EIA process, the EIA will assess broad land uses and concept designs
- The project, as described in this report, is viable from an engineering design perspective, as well as economically, and that the project has been correctly scoped to align with other infrastructure that is outside the scope of this EIA such as the CDC Marine Pipeline Servitude EIA
- a worst case scenario approach is adopted in assessing the various aspects of the project so that the impacts assessed will cover whatever option is put forward by the chosen bidder
- where overlaps in location occur, all mining operations with existing mineral rights will have ceased prior to commencement of construction activities for the CDC's Gas to Power project

In addition, the following aspects are excluded from the scope of work:

- Sources of gas – we assume LNG would be imported from suitably authorised sources
- An evaluation of different energy sources as part of the energy generation mix, apart from interim use of liquid fuel. It is assumed, based on the IRP, that this has been decided at a strategic level, and it is assumed this included an assessment of environmental factors. Apart from describing the

motivation (or need) for gas generated power as part of the energy mix, this assessment will not consider relative merits of different energy sources

- The transmission of electricity from the power plants to the Grassridge and/or Dedisa substations – it is understood that the bulk powerlines required for this are already authorised (DEA Ref: 12/12/20/781) and therefore will not be assessed as part of this EIA
- Activities (or the equivalent listed activities at the time) previously authorised via separate EIA processes for the whole SEZ, including the clearing of vegetation, rezoning of land, and installation of bulk services infrastructure. Relevant listed activities are listed in Table 2-1 with reasons as to why they are not being applied for
- The evacuation of power from Grassridge and/or Dedisa substations to consumers.

SPECIALISTS

The assumptions and limitations provided by specialists in their relevant reports are as follows:

❖ **Air Quality Impact Assessment**

The following assumptions are relevant to the Atmospheric Impact Report (AIR):

- No ambient monitoring is done in this assessment, rather available ambient air quality data is used
- The Model Plan of Study (uMoya-NILU, 2020) describes the dispersion modelling methodology and has been accepted by the Licensing Authority
- The potential air quality impacts of the proposed Land-based LNG Terminal and Infrastructure Project is assessed for the plant only and for the plant with existing air pollution sources in the Coega SEZ as well as cumulative impacts of other similar projects in the SEZ
- The assessment of potential human health impacts is based on predicted (modelled) ambient concentrations of SO_2, NO_2, CO, PM_{10} and benzene against health-based National Ambient Air Quality Standard (NAAQS).

❖ **Quantitative Risk Assessment**

The Quantitative Risk Assessment (QRA) was based on the conceptual designs of the LNG importation pipeline routing and gas distribution centre. Furthermore, EIAs are intended to suggest mitigation which may alter the design and layout of the project. It is thus understood that detail designs would be required to complete the project for construction.

RISCOM used the information provided and made engineering assumptions as described in the document. The accuracy of the document would be limited to the available documents provided.

The assessment of cumulative risks reported in the QRA is limited to an assessment of the vessels in their moored positions and excludes risks associated with ship movements, which would typically be assessed in a marine transportation study. No claims are made in the QRA regarding the level of risk, and the acceptability of the risk, associated with ship movements within and outside of the Port.

The risk assessment excludes the following:

- Road transportation outside of the facility
- Natural events such as earthquakes and floods
- Ecological risk assessment
- An emergency plan

❖ **Climate Change Impact Assessment**

The Gas Distribution Infrastructure's vulnerability and resilience to climate change is assessed within the Climate Change Impact Assessment (CCIA) through an analysis of available datasets. The limited availability of data results in increased uncertainties regarding the full extent and accuracy of the possible climate change

impacts affecting the Gas Distribution Infrastructure's operations, its supply chain, the surrounding communities, and the surrounding environment.

The assessment of the vulnerability of the project to climate change is subject to further limitations, namely:

- The Gas Distribution Infrastructure's vulnerability and resilience to climate change is assessed within the Climate Change Impact Assessment (CCIA) through an analysis of available datasets. The limited availability of data results in increased uncertainties regarding the full extent and accuracy of the possible climate change impacts affecting the Gas Distribution Infrastructure's operations, its supply chain, the surrounding communities, and the surrounding environment.

The assessment of the vulnerability of the project to climate change is subject to further limitations, namely:

- The project lifetime is assumed to be 30 years
- The use of natural gas replaces the use of only coal as a fuel source as it would be more readily available to the market. The fuel could be used for various processes; such as boilers, heaters, electricity generation and furnaces.
- Based on past experiences of the Promethium Carbon team, the following were assumed to be immaterial towards the GHG footprint of the Gas Distribution Infrastructure during both construction and operation:
    - Mobile combustion associated with the use of vehicles on the project site
    - Stationary combustion from backup generators
    - Employee commuting
    - Quantity of construction and municipal waste generated, including the distance transported to landfill
    - Emissions associated to nitrogen and LPG use as blending agents

The CCIA is also subject to certain limitations listed below:

- This assessment was limited to a desktop study
- No modelling was done to determine LNG use patterns in South Africa
- No modelling was done to determine changes in emissions intensity of LNG production
- No climate change modelling was performed
- The impact of changing legislation was not considered
- The impact of a changing economy was not considered
- Detailed design document for the Gas Distribution Infrastructure were not available

The assessment of the vulnerability of the project to climate change is subject to further limitations, namely:

- The natural and social environments were limited to the area surrounding the Gas Distribution Infrastructure
- Only impacts on the direct value chain were assessed
- No modelling of climate change impacts was conducted
- Only impacts occurring during the lifetime of the project were considered

❖ **Noise Impact Assessment**

The following assumptions are relevant to the Noise Impact Report:

- The Gas Infrastructure will be operational for 24 hours per day
- The sound power levels for the operational equipment was chosen from similar plants. The client could not supply enough detailed information in this regard due to the final designs, suppliers and equipment not being finalised. The author therefore chose to use information from similar projects that he had access to. The author is however confident that the results fairly reflect the noise impact
- The structural details of the infrastructure is not known (building heights, cladding etc)
- A LNG supply vessel will enter the port accompanied by at least two tugs
- It is assumed that the eastern breakwater will not provide any attenuation as the noise sources will be above the top of the breakwater wall
- An LNG Carrier will dock for delivery every 3 days. These carriers have an assumed capacity of 140 000 m^3
- The FSRU's will be operational for 24 hours per day. Each will have a capacity of 170 000 m^3

❖ **Traffic Impact Assessment**

The scope of the Traffic Impact Assessment (TIA) only deals with vehicular traffic related impacts and excludes consideration of the following:

- Source of gas
- The transmission of gas via pipelines other than construction traffic related to implementation of such pipelines
- The provision of power to consumers from facilities to which gas is supplied

The TIA is based on a number of assumptions and is subject to certain limitations. These are as follows:

- That operational trip generation rates are based on information supplied by the prospective plant/facility operator
- That vehicle occupancy rates for the purposes of determining operational trip generation rates for transport modes are based on average vehicle occupancies used for the NMBM Transport demand model
- That construction trip generation rates are based on high level assessments of the proposed construction requirements for similar developments
- That access and road upgrading proposals are conceptual at this stage and subject to detail designs being developed in the event of environmental authorization being granted
- That the capacity analysis process is based on the highest peak hour traffic volumes of adjacent street traffic based on baseline traffic surveys undertaken for this project
- That trip distribution is based on the location of the development relative to the surrounding residential areas
- That the roads constructed in the SEZ and on which traffic generated by the development travel have been constructed to accommodate traffic volumes over their projected design life and that such roads are operating well below their design traffic class

Notwithstanding these assumptions it is the specialists view that the TIA provides a good description of the potential traffic issues associated with the proposed development.

- **Marine Impact Assessment**

The assumptions made in the Marine Impact Assessment (MIA) are:

- The MIA is based on the project description made available to the specialists at the time of the commencement of the study (engineering designs, construction approaches, discharge locations, temperatures, volumes, etc.)
- Some important conclusions and associated assessments and recommendations made in the MIA are based on generic descriptions of LNGC and FSRU water requirements, and seawater intake and discharge configurations. Similarly, the thermal footprints associated with discharges from the vessels are based on the results of modelling studies undertaken for similar projects elsewhere in the world. As the extent of such footprints are project-specific and determined by localised oceanographic conditions, field observations and subsequent monitoring would need to be implemented for the current project to determine if predicted discharges at the Ngqura LNG terminal fall within the scale of the predicted footprints. If field observations and monitoring, however, fail to mirror predicted results, the forecasted impacts may need to be re-assessed.
- Potential changes in the marine environment such as sea-level rise and/or increases in the severity and frequency of storms related to climate change are not included in the terms of reference and therefore not dealt with in this report. The climate change assessment has been undertaken by other consultants and is only briefly commented on in this report. Should evidence of such changes become available, the management plans should be re-examined to include the impacts of these anticipated macroscale changes.

1.4 Details and Expertise of the Environmental Assessment Practitioner

In fulfilment with the legislative requirements, the details of the Environmental Assessment Practitioner (EAP) and the environmental team that prepared this EIR are provided below.

1.4.1 Dr Alan Carter (Project Leader)

Dr Alan Carter is an Executive and the East London Branch Manager at CES. 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. Alan 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).

1.4.2 Mr Luc Strydom (EAP, Project Manager & Lead Author)

Luc has over 13 years of experience developing his skills and expertise and has been involved in a wide spectrum of projects and activities ranging from general environmental assessment work such as EIAs, ESIAs and EMPrs, environmental permitting (WULAs, trans-relocation permits, waste permits), geo-hydrological sampling, auditing (ECO & Performance Assessments) as well as specialist studies including freshwater impact assessments (wetlands and riparian assessments), terrestrial biodiversity assessments, vegetation impact assessments, botanical surveys, and related management plans (invasive alien species management plans, biodiversity management plans and rehabilitation plans. Luc has a particular interest in wetland ecology and botany.

1.4.3 Ms Sage Wansell (Co-Author & Public Participation)

Sage Wansell holds a Master of Science degree in Botany and has gained experience in field and laboratory work by researching invasive aquatic species in South Africa during that time. Her research focused on the ecology, spread and management strategies of an invasive wetland species called Pickerelweed. Apart from invasion biology research, Sage has a BSc Honours degree in Biotechnology. Her Biotechnology, botany and microbiology background provide an understanding of wastewater management, indigenous biodiversity and water quality. Sage joined CES in 2022 and is currently involved in several projects, these include Public Participation Plans (PPP), Basic Assessments and EIA's.

PLEASE FIND THE *CURRICULUM VITAE* ATTACHED AS APPENDIX J.

2 PROJECT DESCRIPTION

2.1 PROPOSED ACTIVITY

The proposed Gas Infrastructure will consist of all key supporting infrastructure required for the operation of the CDC's proposed Gas to Power plants in the Coega SEZ. This will be made up specifically of infrastructure for the import, storage and transmission of LNG via the Port of Ngqura, to the various power plants, and seawater for cooling to and from the Zone 10 power plants (should they be seawater cooled), and heating water to the onshore storage and regasification unit. Additional capacity of supply of LNG and natural gas (NG) to third party offtakers, potentially including the Dedisa peaking power plant, should this be converted to gas, will also be included. The key infrastructure includes the following:

- Up to two floating storage and regasification units (FSRUs), moored in the Port, which will receive, store and regasify the LNG from the LNG carrier. It is proposed that onshore storage and regasification facilities will replace the FSRUs once the demand for NG reaches a point where onshore storage and regasification is the more feasible option, at which point the FSRUs will be removed
- A new jetty with offloading platform and berthing facilities in the Port of Ngqura
- A trestle structure to support the gas and cryogenic pipelines running within the port from the offloading platform parallel to the eastern breakwater, to the point where the pipelines will cross under the breakwater near the admin craft basin, thereafter running underground
- A LNG and gas hub, consisting of storage and regasification facilities (for development once the FSRU is no longer the most feasible option), and a truck delivery centre for third party offtakers. Gas metering, admin, control rooms, workshops, and vents will be included in the LNG and gas hub
- Gas pipelines (for transmission of NG) from the FSRU and jetty to the three proposed power plants, the LNG and gas hub (for third party offtakers) as well as the boundary of the Dedisa power plant in Zone 13
- Cryogenic pipelines (for transmission of LNG) from the berthing facilities in the port to the storage and regasification unit at the LNG and gas hub (once this has replaced offshore storage and regasification at the FSRU)
- Pipelines for the transmission of seawater for cooling from the abstraction point in the port, to the Zone 10 power plants (if seawater cooled), and for heating to the regasification plant at the LNG and gas hub in Zone 10

Figure 2-1: Coega Gas to Power Infrastructure Layout

2.2 CONTEXT

A number of national policy documents present the case for natural gas as a significant contributor to South Africa's energy mix.

In support of the vision for the South African gas programme, the DMRE is developing an LNG to Power Independent Power Producer Procurement Programme (IPPPP). The LNG to Power IPPPP aims to identify and select successful bidders and enable them to develop, finance, construct and operate a gas-fired power generation plant at each of the two ports, Ngqura and Richards Bay. The LNG to Power IPPPP will provide the anchor gas demand on which LNG import and regasification facilities can be established at the Ports of Ngqura and Richards Bay. This will provide the basis for LNG import, storage and regasification facilities to be put in place that can be available for use by other parties for LNG import and gas utilisation development. Therefore, Third Party Access will be a fundamental aspect of the LNG to Power IPP Programme. This will enable the development of gas demand by third parties and the associated economic development. The DoE released a Preliminary Information Memorandum (PIM) in early October 2015, outlining the scope of the LNG to power projects.

In alignment with the future LNG IPPPP, the DMRE also recently released a 'Medium Term Risk Mitigation independent Power Producer Procurement Programme (RMIPPPP) which seeks 2GW of flexible power capacity. Projects awarded under this programme will also be required to align with a future LNG to power programme initiative.

The following studies were undertaken/considered for the development of a Gas to Power project in Coega:

1. CCGT Plant identified during the EIA for the Aluminium smelter

2. Power lines from the proposed CCGT site locality to Dedisa and Grassridge substations authorised in 2006 (Ref: 12/12/20/781)
3. 2004 – CSIR EIA started for a 1600 MW LNG Terminal and CCGT plant. Process stopped at Scoping stage
4. 2009 – Worley Parsons PFS for 3200 MW CCGT power plant in Coega IDZ linked to LNG terminal
5. 2016 – PRDW Pre-feasibility Report (FEL2) (DoE and TNPA): Importing of up to 3.96 mtpa into the Port of Ngqura
6. 2016 – Mott-MacDonald IPP LNG-to-Power project (DoE), for 2000 MW at Richards Bay and 999 MW at Coega
7. 2020 – WSP Techno-Economic Assessment Report Cooling Concept for 3x1000MW Gas Fired power plant

Following various pre-feasibility studies, the CDC initiated an expression of interest (EOI) process, inviting responses from interested parties with the requisite experience to deliver the project including:

- Receiving, storing, and re-gasifying LNG
- Delivering LNG to a modular power plant
- Design, procurement, construction, and operation of the power plant
- Power transmission at 400kV to the main SEZ sub-station
- The option of sourcing and transporting the LNG

The Gas to Power project site selection process considered the following criteria (CDC, 23 September 2015):

- The availability of fuel for the operational life of a power plant of at least 20 years. The level of confidence for these fuel reserves needs to be high and it must be feasible to transport the fuel to the proposed power plant in a reliable and cost effective manner. The quality parameters of the gas must be acceptable and fairly constant over the life of the proposed power plant. If power plant is not located at the source of the gas, then infrastructure to transport gas to the site must be available.
- Sufficient quantities of water must be available at the site, or it must be relatively straightforward to transfer to the site. The cost of the water must not be prohibitive. In most instances Gas to Power plants are built next to the sea. The availability of seawater is also required for regasification of the LNG (at the FSRU and later at the LNG & gas hub);
- Suitable and sufficient land on which to build the proposed power plant must be available as close as possible to the fuel source and to the users of electricity and should be able to help anchor the grid and reduce transmission losses where necessary;
- The distance to the national transmission system has to be evaluated. The cost of integrating into the existing network, the strengthening of that network and whether the upgrading of this network is compatible with the regional transmission system expansion plans; and
- The area where the proposed power plant is to be located must preferably be an area where the air quality is not already degraded. Whilst it is possible to mitigate atmospheric pollution, it is still preferable to avoid already highly stressed locations

The advantages of the Coega SEZ as a location for the proposed development, according to the CDC, are summarised in Table 2-1.

Table 2-1: Advantages of Coega SEZ as proposed development location

Alignment to National Strategic Drivers	The National Development Plan (NDP) envisages a South African energy sector that promotes economic growth, social equality and environmental sustainability by 2030. The Department of Mineral Resources and Energy's Integrated Resource Plan outlines gas-driven projects, which was further asserted by the 2012 Ministerial Determination allocation of 2,652 MW to be generated from Natural Gas between 2021 and 2025. This also supports the objectives of the Integrated Energy Plan, namely to: ensure the security of supply; minimise the cost of energy; increase access to energy; diversify supply sources and the primary sources of energy; minimise emissions from the energy sector; promote localisation and technology transfer and the creation of jobs. The IRP of 2019 further designates the procurement of 3,000 MW generated from gas.
World Class Site Location	❖ Coega SEZ consist of 14 zones with a total of 9,000 ha ❖ The proposed site for the two Zone 10 power plants (1,000 MW each) is in Zone 10 of the Coega SEZ, ±2 km from the deepwater Port of Ngqura and ±4 km from Eskom's Dedisa Substation ❖ The proposed site for the power plant (1,000 MW) in Zone 13 of the Coega SEZ is, ±5 km from the deepwater Port of Ngqura and adjacent to Eskom's Dedisa Substation ❖ In 2009 Coega conducted a 2,500 MW CCGT Pre-feasibility study as preliminary analysis of the suitability and viability (strategic, technical, financial, regulatory, legal and commercial), linked to LNG terminal ❖ This is in addition to the 342 MW Dedisa Peaking Power Project which can be converted into a gas-driven power plant ❖ Close proximity to Shale Gas Prospects in the Eastern Cape offer opportunities for long term integration
Progress on Environmental Authorisations (EA)	❖ EA for the rezoning of the Core Development Area of the Coega SEZ ❖ EA for the change in land use of the remainder of the SEZ ❖ Existing EA for 400 kV Transmission Line between Gas-to-Power Project site in Zone 10 and the Dedisa Substation ❖ LNG-to- Power Project -Draft Scoping report (2006) ❖ EIA completed for a marine pipeline servitude/ sea water intake for cooling ❖ EIA conducted for the establishment of nine 132kV powerlines between Grassridge Substation (Eskom) and Coega SEZ
Infrastructure Outlay	❖ Availability of land in rezoned SEZ ❖ Approved Coega Infrastructure Master Plan – defined services corridor from Project site to Dedisa Substation ❖ Good access to site via National Road (N2) and ancillary road network

Grid Connectivity	❖ Connection of the Gas-to-Power plant to the Dedisa sub-station via 400 kV lines into the national grid and at 765 kV, in future
Gas Pipeline Infrastructure	❖ Approved Coega Infrastructure Master Plan ❖ Planned Gas servitudes in defined Services corridor – 4 km from Coast to Dedisa Peaking power plant ❖ Integration to the Operation Phakisa Gas Infrastructure Planning
LNG Berth at Port of Ngqura	❖ Transnet National Ports Authority to conduct a feasibility study on the LNG terminal (receiving, storage & regasification) to be built, operated and managed by a licenced operator ❖ At least two LNG berth options identified in conceptual studies ❖ Strong linkages between the Shale Gas prospects, LNG terminal and Gas Infrastructure; ❖ Potential to host Power Barges
Socio-Economic Aspects for EC (Jobs & Skills)	❖ Increased Electricity generation in the Province & Balancing the Renewable Energy load - Stability of Electrical grid (Leading to confidence in province, thus stimulate economic growth) ❖ Reduced energy constraint as gas can be used directly in industrial complexes - Gas can be used for chemical products manufacturing (Job Creation & Skills Development)

In addition to the advantages of the Coega SEZ as the project location, as summarised by the CDC, the DMRE has noted the following reasons:

- The project is in line with a 2005 cabinet resolution;
- There is potential opportunity for other related projects;
- Sea water for cooling is readily available in proximity to the power plant site;
- Reduction in transmission losses to the Eastern Cape;
- A large amount of preparatory work had already done by CEF/iGas;
- Increased economic activity and employment creation that would lead to socio-economic development in the region;
- Attract new industries on the back of power availability;
- Within a 26 km radius of a wide variety of specialist component suppliers;
- Manufacturing clusters that facilitate backward and forward integration of supply chains

2.3 PROJECT LOCALITY

The proposed Gas Infrastructure is located in the Port of Ngqura, as well as Zones 10 and 13 of the Coega SEZ, with pipelines crossing Zones 8, 7, 6 and 11 as well. A map showing the various Zones of the Coega SEZ relative to the proposed development sites is provided in Figure 2-2 for reference. The specific property portions which are listed in Table 2-2.

Table 2-2: Coega Gas to Power Infrastructure Properties.

Gas Infrastructure	SG DIGIT NUMBER	FARM NUMBER/PORTION
LNG Hub	**C07600230000022000000**	Erf 220, Coega
	C07600230000025200000	Erf 252, Coega
Cryogenic and Natural Gas Pipelines	**C07600230000025500000**	Erf 255, Coega
	C07600230000032900000	Erf 329, Coega
	C07600230000022000000	Erf 220, Coega
	C07600230000025200000	Erf 252, Coega
	C07600230000028100000	Erf 281, Coega
	C07600230000027500000	Erf 275, Coega
	C07600230000032900000	Erf 329, Coega
	C07600230000031200000	Erf 312, Coega
Seawater Intake Pipeline, FSRU and Jetty	**C07600230000025100000**	
	C07600230000025500000	
	C07600230000035500000	

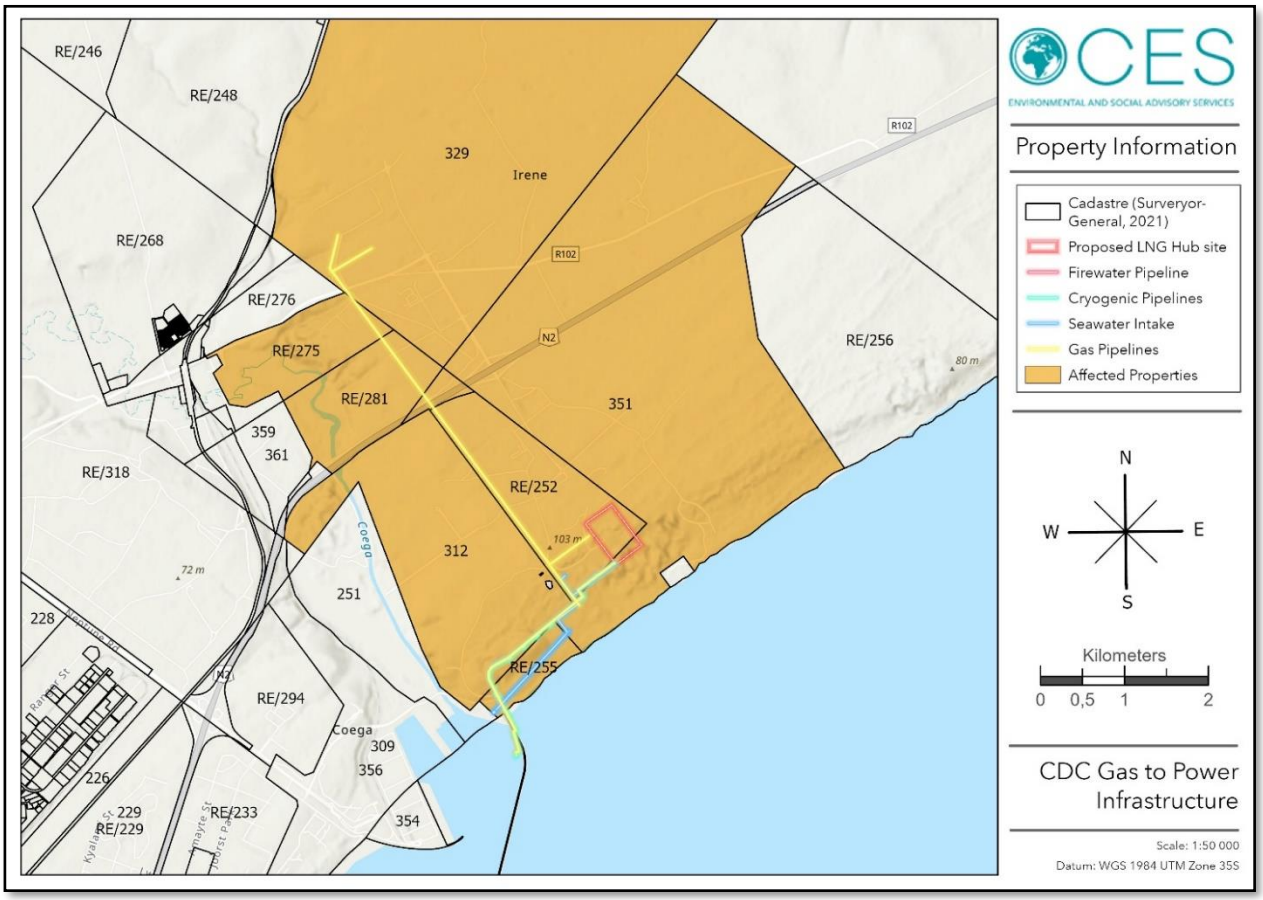
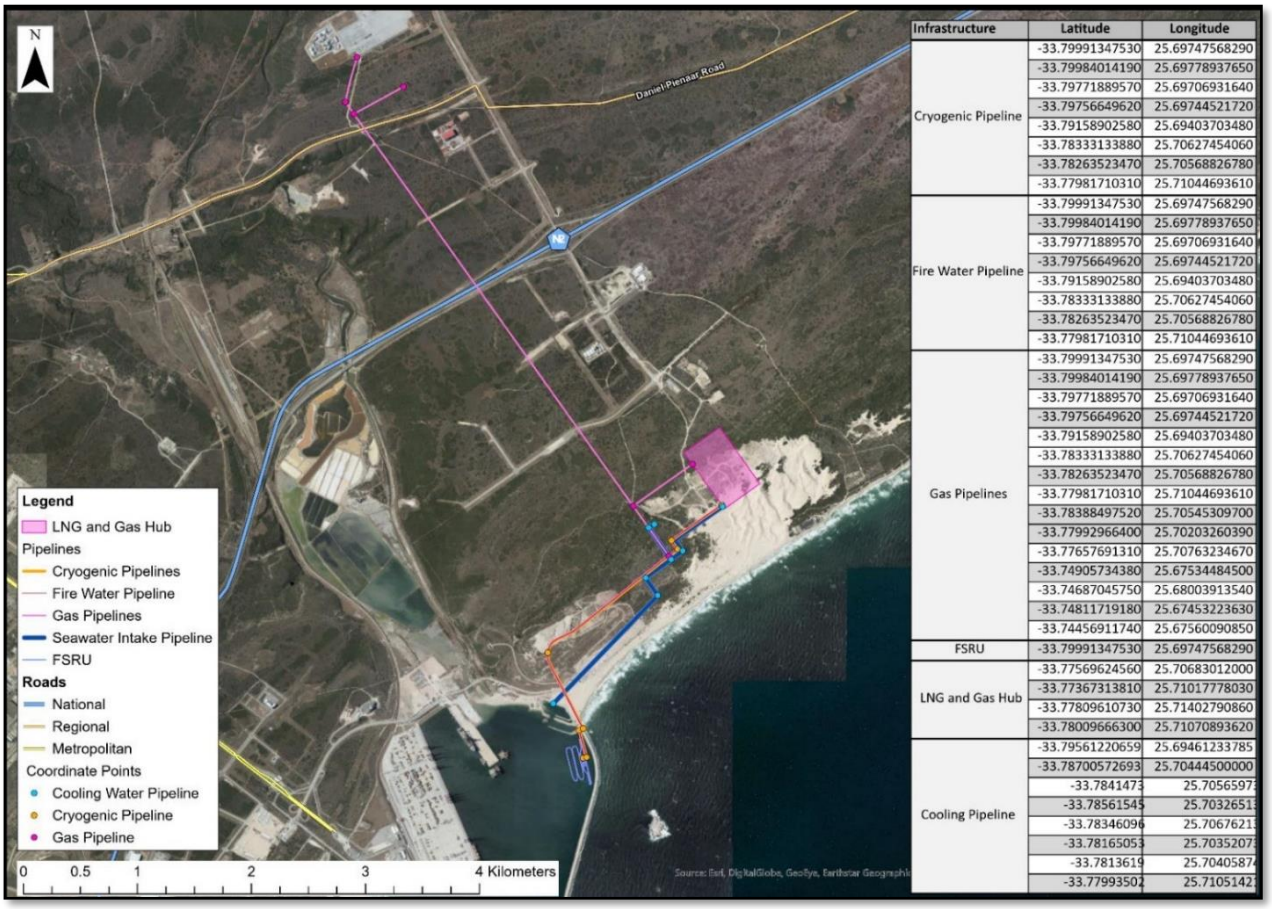


Figure 2-2: Cadastral Map of the Affected Properties within the Proposed Site.



Infrastructure	Latitude	Longitude
Cryogenic Pipeline	-33.79991347530	25.69747568290
	-33.79984014190	25.69778937650
	-33.79771889570	25.69706931640
	-33.79756649620	25.69744521720
	-33.79158902580	25.69403703480
	-33.78333133880	25.70627454060
	-33.78263523470	25.70568826780
	-33.77981710310	25.71044693610
Fire Water Pipeline	-33.79991347530	25.69747568290
	-33.79984014190	25.69778937650
	-33.79771889570	25.69706931640
	-33.79756649620	25.69744521720
	-33.79158902580	25.69403703480
	-33.78333133880	25.70627454060
	-33.78263523470	25.70568826780
	-33.77981710310	25.71044693610
Gas Pipelines	-33.79991347530	25.69747568290
	-33.79984014190	25.69778937650
	-33.79771889570	25.69706931640
	-33.79756649620	25.69744521720
	-33.79158902580	25.69403703480
	-33.78333133880	25.70627454060
	-33.78263523470	25.70568826780
	-33.77981710310	25.71044693610
	-33.78388497520	25.70545309700
	-33.77992966400	25.70203260390
	-33.77657691310	25.70763234670
	-33.74905734380	25.67534484500
	-33.74687045750	25.68003913540
	-33.74811719180	25.67453223630
	-33.74456911740	25.67560090850
FSRU	-33.79991347530	25.69747568290
LNG and Gas Hub	-33.77569624560	25.70683012000
	-33.77367313810	25.71017778030
	-33.77809610730	25.71402790860
	-33.78009666300	25.71070893620
Cooling Pipeline	-33.79561220659	25.69461233785
	-33.78700572693	25.70444500000
	-33.7841473	25.7056597
	-33.78561545	25.7032651
	-33.78346096	25.7067621
	-33.78165053	25.7035207
	-33.7813619	25.7040587
	-33.77993502	25.7105142

Figure 2-3: Co-ordinate points of the proposed gas infrastructure.

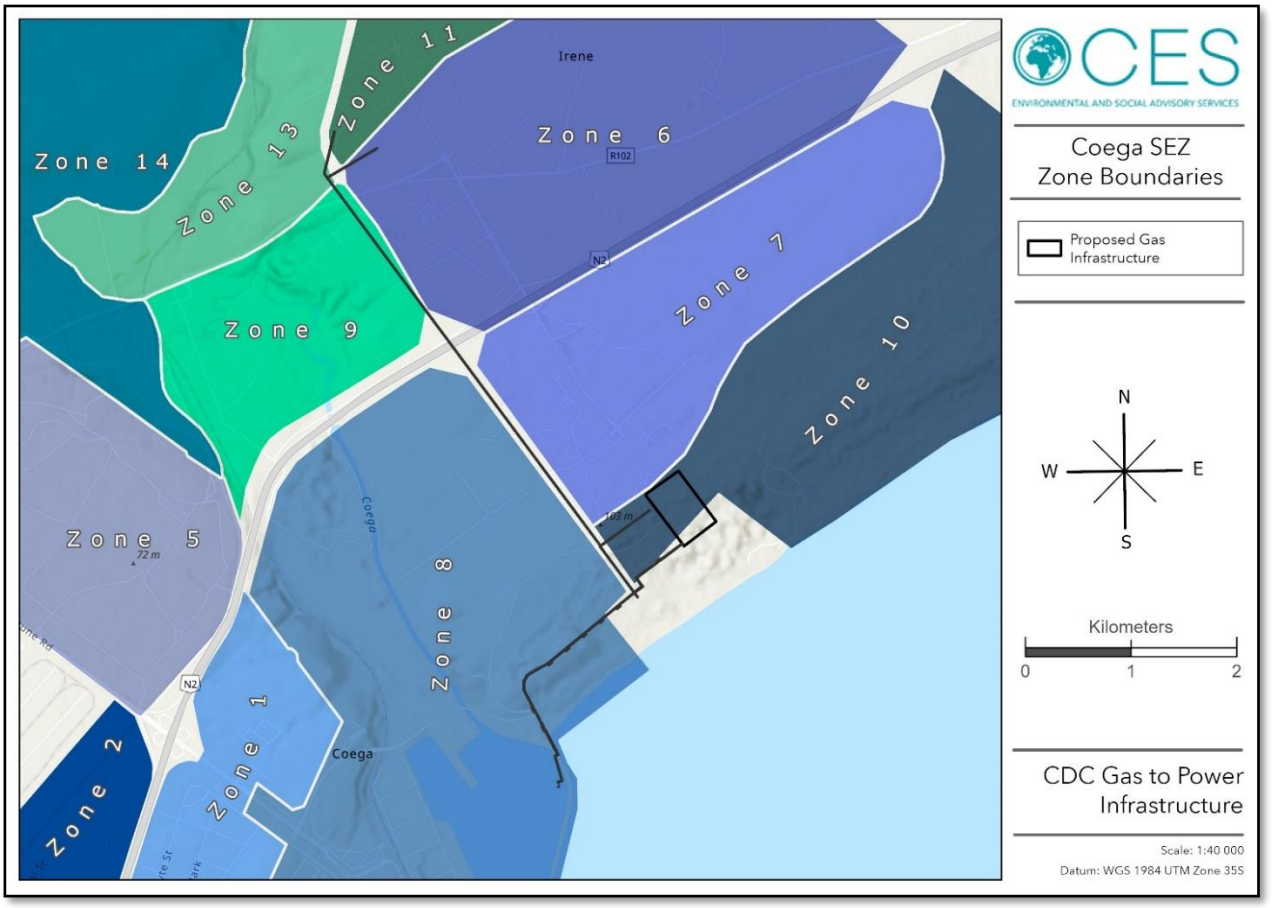


Figure 2-4: Coega SEZ Zone Boundaries.

2.4 KEY TERMINOLOGY

This section presents a short non-technical description of key terms and acronyms used throughout this report as a primer for the detailed project description to follow in Section 2.5.

2.4.1 LIQUIFIED NATURAL GAS (LNG)

Natural gas used for energy generation is primarily methane, with low concentrations of other hydrocarbons, water, carbon dioxide, nitrogen, oxygen and some sulphur compounds. LNG is natural gas which has been cooled below its boiling point (-161°C) in a process known as liquefaction. The process of liquefaction involves extracting most of the impurities in raw natural gas. The remaining natural gas is primarily methane with only small amounts of other hydrocarbons and consequently is widely considered a clean fossil fuel.

The quality of LNG is determined by means of gas specifications, and in particular the Wobbe Index (WI)(an indicator of the interchangeability of fuel gases). Imported gas, particularly from different sources, may need to be treated to achieve the same quality. Blending with nitrogen would make the LNG leaner, or alternatively if already too lean, the gas would need to be blended with liquid petroleum gas (LPG). Assuming all imported LNG falls within the range of allowable WI for Gas Turbines, conditioning via Nitrogen or LPG would be required to control the rate of change of WI when swapping between LNG sources. Gas Turbines typically allow a relatively wide WI band, however approx. 0,5% WI change per second. To achieve this rate of change, approx. 1.7 tonnes of LPG and 1.3 tonnes of Nitrogen (worst case + buffer capacity) would be required to change over between fuel specs. This conditioning of the LNG would take place at the FSRU (phase 1 of Gas Infrastructure development) or the LNG and gas hub (phase 2 of Gas infrastructure development), prior to the gas being transmitted to each power plant.

Regasification is the opposite of liquefaction and involves the warming of LNG to the point where it becomes a gas. This process occurs naturally at ambient air temperatures (known as “boil off”), and is expedited by passing LNG through warmer media.

2.4.2 LIQUIFIED NATURAL GAS CARRIER

Liquefied Natural Gas Carriers (LNGC) are ships designed for the transportation of LNG. The LNG is stored in specially insulated tanks (to maintain temperature below -162°C) inside the double hull of the ship to protect the cargo systems from damage or leaks.

The size and type of LNGC is dependent of the supplier of LNG (and ships are excluded from the scope of the EIA process). Mott MacDonald conducted ship modelling studies assuming vessels of 140,000 m^3 and determined that for a 999 MW CCGT power plant 10.3 ships per annum would be required. It is estimated (Carnegie Energie, 2019) that, for 3,000 MW of generating capacity 80% of the time, and making an allowance for third party off take and supply to Dedisa (i.e.: the “maximum case” scenario), that one LNGC delivery every three days would be required (or ±95 deliveries per annum).

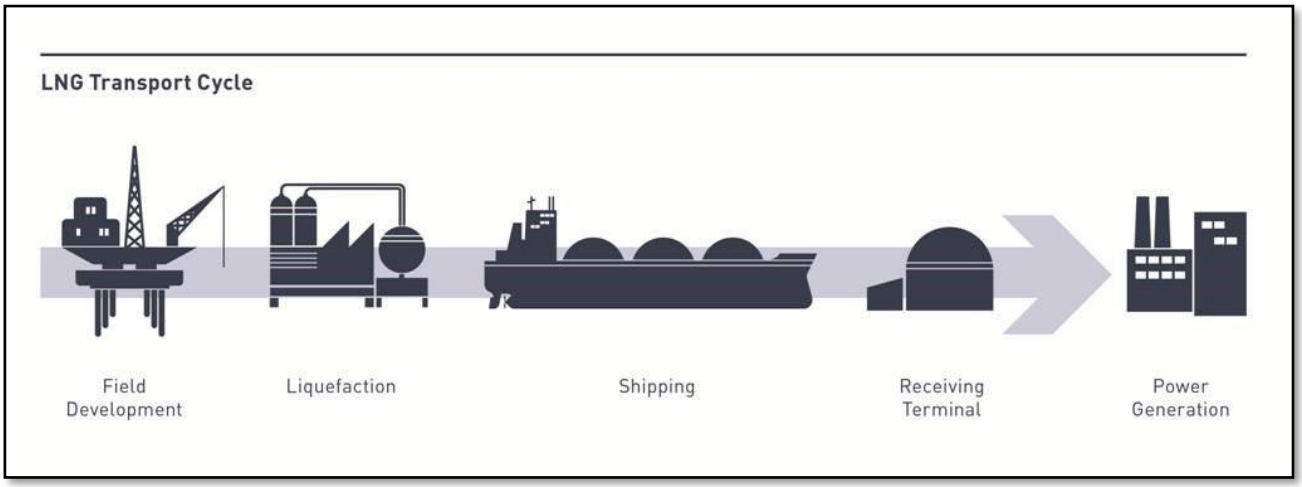


Figure 2-5 : LNG Transport Cycle (Suarez, 2018)

2.4.3 Floating Storage Regassification Unit (FSRU)

An LNG Floating Storage and Regasification Unit (FSRU) is a specialised ship that is able to store and regasify LNG on board. Floating regasification requires either an offshore terminal, which typically includes a buoy and connecting undersea pipelines to transport regasified LNG to shore, or an onshore dockside receiving terminal (Zaretskaya, 2015). The FSRU remains permanently moored at a jetty or via single point mooring and is refuelled by a LNGC. LNG transfer from a LNGC to the FSRU can take place either side by side, through a jetty, or in tandem. The transfer system can either be through loading arms or flexible hoses. The FSRU is generally considered to be quicker to develop and require less capex but more opex than onshore regasification facilities. However, as the project develops and increased volumes of gas are required for the power plants it is expected that land-based storage and regasification will become more economical and that the FSRU will in time be replaced by land-based infrastructure.

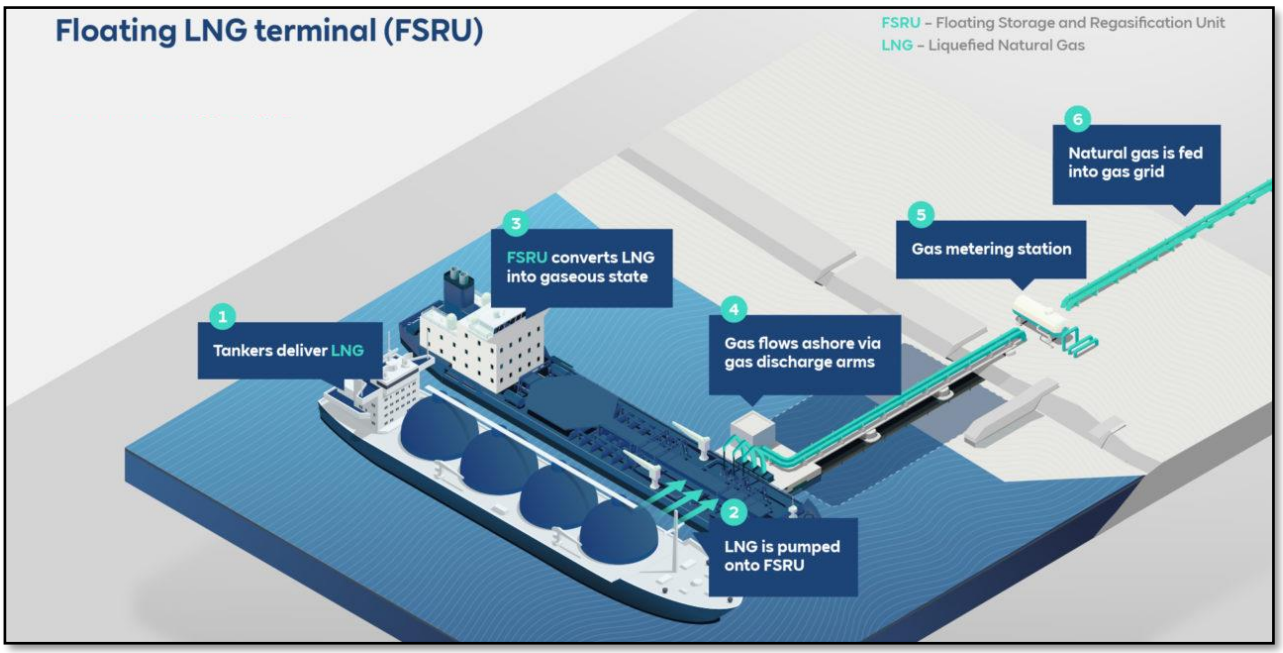


Figure 2-6: Illustration depicting gas distribution process from LNGCs using FSRUs (RWE, 2022)

2.4.4 Cryogenic Pipeline

For ease of transport, Natural Gas (NG) is stored and transported in tanks as a cryogenic liquid (LNG), i.e. as a liquid at a temperature below its boiling point (-162°C) at close to atmospheric pressure. The transportation of LNG by pipeline (e.g. from a LNGC to a land-based storage and regasification plant or third party offtakers) requires insulated pipelines to minimise and capture Boil-Off Gases (BOG). Cryogenic pipelines are significantly more expensive than natural gas pipelines.

2.4.5 Buffer Volume and Buffer Time

Buffer volume is the stored volume of LNG (e.g. in the FSRU and/or in land-based storage) required for continuous supply of LNG to the power plant and below which an LNGC is required to berth. Buffer time is the duration between the stored volume of LNG falling below the buffer volume and the depletion of stored LNG. The buffer volume provides a safety margin should berthing of the LNGC be delayed, e.g. due to exceedance of berthing and/or offloading operational limits.

2.4.6 Boil Off Gas (BOG)

LNG is stored and transported in tanks as a cryogenic liquid, but even with effective insulation, part of the LNG reaches its boiling point and begins to evaporate creating BOG comprised largely of methane.

In the complete LNG cycle for marine bunkering, the amount of BOG created is a function of how long the LNG is held in the supply chain, the size and specification of the containers used, and the number and methods of transfers of LNG from one storage container to another. The longer LNG is stored before being used, and the more times it is transferred from one storage vessel to another, the more BOG is created. There are four main methods for dealing with the BOG created during LNG storage and handling: (1) releasing it to the atmosphere (also known as venting); (2) flaring; (3) capturing it for use as gaseous fuel, or (4) capturing and re-liquefying it.

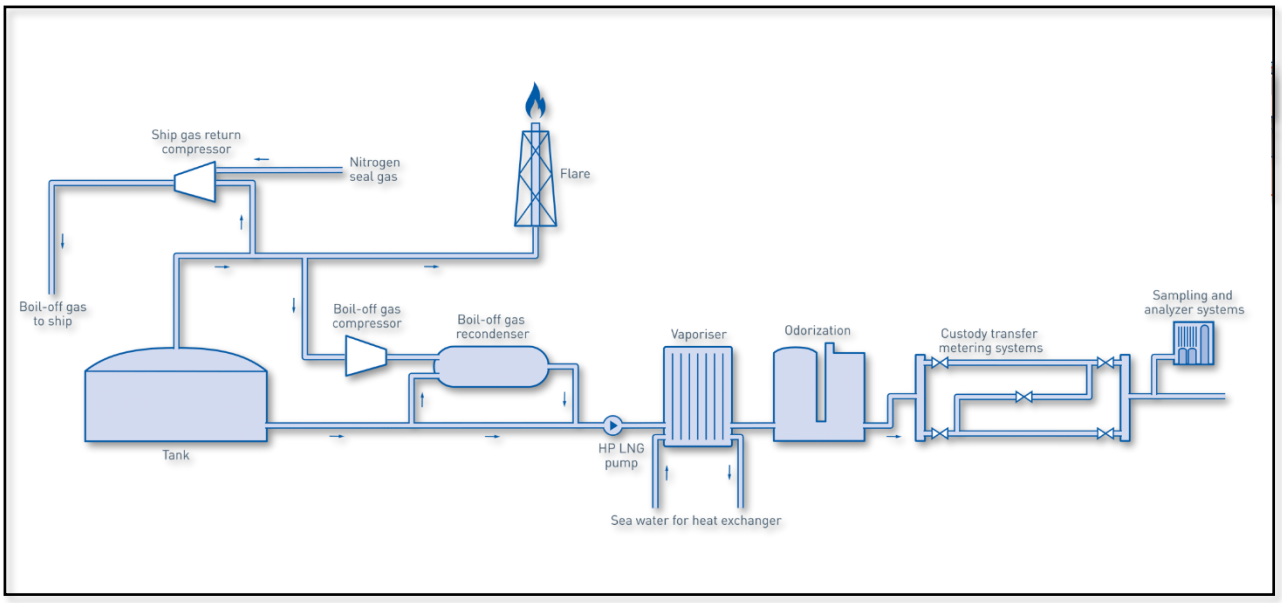


Figure 2-7: Basic LNG regassification process layout (Krohne (Japan), 2022)

2.5 Detailed Project Description

The proposed gas infrastructure will consist of all key supporting infrastructure required for the operation of the CDC's proposed gas to power plants in the Coega SEZ. This will be made up specifically of infrastructure

for the import, storage and transmission of LNG via the Port of Ngqura, to the various power plants, and seawater for cooling to and from the Zone 10 power plants (should they be seawater cooled) and heating water to the onshore storage and regasification unit. Additional capacity of supply of LNG and natural gas (NG) to third party off takers, potentially including the Dedisa peaking power plant, should this be converted to gas, will also be included. The key infrastructure includes the following:

- Up to two floating storage and regasification units (FSRUs), moored in the Port, which will receive, store and regasify the LNG from the LNG carrier (LNGC). It is proposed that onshore storage and regasification facilities will replace the FSRUs once the demand for NG reaches a point where onshore storage and regasification is the more feasible option, at which point the FSRU will be removed
- A new jetty with offloading platform and berthing facilities for the FSRU and LNGC in the port of Ngqura
- A trestle structure to support the gas and cryogenic pipelines running within the port from the offloading platform parallel to the eastern breakwater, to the point where the pipelines will cross under the breakwater near the admin craft basin, thereafter running underground;
- A LNG and gas hub, consisting of storage and regasification facilities (for expansion of the gas infrastructure, once the FSRU is no longer the most feasible option for LNG storage and regasification), and a truck delivery centre for third party off-takers. Gas metering, admin, control rooms, workshops, and vents will be included in the LNG and gas hub;
- Gas pipelines (for transmission of NG) from the FSRU and jetty to the three proposed power plants, the LNG and gas hub (for third party offtakers) as well as the boundary of the Dedisa power plant in Zone 13;
- Cryogenic pipelines (for transmission of LNG) from the berthing facilities in the port to the storage and regasification unit at the LNG and gas hub (once this has replaced offshore storage and regasification at the FSRU); and
- Pipelines for the transmission of seawater from the abstraction point in the port, to the Zone 10 power plants (if seawater cooled) and regasification plant at the LNG and gas hub in Zone 10 (for heating water).

A generic process flow diagram showing the expansion of Gas Infrastructure establishment (initially, with off-shore storage and regasification of LNG in a FSRU followed by development of an onshore storage and regasification facility at the LNG & gas hub, is provided in Figure 2-7.

2.5.1 LNG TERMINAL

An LNG terminal will need to be constructed at the Port of Ngqura to accommodate the LNG transport/storage vessels and offloading operations. The marine components of the development are further discussed in the sections below. The proposed site for the LNG terminal is located within and at the base of the eastern breakwater, seaward of the Admin Craft Basin (ACB) in the port. LNG terminals are predominantly constructed as piled structures. This standard design was used as a baseline for the development of the proposed terminal. A review was undertaken by PRDW in 2016, which determined that a piled jetty structure design was the most feasible, and which recommended the following:

- An access trestle with road and provision for pipelines and services: approximately 283 m long by 5 m wide deck on piled access trestle
- A platform with provision for distribution of natural gas and future conversion to distribution of cryogenic LNG
- Mooring and berthing dolphins, to protect the berth infrastructure from impact

A separate platform area will be required when converting the FSRU terminal to a LNGC terminal, as the manifold positions on FSRU and LNGC vessels differ. A platform area of 20 m by 30 m has been allocated for the distribution of gas and was based on the space requirements for the plant and equipment.

A large amount of plant and equipment will be needed for the distribution of cryogenic LNG, and will require a substantial area of platform space. A separate platform of 40 m by 30 m, constructed for the distribution of gas, was allocated for typical plant and equipment required on the LNG platform.

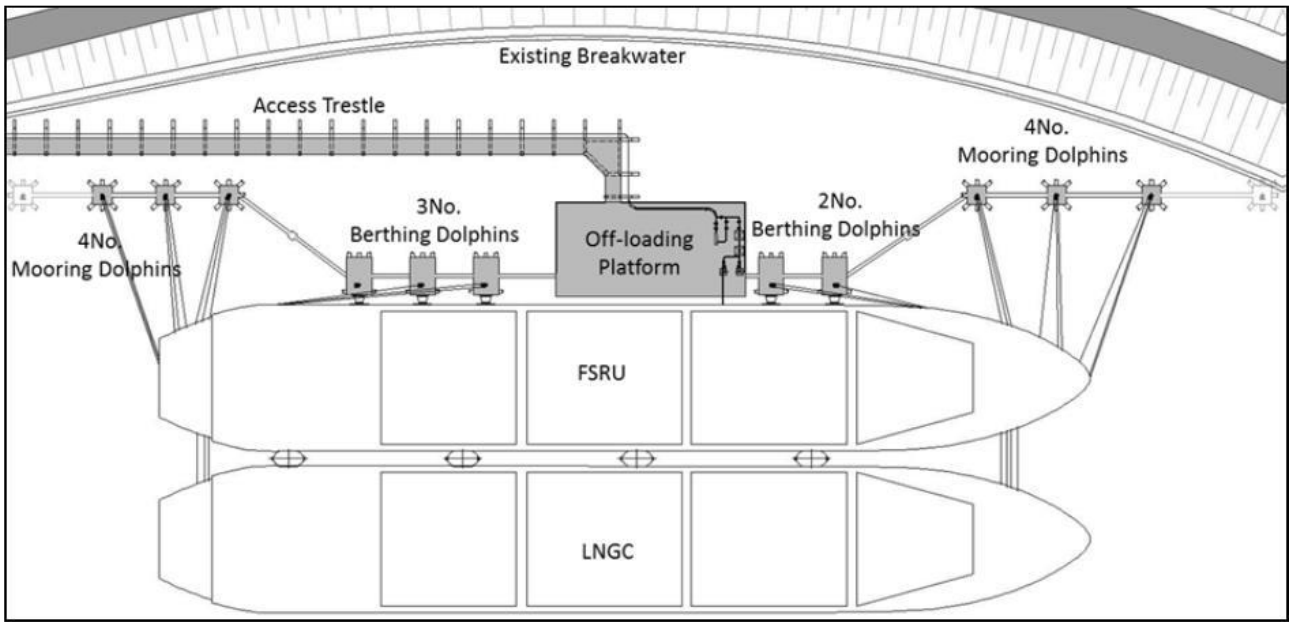


Figure 2-8: Layout 1 –Piled jetty structure (PRDW, 2016)

Typical plant and equipment to be accommodated includes:

- LNG unloading arms
- Vapour return
- Electric power generator
- Power generator (standby)
- Air compressor
- Fire hazard support systems
- Nitrogen system
- Foam system
- HP firewater pump
- Potable water pump
- Potable water tank
- Process and distribution piping
- Drainage and spill containment systems and facilities
- Storage areas for maintenance and safety equipment; and
- Process control and storage buildings required for land-based regasification.

The PRDW study found that Firewater Pump Packages would be required at the Jetty, mounted in dedicated Firewater Pump Rooms designed to be fully self-sufficient in terms of power, control and cooling. The pumps will draw seawater from the harbour.

2.5.2 DREDGING

A dredging assessment (PRDW, 10 June 2016) was compiled based on a review of previous geotechnical surveys, and found that localised dredging is required in order to allow for an adequately sized dredge pocket and to reduce the encroachment of the new berth into the port manoeuvring area.

Two options are available for the disposal of the dredged spoil, namely onshore disposal for reclamation purposes and offshore disposal. Due to uncertainty with regards to the suitability of the material for re-use, offshore disposal has been selected as the preferred method.

A 2001 EIA for the Port of Ngqura identified a preferred site for offshore disposal of dredged spoil for port construction activities. The site is shown in Figure 2-9 and lies approximately 8 km offshore from the Coega River mouth with a depth of 29 to 37 m. It is assumed that any further dredging (and disposal) activities required would fall under this existing authorisation, and that the same methodology and environmental management requirements would apply.

Preliminary calculations of anticipated dredge volumes as presented in Table 2-3 indicate that there is sufficient capacity for the anticipated volume of dredge spoil from terminal excavations to be spoiled at the location depicted in Figure 2-9.

Dredging is expected to involve loading of dredged material directly into a series of sailing hopper barges, which transport the material to the disposal area. Dedicated disposal locations within the site will need to be confirmed, with an attempt to locate a dump site as close as possible to the dredging works. Environmental monitoring of turbidity and water quality would be required at dredging areas and dump sites. It is anticipated that dredging activities will take approximately 22 weeks to complete.

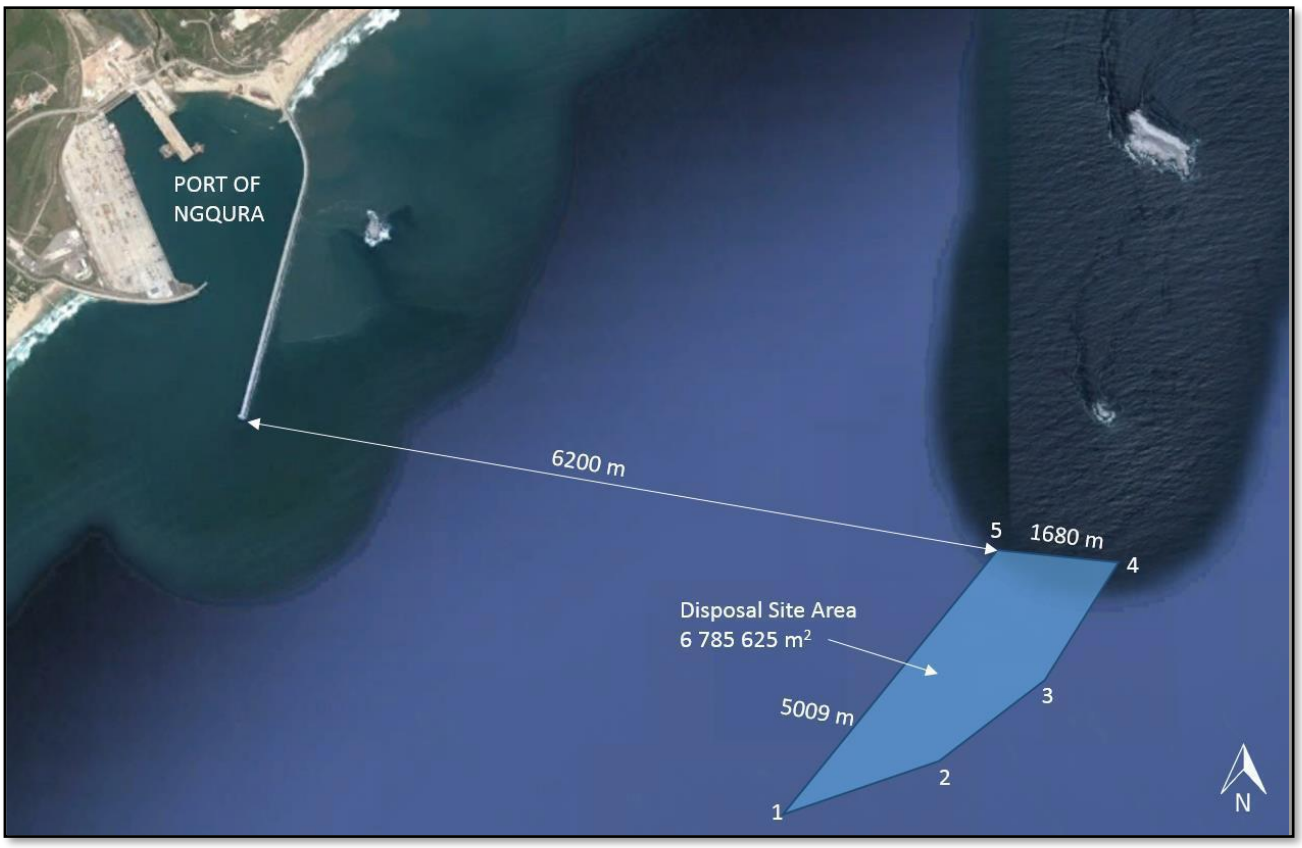


Figure 2-9: Location of proposed offshore disposal site (PRDW, 2016).

Table 2-3: Calculated dredged volumes for the two LNG terminal layouts considered (PRDW, 2016)

Soil type	Layout 1 – Eastern Breakwater dredging volume (m3)	Layout 2 – Dig-out option dredging volume (m3)
Fill material and marine deposits	48,500	67,000
Gravel Lag Deposits (Cobbles and Gravels)	16,200	67,000
Soft Rock (Mudstone: 0 to 12.5 MPa)	-	903,000
Medium to Hard Rock (Mudstone: 12.5 to 30 MPa)	3,300	370,000
Hard Rock (Siltstone: 30 to 50 MPa)	-	74,000
TOTAL	68,000	1,480,000

2.5.3 LNG CARRIER (LNGC)

LNG will be delivered to the Port of Ngqura via LNGC vessels. The LNGC would berth alongside the moored FSRU and transfer the LNG across to the FSRU storage tanks.

It is expected that LNG will initially be offloaded via a short cryogenic pipeline from the LNGC to the FSRU. However, once land-based storage is constructed, and the FSRU departs, LNG will then be pumped from the LNGC to onshore storage tanks via cryogenic LNG unloading arms and a cryogenic pipeline. The unloading process takes approximately 12 to 24 hours.

Boil off Gas is expected from the storage and transportation of LNG and measures to contain, capture, re-use and recover BOG are incorporated in the design of the LNGC and cryogenic pipelines. During the unloading of an LNGC, BOG reports back to the LNG tanker's cargo system by a separate vapour return line(s) to ensure that the pressure in both the FSRU or land-based storage tanks and the LNGC storage tanks is maintained within their design operating parameters.

2.5.4 FLOATING STORAGE AND REGASSIFICATION UNIT (FSRU)

The main components of an FSRU include:

- LNG transfer system (offloading system),
- Storage tanks (in ship);
- Boil-Off Gas handling system,
- LNG pumping system,
- Vaporisation equipment, and
- Heat source (in this case seawater)

It is envisaged (Carnegie Energie, 2019) that up to two FSRU's, each with a storage capacity of 170,000 m^3 (i.e. a total storage capacity of 340,000 m^3) would be required for the project, although land-based storage is likely to be implemented before the second FSRU becomes a requirement.

The FSRU, and potentially the second FSRU, will be berthed permanently at the FSRU terminal. The FSRU houses onboard LNG regasification facilities for the re-warming of the liquefied gas back to natural gas at ambient air temperature via vaporisers. Various re-warming options are available, however the most likely option will be the extraction of relatively warm seawater and the subsequent discharge of the cooled seawater once it has heated the LNG. The estimated maximum quantity of seawater needed for heating LNG is at 20,840 m^3/hour; discharged seawater would be 8^o C cooler than the intake water (Carnegie Energie, 2019).

The FSRU will also be required to provide an LNG supply for local truck loading operations (described in Section 3.5.9). Therefore, even though the bulk of the delivery from the FSRU will be via a Natural Gas pipeline, there will be a requirement for a smaller cryogenic pipeline for the FSRU stage of the development. A Liquid LNG Unloading Arm System will be required to provide safe unloading of the liquid LNG from the FSRU for onward conveyance to the LNG Truck Loading Facility. The system will consist of two loading arms, with flow and return lines to enable cooldown and recirculation systems for BOG (Mott Macdonald 2016).

While an FSRU may be economically more viable while the rate of gas consumption is relatively low, it is expected to be more economical to develop land-based storage and regasification once as the demand for Natural Gas increases.

2.5.5 Gas Transmission Pipelines

Two types of gas pipelines are required to transmit both LNG and natural gas from the LNG terminal to the three power plants and the boundary of the Dedisa peaking power plant (if required) and LNG and gas hub in Zone 10. All gas transmission pipelines will be installed underground and will require servitude widths of 20 m for the double cryogenic pipeline (for LNG) and 10 m for the gas pipeline (for natural gas). TNPA's preference for liquid product pipelines to be supported above ground to facilitate leak detection and maintenance is not applicable to gas pipelines, for which the safety benefits of burying the pipeline are decisive.

The pipelines will be approximately 1 km long and will run parallel from the FSRU, supported by a trestle structure running on the inside of the eastern breakwater until it reaches the landward end of the breakwater near the ACB, and subsequently further onshore to a turning / intersection point where they will be routed north and run along the coast to the Zone 10 power plants and LNG and gas hub, as indicated on Figure 2-2 and the layout drawings in APPENDIX B: Layout Drawings. The pipeline route and road access avoid using the breakwater in accordance with the condition of the environmental Record of Decision stating that no infrastructure may be constructed along the eastern breakwater.

A single natural gas pipeline approximately 6 km long will then run in the services corridor from there to the Zone 13 power plant and boundary of the Dedisa power plant site. The diameters of the LNG and gas pipelines are currently unknown. Potential interference between the powerlines and gas pipelines (running parallel to each other in the services corridor) resulting from voltages and currents, will be taken into account in the final pipeline design and protection measures against corrosion and induced voltages, including cathodic protection.

2.5.6 Natural Gas Pipeline

During the period when the FSRU is in operation, a pipeline will transfer natural gas from the Port to the power plants in Zone 10, and/or connect to the 4 km long gas pipeline from Zone 10 to Zone 13. The gas pipelines and associated servitudes will be accommodated within the services corridor depicted on Figure 2-2. It is expected that the pipeline will be extended up to the existing Dedisa peaking power plant, should this plant convert to gas.

The gas pipeline will also feed into the truck loading facility in the LNG and gas hub for third party offtakers.

2.5.7 Cryogenic Pipelines

LNG cryogenic pipelines will initially be installed to distribute LNG to third party offtakers (via the truck distribution centre located in the LNG and gas hub in Zone 10). The pipeline will convey the LNG from the FSRU via the trestle and along the coastline, following the alignment of the gas pipeline, to the proposed LNG & gas hub, and will include a return pipeline (i.e. a double cryogenic pipeline, with a combined servitude of 20 m is proposed).

Further expansion of the proposed LNG terminal development will entail onshore storage and regasification. This will include cryogenic pipelines to feed LNG from the LNG carrier to the land-based storage and regasification terminal located at the LNG and gas hub in Zone 10. The cryogenic pipelines will be routed underground on the landward side of the main breakwater as there is insufficient space between the ACB and breakwater to accommodate the above-ground cryogenic pipelines (Figure 2-1). Following this they will be routed parallel to the coast in a north easterly direction towards the LNG and gas hub and power plants.

2.5.8 LNG AND GAS HUB

The LNG and gas hub will include facilities for land-based LNG storage and regasification, as well as the truck distribution centre (for third party supply of LNG and gas). The hub will occupy a footprint of up to 23.1 ha, and will be fenced, with an access controlled entrance point. Facilities within the storage and regasification area include admin offices, a utility station and control room, maintenance and repairs workshop and store, a cold vent system, metering package and pig launcher. The truck distribution centre will include a weighbridge, control cabin and loading facilities. A conceptual drawing of what the layout of the facility may look like, including an 85 m sterile radius around the cold vent for safety, is provided in Figure 2-10. The hub will be connected to fire water pipelines (running from the LNG terminal in the port), gas and LNG transmission pipelines. Details of key components of the design are provided in Table 2-4.

Table 2-4: Details of key components of the Gas Infrastructure proposed

Item	Description
Gate House	Building used for gatekeeping and for entering and exiting the facility
Road Loading Facility	Facility for transportation of LNG with trucks
Weighbridge	Weighing station for incoming and outgoing trucks
Road Loading Stand	Facility with loading arms for transportation of LNG with trucks
Cold Vent	Cold vent stack
LNG Storage Tanks	Liquid Natural Gas Storage Tanks (2 x 160 000 m3)
Gas Distribution Facility	Facility for transport and distribution of LNG and regasified gas

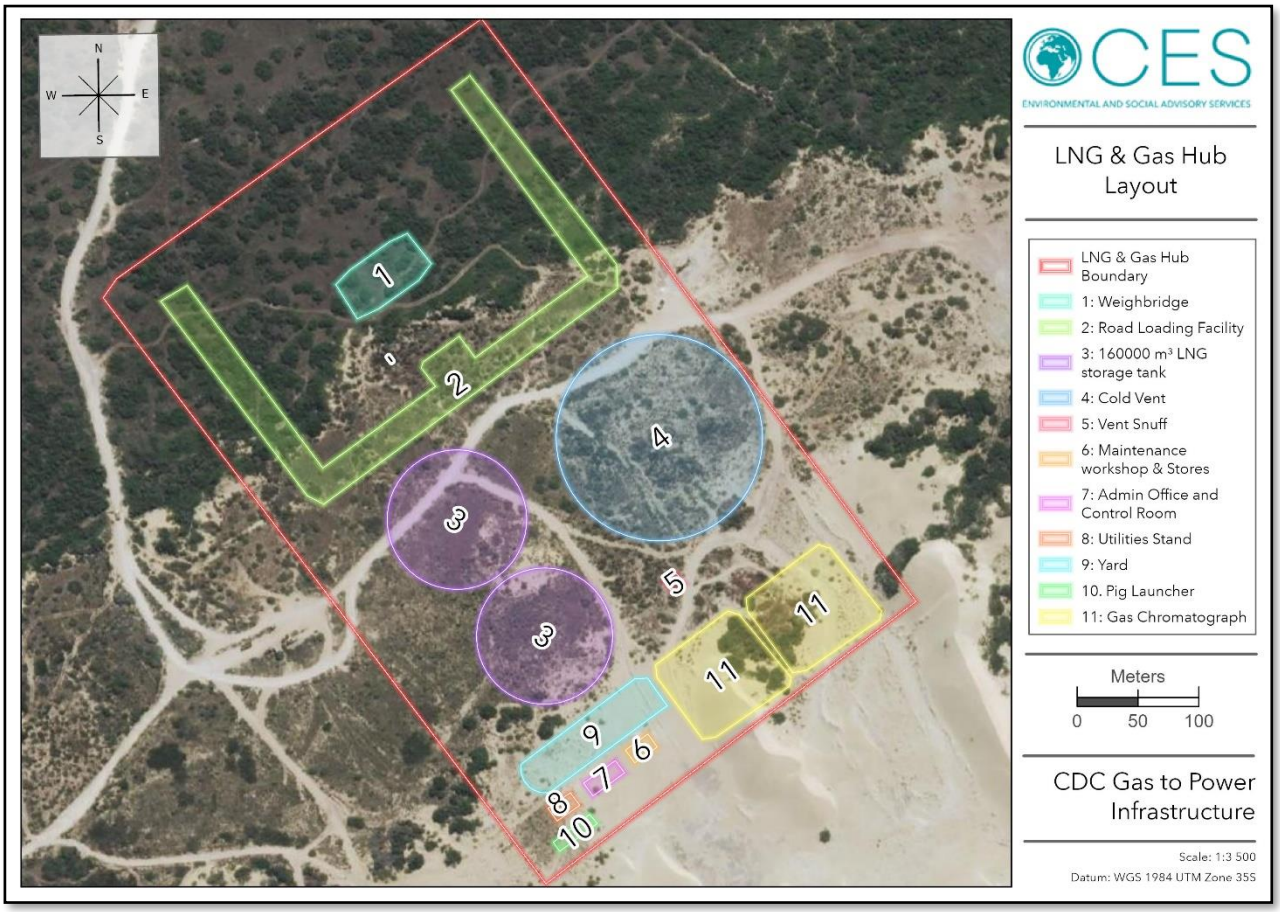


Figure 2-10: LNG and Gas Hub Layout

2.5.9 LNG STORAGE

It is proposed that at a certain point in the expansion of the Gas Infrastructure development, the FSRU will no longer be the most feasible option and land-based storage and regasification will become economically more feasible. The cryogenic pipelines (already constructed) will feed LNG directly from the LNG terminal to a new land-based storage and regasification terminal, at the LNG and gas hub. LNG storage tanks are designed to withstand cold temperatures, maintain the liquid at low temperature, and minimise the amount of evaporation. The BOG is usually captured and recondensed to be sent to the vaporiser with LNG or compressed and sent via the return cryogenic pipeline back to the storage and regasification unit.

It is estimated that up to a maximum of two FSRUs of 170 000 m³ LNG storage capacity each would be required and, should increased capacity beyond this be required, up to two tanks of 160,000 m³ each will be constructed for onshore storage and regasification (i.e. total LNG storage of 320,000 m³ to 340,000 m³) will be required (Carnegie Energie, 2019). No storage of natural gas is proposed.

The LNG storage facility will require a venting system as protection against the risk of overpressure due to "roll-over" in the LNG tank. LNG "rollover" refers to the rapid release of LNG vapours from a storage tank, resulting from stratification.

2.5.10 LNG REGASSIFICATION

The main component in the regasification process is the vaporiser, i.e. heat exchangers used to return the LNG to its regular vapour phase. Due to the proximity of the sea it is expected that the technically preferred vaporisers would be Open Rack Vaporisers (ORV). ORVs take seawater and stream it over the vertical tubes

of the vaporisers in order to warm up the LNG. This is the most common type and generally is the preferred choice where warm seawater is available. The estimated maximum quantity of seawater needed for heating LNG is 20,840 m^3/hour for a typical seawater delta T of 8^o C across the vaporiser. (Carnegie Energie, 2019).

Infrastructure for the intake and discharge of seawater for heating purposes is excluded from the scope of this EIA process and have been addressed in the CDC's Marine Pipeline Servitude EIA.. The seawater abstraction point is anticipated to be within the port and cooling water intake and discharge pipelines are estimated to be 2.5 m in diameter and run underground, parallel to the coast on the seaward side of the gas pipelines, connecting to the Zone 10 power plants and to the LNG and gas hub (for supply of heating water for regasification).

2.5.11 COLD VENT SYSTEM

The regasification and storage facility (both onshore and offshore) will have its own independent overpressure protection and venting systems and fire and gas and depressurisation regimes. The design of the project is expected to be in accordance with a philosophy of minimum venting in order to protect the environment without compromising safety. During normal operation, there will be no flow of vapour from the facilities into the vent system.

Relief and vent streams from the FSRU are expected to be handled by the FSRU. Operational and minor upsets in the LNG Truck Loading Facility are also assumed to return to the FSRU (or onshore regasification unit once this is operational) through the cryogenic recirculation pipeline.

The vent system will need to be sized to handle vapour resulting from depressurisation of the gas pipeline between the jetty and the Emergency Shut Down Valve at the gas distribution facility, and any other coincident relief scenarios.

It is anticipated that there will be a requirement to depressurise the above ground section of the gas pipeline between the FSRU and the underground section of pipeline. It is not anticipated that it will be necessary to blowdown the underground section of gas pipeline.

An emergency Cold Vent system will be required to provide safe release of gas and depressurisation of the gas containing facilities up to the Emergency Shut Down Valve at the Gas Distribution Facility, in the event of an emergency upset or start-up/run-down conditions. The Cold Vent System is expected to terminate in a pipe vent supported by a structural steel stack of a height and location designed to ensure suitable dispersion of the gas. The Cold Vent System is expected to be provided with a Snuffing Package for manual use in the event of ignition.

2.5.12 GAS DISTRIBUTION

The gas exported from the regasification unit will be transported to a gas distribution centre at the LNG and gas hub. The facility will have its own access point with a gate, and will include facilities for gas chromatography as well as pig handling and receiving.

Gas will be regulated at the facility to meet the export gas pressure and flow requirements based on the client's specific purposes. It is envisaged that the distribution facility will serve the power plants and third party users, including a truck loading facility. The gas may also be conditioned to correct for Wobbe Index using LPG and/or Nitrogen.

Each individual customer stream will be regulated to provide customer-specific pressure and flow rate requirements, and to allow metering of the gas. Once the gas passes the custody point, the gas is considered sold, and all facilities downstream of that point would be the responsibility of the customer.

Facilities for online operational pigging are included at each end to allow for pipeline inspection and integrity management. The receiving facilities at the distribution centre include a gas filter to allow any impurities in the pipeline after construction to be removed prior to export to clients. Long term use of the gas filter may not be required, depending on the pipeline and upstream facility cleanliness.

In addition to the above-mentioned items, the gas distribution facilities typically include:

- Emergency shutdown valves to automatically isolate the pipeline on the activation of a shutdown event
- Valves on each customer stream to allow for the isolation of the particular stream for performance of maintenance on any of the equipment
- Control room for local operation of the system
- A cold vent to allow for de-pressurisation of any part of the facility as required in an emergency or during routine maintenance
- Gas conditioning, which typically includes a gas mixing vessel and LPG and / or Nitrogen supply
- Firefighting facilities for emergency response in the event of fire

2.5.13 TRUCK LOADING FACILITY

Truck Loading Facility will be provided within the LNG and gas hub for third party offtake. This will be complete with recirculation systems for BOG and LNG. The Truck Loading Facility will typically comprise a weighbridge and associated loading arms. Initially it is assumed that parallel loading of two road tankers should be provided for. The estimated offtake of LNG is approximately of 787 tpd, providing offtake by 40 x 20 ton LNG trucks per day.

2.5.14 WASTE GENERATION AND MANAGEMENT

During construction, waste types typically associated with large infrastructure will be generated, and disposed of at a landfill site in compliance to the legal requirements. During operation, the following waste streams are expected:

- Used generator and turbine lubricant oil, which will be collected on site and removed in drums by a specialist contractor for appropriate disposal
- Small volumes of oily sludge recovered from on-site surface water treatment

- Spent gas turbine fabric air filter and lube oil filter cartridges
- Dried powder / sludge and spent resins from on-site effluent treatment / demineralisation
- Solid domestic waste (office consumables etc.)
- Scrap metals, plastic and packaging, which will be recycled where possible
- Waste solvents and grease from cleaning of workshop equipment
- Spent laboratory chemicals from water testing and treatment.

Solid waste will be collected and stored on site at the LNG and gas hub in a properly designed facility, prior to regular collection and disposal by a registered contractor. Registration of the storage facility in terms of Category C of the Waste Management Activities may be required, should anticipated storage capacity exceed 100 m^3 of general waste or 80 m^3 of hazardous waste. This will be done post-authorisation once the relevant design details for the waste storage facility are known.

2.5.15 SEWERAGE AND STORMWATER MANAGEMENT

Sewage, effluent and stormwater will be treated on -site to meet the required standards prior to discharge to CDC's bulk services infrastructure. Domestic sewage will need to be pumped to a sewage treatment plant. Depending on timing this would either be the proposed Coega WWTW or the existing Fishwater Flats WWTW. Stormwater treatment on site will include oil and grease traps and separation of clean and dirty stormwater, details of which will be provided in a site specific stormwater management plan.

Stormwater exiting the site will undergo quality monitoring at the discharge point, in addition to CDC's overall stormwater monitoring programme for the SEZ, and will need to comply with the CDC's overall stormwater master plan for the SEZ, which includes attenuation ponds and other bulk stormwater infrastructure.

2.5.16 LABOUR AND EMPLOYMENT

Employment opportunities during construction are estimated to amount to 2030 jobs while it is anticipated that approximately 200 jobs would be created during operation. Thirty percent of these positions (for both construction and operation) would be allocated to local unskilled labourers and 70% by skilled workers. Additional socio-economic benefits resulting from indirect employment (provision of services and goods), stimulation of the local economy, and government levies and taxes paid would also result from the development.

2.6 ENVIRONMENTAL AUTHORISATIONS IN SOUTH AFRICA

The regulation and protection of the environment within South Africa, occurs mainly through the application of various items of legislation, within the regulatory framework of the Constitution (Act No. 108 of 1996).

The primary legislation regulating EIAs within South Africa is the NEMA (Act No. 107 of 1998 and subsequent amendments). The NEMA makes provision for the Minister of Environmental Affairs to identify activities which may not commence prior to authorisation from either the Minister or the provincial Member of the Executive Council ("the MEC"). In addition to this, the NEMA also provides for the formulation of regulations in respect of such authorisations.

The NEMA EIA Regulations (2014 and subsequent 2017 amendments) allow for a Basic Assessment (BA) Process for activities with limited environmental impact (listed in GN R. 983/GN R. 327 & GN R. 985/GN R. 324) and a more rigorous two- tiered approach to activities with potentially greater environmental impact (listed in GN R. 984/GN R. 325). This two-tiered approach includes both a Scoping and EIA Process. The

proposed Coega Gas Infrastructure project activities trigger the need for a Scoping and EIA Process in accordance with the NEMA EIA Regulations (2014 and subsequent 2017 amendments) Listing Notices 1, 2 and 3 and published in Government Notices No. R. 983 (GN R. 327), R. 984 (GN R. 325) and R. 985 (GN R. 324) respectively. The listed activities which are being applied for are provided in Table 2-7 below.

Table 2-7: Listed activities triggered by the proposed Coega Gas to Power Gas Infrastructure Development.

GOVERNMENT NOTICE	ACTIVITY NUMBER	ACTIVITY DESCRIPTION	DESCRIPTION OF PROJECT ACTIVITY THAT TRIGGERS LISTED ACTIVITY
GN R. 327 (EIA Listing Notice 1)	**15**	The development of structures in the coastal public property where the development footprint is bigger than 50 square metres, excluding - (i) the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour;	The cryogenic and natural gas pipelines, firewater as well as the seawater intake pipeline, include footprints exceeding 50 m2 outside the port and within coastal public property.
	17	Development- (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 — (e) infrastructure or structures with a development footprint of 50 square metres or more —	Mooring facilities in the port and infrastructure for intake of seawater and transport of LNG and gas to storage facilities and the power plants are proposed within 100 m of the high water mark of the sea and within the littoral active zone. This includes a new jetty, offloading platform and trestle to support the LNG and gas pipelines within the port, a cryogenic pipeline as well as gas pipelines associated with land-based regasification infrastructure, firewater pipeline and a seawater intake pipeline from the port to the Zone 10 power plants and onshore regasification areas at the LNG and Gas Hub
	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, excluding where - (i) the planting of vegetation or placement of material relates to restoration and maintenance of indigenous coastal vegetation undertaken in accordance with a maintenance management plan; or (ii) such planting of vegetation or placing of material will occur behind a development setback.	LNG and gas pipelines, seawater intake pipeline, and LNG and gas hub will be constructed within the littoral active zone/dunes and will therefore require stabilisation measures, exceeding 10 m2. This may include planting of vegetation as part of rehabilitation of the site during construction. The CDC's Standard Vegetation Specification for Construction (dated 2005) will be adhered to, however specific measures to address revegetation of coastal vegetation will be required.
	19A	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- (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the	Excavations, infilling or deposition (in excess of 5 m^3) will be required for the proposed pipelines and infrastructure within Zone 8 and 10 of the Coega SEZ, including a new jetty and trestle structure within the port. This will take place within 100 m inland of the high water mark and within the littoral active zone. Dredging within the port for construction of the jetty and mooring platform will be required,

GOVERNMENT NOTICE	ACTIVITY NUMBER	ACTIVITY DESCRIPTION	DESCRIPTION OF PROJECT ACTIVITY THAT TRIGGERS LISTED ACTIVITY
		sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing, dredging, excavation, removal or moving- (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies	however it is understood that this activity has already been authorised under the existing RoD for the port and therefore is not specifically applied for.
	27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The LNG & gas hub will require the clearing of vegetation. It is anticipated that this will be up to approximately 181,000 m2. The equivalent/similar activity is authorised in the 2007 Rezoning EA for the SEZ, and therefore clearing of vegetation will not be applied for or assessed in this EIA.
GN R. 325 (EIA Listing Notice 2)	4	The development of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.	The proposed Gas Infrastructure includes both on & off-shore infrastructure for storage of up to approximately 340,000 m³ of LNG, and other dangerous goods such as chemicals and fuels.
	6	The development of facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent	The development of the Gas Infrastructure will require licences, including an Atmospheric Emission Licence in terms of NEM:AQA (Act 39 of 2004) for the storage of fuel and potentially a coastal waters discharge permit may also be required for the discharge of heating water required for regasification
	7	The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods– (i) in gas form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity of more than 700 tons per day; (ii) in liquid form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity of more than 50 cubic metres p-er day	All proposed infrastructure for the conveyance of LNG and Natural Gas falls within the Coega SEZ and the Port of Ngqura, and will be in pipelines exceeding 1 km in length, with throughput capacities exceeding the thresholds specified. In the event that either of these activities are deemed to occur outside of an industrial complex, then this activity would be triggered.
	14	The development and related operation of- (ii) an anchored platform; or (iii) any other	The development of an LNG terminal for the FSRU will require the construction of a jetty and mooring structures, as well as a trestle running inside the

GOVERNMENT NOTICE	ACTIVITY NUMBER	ACTIVITY DESCRIPTION	DESCRIPTION OF PROJECT ACTIVITY THAT TRIGGERS LISTED ACTIVITY
		structure or infrastructure on, below or along the sea bed;	harbour breakwater to support the gas and LNG pipelines. All of these will require the construction of piling or other structures into the sea bed for support.

The Applicant, or the EAP on behalf of the Applicant, is initially required to submit a report detailing the Scoping Phase (Scoping Report – completed) and set out the ToR for the EIA Process (Plan of Study for EIA). This is then followed by a report detailing the EIA Phase, the Environmental Impact Report (EIR). The Competent Authority will issue a final decision subsequent to their review of the Final EIR.

The Competent Authority that must consider and decide on the application for authorisation in respect of the activities, listed in Table 2-7 above, is the National Department Forestry, Fisheries and the Environment (DFFE) as the Department has reached an agreement with all Provinces that all electricity-related projects, including generation, transmission and distribution, are to be submitted to the National DFFE, irrespective of the legal status of the Applicant. This decision has been made in terms of Section 24(C)(3) of the NEMA (Act No. 107 of 1998 and subsequent amendments).

In addition to the requirements for an Environmental Authorisation (EA) in terms of the NEMA, there may be additional legislative requirements that need to be considered prior to commencing with the activity, these include but are not limited to:

- National Heritage Resources Act (Act No. 25 of 1999);
- National Water Act (Act No. 36 of 1998);
- Civil Aviation Act (Act No. 74 of 1962) as amended;
- National Environmental Management Biodiversity Act (Act No. 10 of 2004);
- National Forests Act (Act No. 84 of 1998); and the
- Eastern Cape Nature and Environmental Conservation Ordinance (No. 19 of 1974).

These are discussed in detail in Chapter 4 of this report.

3 PROJECT NEED AND DESIRABILITY

South Africa has recognised the need to expand electricity generation capacity within the country. This is based on national policy and informed by ongoing planning undertaken by the Department of Mineral Resources and Energy (DMRE) and the National Energy Regulator of South Africa (NERSA).

The South African Integrated Resource Plan (IRP 2019) was released during 2019, setting out a new direction in energy sector planning. The plan included a shift away from coal, and an increased adoption of renewables and gas.,. The revised plan marks a major shift in energy policy. The draft policy aimed to decommission a total of 35 GW (of 42 GW currently operating) of coal generation capacity from Eskom by 2050, starting with 12 GW by 2030, 16 GW by 2040 and a further 7 GW by 2050. IRP2019 identifies specific interventions to address electricity infrastructure development, based on least-cost electricity supply and demand balance, taking into account security of supply and protection of the environment, while it spells out the preferred generation technologies required to meet expected demand growth up to 2030. A key electricity policy position will be implemented in line with IRP2019, is the Policy Position 7 which indicates that South Africa should support the development of gas infrastructure. The IRP further calls for 3,000 MW of electricity to be procured to be generated from gas by 2027. A ministerial determination for this procurement has been issued and NERSA has concurred.

The implementation of the IRP constitutes significant progress in the transformation of the South African energy sector.

3.1 Electricity Supply in South Africa

South Africa's current electricity generation and supply system is unreliable. The Eastern Cape Province is reliant on the import of power from other provinces, and hence constrained by the availability and stability of electricity supply.

Currently, Eskom has a net output of 47,201MW, and it produces 85% of South Africa's electricity, which is an equivalent of 40% of Africa's electricity. Renewable energy accounts for 5% of South Africa's electricity. This is mainly due to the targets set in the IRP that aimed to change the electricity landscape from high coal (91.7%) to medium coal (48%) using electricity produced by the Independent Power Producers, with the utility company, Eskom, as the single buyer of the electricity.

South Africa is currently experiencing a severe electricity supply constraint and the country has declared a national state of disaster on the 9th of February 2023, to mitigate the impact of sever electricity supply constraint. A call has been made to organs of state to further strengthen and support existing structure established to coordinate and manage the implementation of contingency arrangement in line with the National Energy Plan.

3.2 Social and Economic Development

The proposed Gas to Power infrastructure will create employment opportunities during the construction and operation phases and provide the necessary infrastructure for the provision power to the national energy grid during the operation phase, improving energy security at a national level and indirectly facilitating further development opportunities in the area. The project would therefore constitute a strategic investment that will generate benefits through the provision of power, in a more environmentally sustainable manner than coal fired power generation. The project will also potentially allow for increased power supply from renewable energy sources over the longer term, thereby mitigating intermittency of supply to facilitate a more assured, dispatchable power supply.

The economic need and desirability of a project can be assessed using national, provincial, district and local municipal planning documents to assess the project's economic compatibility with plans. These documents describe specific economic objectives and emphasise the need to:

- Improve job creation opportunities
- Ensure appropriate economic growth
- Concentrate on sustainable job creation, using existing economic strategies as a basis, particularly business and infrastructure development
- Encourage trade and investment through improved energy availability and security
- Provide adequate and appropriate infrastructure to stimulate economic growth

The proposed project is aligned with the above objectives, which effectively support the development of the Gas to Power infrastructure as a means to ensure economic growth and energy provision.

It is essential that the implementation of social and economic policies takes cognisance of strategic ecological concerns such as climate change, food security, as well as the sustainability in supply of natural resources and the status of our ecosystem services. Sustainable development is the process that is followed to achieve the goal of sustainability (DEA, 2014).

Sustainable development implies that a project should not compromise natural systems. In this regard, the Best Practicable Environmental Option (BPEO) is that which provides the most benefit and causes the least

damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.

NEMA and the EIA Regulations, 2014 call for a hierarchical approach to the selection of development options, as well as impact management which includes the investigation of alternatives to avoid, reduce (mitigate and manage) and/or remediate (rehabilitate and restore) negative (ecological) impacts (DEA, 2014).

In support of this, the applicant's motivation for the project is presented in Table 2-1. In essence, the gas infrastructure is needed to address current and projected energy shortfall at a national level, as well as stimulate local employment and the economy.

Gas fired power generation is among the current alternative sources of energy which has been shown to be an efficient and, in comparison with coal fired power plants, a relatively clean method of thermal power generation.

3.3 INTERNATIONAL

3.3.1 THE 1992 UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

The UNFCCC is a framework convention which was adopted at the 1992 Rio Earth Summit. South Africa signed the UNFCCC in 1993 and ratified it in August 1997. The stated purpose of the UNFCCC is to, "achieve… stabilisation of greenhouse gas concentrations in the atmosphere at concentrations at a level that would prevent dangerous anthropogenic interference with the climate system", and to thereby prevent human-induced climate change by reducing the production of greenhouse gases defined as, "those gaseous constituents of the atmosphere both natural and anthropogenic, that absorb and re-emit infrared radiation".

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The UNFCCC is relevant in that the proposed Coega Gas Infrastructure project will contribute to a reduction in the production of greenhouse gases by providing an alternative to coal-derived electricity. South Africa has committed to reducing emissions to demonstrate its commitment to meeting international obligations.

3.3.2 THE KYOTO PROTOCOL (2002)

The Kyoto Protocol is a protocol to the UNFCCC which was initially adopted for use on the 11th of December 1997 in Kyoto, Japan, and which entered into force on the 16th of February 2005 (UNFCCC, 2009). The Kyoto Protocol is the chief instrument for tackling climate change. The major feature of the Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions. This amounts to an average of 5% against 1990 levels over the five-year period 2008-2011. The major distinction between the Protocol and the Convention is that, "while the Convention encouraged industrialised countries to stabilize GHG emissions, the Protocol commits them to do so".

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The Kyoto Protocol is relevant in that the proposed Coega Gas Infrastructure project will contribute to a reduction in the production of greenhouse gases by providing an alternative to coal-derived electricity and will assist South Africa to begin demonstrating its commitment to meeting international obligations in terms of reducing its emissions.

3.4 NATIONAL

3.4.1 NATIONAL DEVELOPMENT PLAN (2011)

The National Development Plan (NDP) (also referred to as Vision 2030) is a detailed plan produced by the National Planning Commission in 2011 that is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP represents a new approach by Government to promote sustainable and inclusive development in South Africa, promoting a decent standard of living for all, and includes twelve (12) key focus areas, those relevant to the current proposed Gas Infrastructure development being:

- An economy that will create more jobs;
- Improving infrastructure; and
- Transition to a low carbon economy.

SECTOR	TARGET
Electrical infrastructure	➢ South Africa needs an additional 29,000 MW of electricity by 2030. About 10,900 MW of existing capacity will be retired, implying new build of about 40,000 MW. ➢ A transition from 2.6% to 15.7% of the national energy mix from fossil fuels to natural gas by 2030.
Transition to a low carbon economy	➢ Achieve the peak, plateau and decline greenhouse gas emissions trajectory by 2025.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The proposed Coega Gas Infrastructure will contribute towards additional energy capacity in South Africa and will contribute towards the transition to a low-carbon economy.

3.4.2 NATIONAL CLIMATE CHANGE RESPONSE WHITE PAPER (2012)

The White Paper indicates that Government regards climate change as one of the greatest threats to sustainable development in South Africa and commits the country to making a fair contribution to the global effort to achieve the stabilisation of greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system.

The White Paper also identifies various strategies in order to achieve its climate change response objectives, including:

- The prioritisation of mitigation interventions that significantly contribute to an eventual decline emission trajectory from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors; and
- The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.

The White Paper provides numerous specific actions for various Key Mitigation Sectors including renewable energy. The following selected strategies (amongst others) must be implemented by South Africa in order to achieve its climate change response objectives:

- The prioritisation of mitigation interventions that significantly contribute to a peak, plateau and decline emission trajectory where greenhouse gas emissions peak in 2020 to 2025 at 34% and 42% respectively below a business as usual baseline, plateau to 2035 and begin declining in absolute terms from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors; and
- The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The proposed Coega Gas Infrastructure project will provide an alternative to coal-derived electricity and will contribute to climate change mitigation.

3.4.3 INTEGRATED ENERGY PLAN FOR THE REPUBLIC OF SOUTH AFRICA (2003)

The former Department of Minerals and Energy (DME) commissioned the Integrated Energy Plan (IEP) in response to the requirements of the National Energy Policy in order to provide a framework by which specific energy policies, development decisions and energy supply trade-offs could be made on a project-by-project basis. The framework is intended to create a balance between energy demand and resource availability so as to provide low cost electricity for social and economic development, while taking into account health, safety and environmental parameters.

In addition to the above, the IEP recognised the following: -

- South Africa is likely to be reliant on coal for at least the next 20 years as the predominant source of energy;
- New electricity generation will remain predominantly coal based but with the potential for hydro, natural gas, renewables and nuclear capacity;
- Need to diversify energy supply through increased use of natural gas and new and renewable energies;
- The promotion of the use of energy efficiency management and technologies;
- The need to ensure environmental considerations in energy supply, transformation and end use;
- The promotion of universal access to clean and affordable energy, with the emphasis on household energy supply being coordinated with provincial and local integrated development programme;
- The need to introduce policy, legislation and regulations for the promotion of renewable energy and energy efficiency measures and mandatory provision of energy data; and
- The need to undertake integrated energy planning on an on-going basis.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The Coega Gas Infrastructure is in line with the IEP with regards to diversification of energy supply and the promotion of universal access to clean energy.

3.4.4 INTEGRATED RESOURCE PLAN FOR ELECTRICITY 2010-2030 (REVISION 3, 2019)

The Integrated Resource Plan (IRP, 2019) for South Africa was initiated by the DoE and lays the foundation for the country's energy mix up to 2030, and seeks to find an appropriate balance between the expectations of different stakeholders considering a number of key constraints and risks, including:

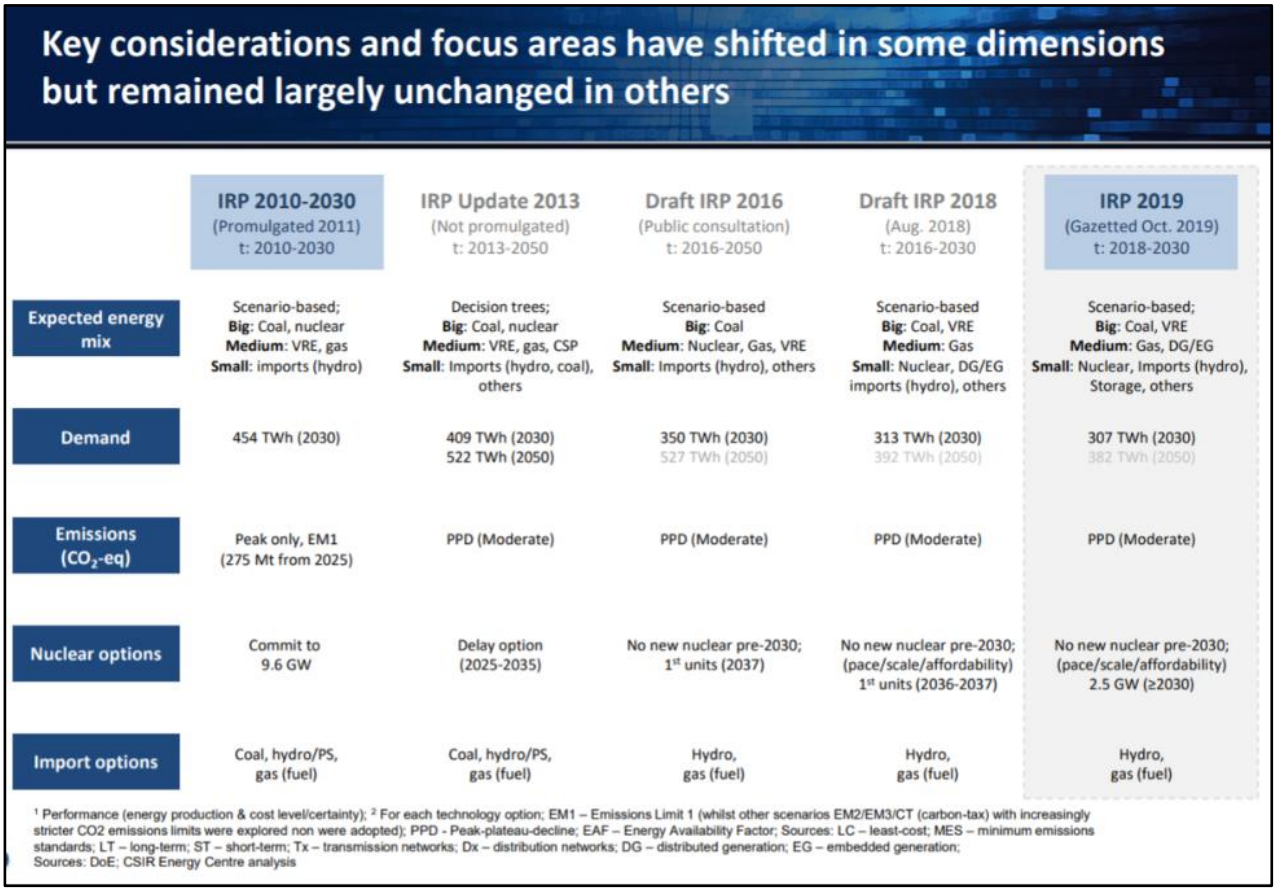
- Reducing carbon emissions;
- New technology uncertainties such as costs, operability and lead time to build;
- Water usage;
- Localisation and job creation;
- Southern African regional development and integration; and
- Security of supply.

The Integrated Resource Plan is an electricity infrastructure development plan based on the least-cost electricity supply and demand balance, taking into account security of supply and the environment through the minimisation of negative emission and water use. It is important because it is South Africa's plan for the procurement of generation capacity up to 2030. The last such plan was the Integrated Resource Plan 2010 (IRP 2010) promulgated in March 2011, and more recently updated in 2019..

Since the promulgation of IRP 2010, a total of 18 000 MW of new generation capacity has been committed comprising 9,564 MW of coal power at Medupi and Kusile, 1,332 MW of water pumped storage at Ingula, 6,422 MW of renewable energy by independent power producers (IPPs), and 1,005 MW of Open Cycle Gas Turbine (OCGT) peaking plants currently using diesel at Avon and Dedisa.

6,000 MW of new solar PV capacity and 14,400 MW of new wind power capacity will be commissioned by 2030 under IRP 2019. The current annual build limits on solar PV and wind have been retained pending a report on the just transition strategy. There will be no new concentrated solar power commissioned under IRP 2019 up to 2030 beyond the 300 MW already committed to being commissioned in 2019.

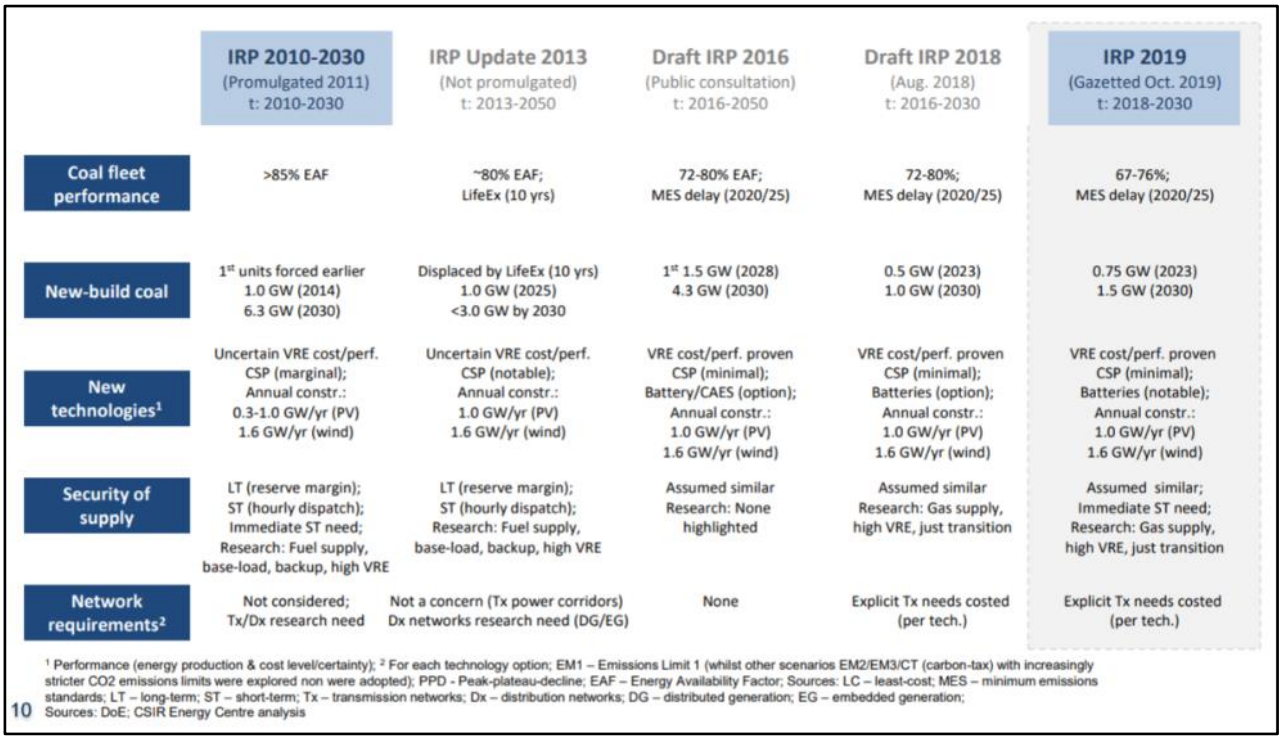
The following image outlines the steps taken between the last IRP Revision (2011) and the latest IRP Revision (2019). As per the CSIR summary (Online: https://researchspace.csir.co.za/)



Key considerations and focus areas have shifted in some dimensions but remained largely unchanged in others

	IRP 2010-2030 (Promulgated 2011) t: 2010-2030	IRP Update 2013 (Not promulgated) t: 2013-2050	Draft IRP 2016 (Public consultation) t: 2016-2050	Draft IRP 2018 (Aug. 2018) t: 2016-2030	IRP 2019 (Gazetted Oct. 2019) t: 2018-2030
Expected energy mix	Scenario-based; **Big**: Coal, nuclear **Medium**: VRE, gas **Small**: imports (hydro)	Decision trees; **Big**: Coal, nuclear **Medium**: VRE, gas, CSP **Small**: Imports (hydro, coal), others	Scenario-based **Big**: Coal **Medium**: Nuclear, Gas, VRE **Small**: Imports (hydro), others	Scenario-based **Big**: Coal, VRE **Medium**: Gas **Small**: Nuclear, DG/EG imports (hydro), others	Scenario-based; **Big**: Coal, VRE **Medium**: Gas, DG/EG **Small**: Nuclear, Imports (hydro), Storage, others
Demand	454 TWh (2030)	409 TWh (2030) 522 TWh (2050)	350 TWh (2030) 527 TWh (2050)	313 TWh (2030) 392 TWh (2050)	307 TWh (2030) 382 TWh (2050)
Emissions (CO_2-eq)	Peak only, EM1 (275 Mt from 2025)	PPD (Moderate)	PPD (Moderate)	PPD (Moderate)	PPD (Moderate)
Nuclear options	Commit to 9.6 GW	Delay option (2025-2035)	No new nuclear pre-2030; 1st units (2037)	No new nuclear pre-2030; (pace/scale/affordability) 1st units (2036-2037)	No new nuclear pre-2030; (pace/scale/affordability) 2.5 GW (≥2030)
Import options	Coal, hydro/PS, gas (fuel)	Coal, hydro/PS, gas (fuel)	Hydro, gas (fuel)	Hydro, gas (fuel)	Hydro, gas (fuel)

[1] Performance (energy production & cost level/certainty); [2] For each technology option; EM1 – Emissions Limit 1 (whilst other scenarios EM2/EM3/CT (carbon-tax) with increasingly stricter CO2 emissions limits were explored non were adopted); PPD - Peak-plateau-decline; EAF – Energy Availability Factor; Sources: LC – least-cost; MES – minimum emissions standards; LT – long-term; ST – short-term; Tx – transmission networks; Dx – distribution networks; DG – distributed generation; EG – embedded generation; Sources: DoE; CSIR Energy Centre analysis



	IRP 2010-2030 (Promulgated 2011) t: 2010-2030	IRP Update 2013 (Not promulgated) t: 2013-2050	Draft IRP 2016 (Public consultation) t: 2016-2050	Draft IRP 2018 (Aug. 2018) t: 2016-2030	IRP 2019 (Gazetted Oct. 2019) t: 2018-2030
Coal fleet performance	>85% EAF	~80% EAF; LifeEx (10 yrs)	72-80% EAF; MES delay (2020/25)	72-80%; MES delay (2020/25)	67-76%; MES delay (2020/25)
New-build coal	1st units forced earlier 1.0 GW (2014) 6.3 GW (2030)	Displaced by LifeEx (10 yrs) 1.0 GW (2025) <3.0 GW by 2030	1st 1.5 GW (2028) 4.3 GW (2030)	0.5 GW (2023) 1.0 GW (2030)	0.75 GW (2023) 1.5 GW (2030)
New technologies[1]	Uncertain VRE cost/perf. CSP (marginal); Annual constr.: 0.3-1.0 GW/yr (PV) 1.6 GW/yr (wind)	Uncertain VRE cost/perf. CSP (notable); Annual constr.: 1.0 GW/yr (PV) 1.6 GW/yr (wind)	VRE cost/perf. proven CSP (minimal); Battery/CAES (option); Annual constr.: 1.0 GW/yr (PV) 1.6 GW/yr (wind)	VRE cost/perf. proven CSP (minimal); Batteries (option); Annual constr.: 1.0 GW/yr (PV) 1.6 GW/yr (wind)	VRE cost/perf. proven CSP (minimal); Batteries (notable); Annual constr.: 1.0 GW/yr (PV) 1.6 GW/yr (wind)
Security of supply	LT (reserve margin); ST (hourly dispatch); Immediate ST need; Research: Fuel supply, base-load, backup, high VRE	LT (reserve margin); ST (hourly dispatch); Research: Fuel supply, base-load, backup, high VRE	Assumed similar Research: None highlighted	Assumed similar Research: Gas supply, high VRE, just transition	Assumed similar; Immediate ST need; Research: Gas supply, high VRE, just transition
Network requirements[2]	Not considered; Tx/Dx research need	Not a concern (Tx power corridors) Dx networks research need (DG/EG)	None	Explicit Tx needs costed (per tech.)	Explicit Tx needs costed (per tech.)

[1] Performance (energy production & cost level/certainty); [2] For each technology option; EM1 – Emissions Limit 1 (whilst other scenarios EM2/EM3/CT (carbon-tax) with increasingly stricter CO2 emissions limits were explored non were adopted); PPD - Peak-plateau-decline; EAF – Energy Availability Factor; Sources: LC – least-cost; MES – minimum emissions standards; LT – long-term; ST – short-term; Tx – transmission networks; Dx – distribution networks; DG – distributed generation; EG – embedded generation;
10 Sources: DoE; CSIR Energy Centre analysis

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The proposed Coega Gas Infrastructure is in line with the draft IRP 2019 with respect to the energy mix and movement to a low carbon economy up to 2030 and beyond as well as the aim to transition natural gas from 2.6% to 15.7% of the national energy mix by 2030.

3.4.5 Long Term Mitigation Scenarios (2007)

The aim of the Long-Term Mitigation Scenarios (LTMS) was to set the pathway for South Africa's long-term climate policy and will eventually inform a legislative, regulatory and fiscal package that will give effect to the policy package at a mandatory level. The overall goal is to "develop a plan of action which is economically risk-averse and internationally aligned to the world effort on climate change."

The strategy assesses various response scenarios but concludes that the only sustainable option ("the preferred option") for South Africa is the "Required by Science" scenario where the emissions reduction targets should target a band of between -30% to -40% emission reductions from 2003 levels by 2050 which includes increasing renewable energy in the energy mix by 50% by 2050.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The proposed Coega Gas Infrastructure will contribute towards an overall reduction in emissions and aligns with the world stance on efforts towards the mitigation of climate change.

3.4.6 Industrial Policy Action Plan 2011/12 – 2013/14

The South African Industrial Policy Action Plan (IPAP 2) 2011/12 – 2013/14 represents a further step in the evolution of this work and serves as an integral component of government's New Growth Path and notes that there are significant opportunities to develop new 'green' and energy-efficient industries and related services; and indicates that in 2007/2008, the global market value of the 'Low-Carbon Green Sector' was estimated at £3 trillion (or nearly US$5 trillion), a figure that is expected to rise significantly in the light of climate-change imperatives, energy and water security imperatives.

Based on economic, social and ecological criteria, IPAP identified a number of sub-sectors and an initial round of concrete measures were proposed for development of the renewable energy sector with the following key action programmes:

- Solar and Wind Energy - Stimulate demand to create significant investment in renewable energy supply and the manufacturing of local content for this supply.
- Green Industries special focus: The South African Renewables Initiative (SARi) - SARi is an intra-governmental initiative set to catalyse industrial and economic benefits from an ambitious program of renewables development; including financing and associated institutional arrangements that would not impose an unacceptable burden on South Africa's economy, public finances or citizens.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The proposed Coega Gas Infrastructure will contribute towards an overall reduction in emissions and it aligns with the world stance on efforts towards the mitigation of climate change.

3.5 PROVINCIAL

3.5.1 EASTERN CAPE PROVINCIAL DEVELOPMENT PLAN (2014)

The Eastern Cape Provincial Development Plan 2014 (Eastern Cape Vision 2030) is a strategic policy which has been designed to identify strategic goals for implementation in the province. There are five goals, one of which will be expanded in detail as it relates to the growth of the economy, from a renewable energy and ecotourism perspective. The Sarah Baartman (was Cacadu) District is earmarked for the development of both renewable energy (specifically wind) and ecotourism (private, national and provincial). This makes the region particularly difficult to navigate in terms of need and desirability.

As per the EC PDP the following goals encompass the 2030 vision.

1. Goal 1: A growing, inclusive and equitable economy – "The Eastern Cape has a growing, inclusive and equitable economy, which is larger and more efficient, and optimally exploits the competitive advantages of the province, increases employment, and reduces inequalities of income and wealth. This vision will be realised addressing the key constraints to unlocking economic potential: production costs, economic development support, infrastructure, workforce issues, and land and water challenges."
   The focus will be on seven high-potential sectors:
   i. Agriculture
   ii. Mining and energy
   iii. Construction related to large infrastructure, new property developments and the upgrading of human settlements.
   iv. Manufacturing
   v. Tourism, including eco-tourism, heritage, conferences and sports.
   vi. The social economy, including public works and asset-based community development.
   vii. Knowledge-based services, including R&D, professional services and business services
   The economic goal will be achieved through five strategic objectives:
   i. Improved economic infrastructure that promotes new economic activity
   ii. Stronger industry and enterprise support
   iii. An accelerated and completed land-reform process
   iv. Rapid development of high-potential economic sectors
   v. Rapid economic development of rural areas and all regions.
2. Goal 2: An educated, empowered and innovative citizenry
3. Goal 3: A healthy population
4. Goal 4: Vibrant, equitably enabled communities
5. Goal 5: Capable, conscientious and accountable institutions

The following strategic objectives form part of the EC PDP 2030 Vision. These strategic objectives have been copied verbatim from the PDP. All those which are relevant to the proposed development area have been highlighted and discussed. Those which are not relevant are not expanded on.

1. Strategic objective 1.1: Improved economic infrastructure that promotes new economic activity

Strategic action 1.1.1: Develop stronger provincial infrastructure planning capacities

Infrastructure planning is a complex process, involving large long-term investments, projected benefits that are difficult to quantify, and a combination of engineering and economic thinking. While the theory of allocating available capital among alternative infrastructure projects is straightforward (select projects with the highest socioeconomic return on investment using a standardised methodology), the practice is much more difficult. The province needs to build infrastructure planning capacity to ensure the following:

- *New infrastructure investments are aligned with the provincial development agenda.*
- *New investments optimise potential economic benefits, encouraging new private-sector investment, increasing local content supply and creating local jobs.*
- *New investments are responsive to changing economic circumstances.*
- *Investments contribute to equitable development – all regions of the province must benefit from the infrastructure programme (see strategic objective 5 for more on this point).*
- *Infrastructure planning and delivery by state-owned entities and others around water, energy, logistics and ICT need to be integrated because different types of infrastructure are usually required jointly.*
- *More capacitated infrastructure planning is required to present convincing arguments to potential investors and to enable effective lobbying.*

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The proposed Coega Gas Infrastructure comprises new infrastructure investment for the Eastern Cape province and includes potential economic benefits such as encouraging new private-sector investment, increasing local content supply and creating local jobs.

Strategic action 1.1.2: Work with the Presidential Infrastructure Coordinating Committee to plan and implement improved infrastructure

The Presidential Infrastructure Coordinating Committee has done considerable work on the National Infrastructure Plan. A summary of this plan in the province is presented in Annexure E.

We support much of what the Presidential Infrastructure Coordinating Committee is planning for the province. Large elements of the plan in the Eastern Cape are unfunded and preliminary; therefore the province will work with the Presidential Infrastructure Coordinating Committee to ensure that the National Infrastructure Plan responds fully to development priorities.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The proposed Coega Gas Infrastructure is in line with the National Infrastructure Plan which aims to improve energy supply across the whole of South Africa. One of the regions earmarked for wind development is the Sarah Baartman district of the Eastern Cape province.

Strategic action 1.1.4: A major new provincial irrigation programme

This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.1.5: Investment in strategic freight and passenger corridors

This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.1.6: Position the province as a key investment hub in the energy sector and ensure reliable energy supply to high-potential sectors.

The province is positioning itself as an investment hub in the energy sector (wind farms, imported liquefied natural gas, shale-gas and nuclear energy). This will provide opportunities to develop the capital goods sector and heavy industries. This new investment could become a major catalyst for provincial economic development, particularly if the benefits and costs are well managed. Regional and local benefits accruing from new investment in the energy sector could include:

- *Cheaper energy (fuel and electricity), leading to cheaper food and transport, and more competitive labour markets.*

- *Employment in the construction, operation and maintenance of new energy facilities.*
- *Employment in the supply of manufactured components for the new energy facilities.*
- *Downstream linkages (for example, in the petro-chemicals industry based on shale gas).*
- *New rental collection systems to capture a portion of the surplus from these new investments.*

The province will need to position itself very carefully to ensure that these regional and local benefits are maximised, and costs (including externalities) are minimised.

In addition, municipalities need to improve their maintenance and upgrading of electricity distribution, and review their mark-ups on electricity prices. This work should be spearheaded by the Department of Economic Development, Environmental Affairs and Tourism.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The proposed Coega Gas Infrastructure is in line with the Eastern Cape Vision 2030 Provincial Development Plan, specifically Strategic Action 1.1.6, as it entails the development of infrastructure required for the supply of natural gas and ultimately the provision of electricity for anticipated increases in energy demands as the Coega SEZ expands and international and local developers invest in the Coega SEZ for industrial and manufacturing projects.

Based on the proposed Albany Biodiversity Corridor Network which has been put forward by Indalo PE, ECPTA and SANParks, the proposed Coega Gas Infrastructure does not impede on this corridor network.

Strategic action 1.1.7: Universal and affordable broadband access
This strategic action would not be impeded by the proposed Gas Infrastructure.

2. Strategic objective 1.3: Stronger industry and enterprise support

Strategic action 1.3.1: Create partnerships to drive economic development
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.3.2: Improve use of public resources for industry and enterprise support
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.3.3: Increase public resources for industry and enterprise support
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.3.4: Support micro, small, medium and large-scale enterprises
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.3.5: Ensure supply of skills to growth sectors
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.3.6: Support R&D and innovation initiatives
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.3.7: Develop new policy instruments
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.3.8: Improve capacity for economic policy analysis
This strategic action would not be impeded by the proposed Gas Infrastructure.

4. Strategic objective 1.4: Accelerate and complete the land-reform process

Strategic action 1.4.1: Design, implement and complete a new land redistribution plan
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.4.2: Address communal land tenure reform
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.4.3: Finalise restitution process
This strategic action would not be impeded by the proposed Gas Infrastructure.

5. Strategic objective 1.5: Rapid development of high-potential economic sectors
The PDP's diagnostic process identified seven economic sectors with strong development potential. The table below summarises the suggested high-level sector strategies:

SECTOR	SUGGESTED STRATEGIES
Agriculture	*Address land ownership and water issues to enable rapid capital accumulation (multi-scale and complete value chains). Focus on irrigation opportunities and value addition.*
Mining and Energy	*Optimise benefits from Karoo shale-gas, including feedstock for provincial petrochemicals, and position the Province as an energy hub*
Construction	*Ensure present infrastructure pipeline is properly planned, resourced and implemented; create enabling conditions for property development and build skills base.*
Manufacturing	*Exploit coastal competitive advantages and realise potential of industrial development zones/special economic zones; create multi-agency partnerships to drive industrial expansion and diversification*
Tourism	*Use competitive advantages to grow volume and value of eco-tourism, heritage and sports tourism; improve access infrastructure and build stronger local tourism networks*
Social Economy	*Transform public works (EPWP/CWP) into a major platform for sustainable enterprise development (asset-based community development)*
Knowledge-based Services	*Increase quantity and quality of skills formation; form multi-agency partnerships around strategic R&D and deepen ICT access and usage*

Strategic action 1.5.1: Grow and develop the agriculture sector
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.5.2: Grow and develop the mining sector
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.5.3: Grow and develop the construction industry
This strategic action would not be impeded by the proposed Gas Infrastructure.

Strategic action 1.5.4: Grow and develop manufacturing industry
Nine identified manufacturing industries have potential for expansion. These should be examined in light of the Industrial Policy Action Plan with a view to multi-agency partnership formation. The nine industries are:

- *Maritime – connected to the province's three ports (ship repairs)*
- *Pharmaceutical – Aspen in Port Elizabeth employs 2 500 people*
- *Green/renewables – based on the existing pipeline of new wind-farms*
- *Agro-processing – based on increasing primary production*
- *Materials – products for the future through innovative R&D projects*
- *Light manufacturing – based on specialised clothing and footwear enterprises*
- *Automotive – increase manufacturing depth (first- and second-tier)*
- *Petro-chemicals – based on Karoo shale-gas and offshore resources*

- *Capital goods – based on investment plans of state-owned enterprises and heavy industry at Coega.*

Possible interventions include:
- *Improving regional competitiveness (logistics, skills, energy, R&D).*
- *Reviewing the Provincial Industrial Development Strategy (2009).*
- *Retaining and expanding the automotive industry, ensuring the auto cluster arrangement works effectively.*
- *Ensuring proper support for the growth of existing industrial development zones; expanding these zones to include other industrial areas in the metros; designing and implementing new agroindustrial special economic zones; and piloting a new rural industries programme.*
- *Reviving old labour-intensive industries, such as clothing and footwear.*
- *Promoting new-wave industries (green and maritime).*
- *Strengthening industrial cluster/multi-agency partnership initiatives.*
- *Ensuring the province's industrial development is environmentally sustainable and building industrial recycling enterprises (for example, platinum recycling).*

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The Coega Gas Infrastructure is proposed in the Sarah Baartman (was Cacadu) District Municipality. This aligns with the plan proposed in strategic objective 1.5.4. for growth in the provincial manufacturing industry by ensuring proper support (electricity supply) for the growth of existing industrial development zones

3.5.2 EASTERN CAPE SUSTAINABLE ENERGY STRATEGY (2012)

The Eastern Cape Sustainable Energy Strategy identifies six (6) goals which will assist in achieving the Province's vision, "The Eastern Cape provides the most enabling environment for sustainable energy investment and implementation in the country", and these goals include:
- Goal 1: Job creation and skills development
- Goal 2: Alleviate energy poverty
- Goal 3: Alleviate CO2 emissions and environmental pollution
- Goal 4: Improve industrial competitiveness
- Goal 5: Promote renewable energy production in the Province
- Goal 6: Promote the development of a renewable energy manufacturing industry and technology development

In addition, Section 6.2.2: Future Supply Options for the Eastern Cape of the Eastern Cape Sustainable Energy Strategy states that *"60 wind farms with a combined capacity of about 4 253 MW have applied to Eskom for connection quotations in the Province (as at March 2012); this is the most promising short- and medium-term source of locally generated energy for the Eastern Cape."*

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The proposed Coega Gas Infrastructure could potentially contribute, directly and/or indirectly, to Goals 1-4 as stipulated in the Eastern Cape Sustainable Energy Strategy.

4 RELEVANT LEGISLATION

The development of the proposed Coega Gas Infrastructure will be subject to the requirements of various items of South African legislation. These are described below.

4.1 THE CONSTITUTION ACT (ACT NO. 108 OF 1996)

This 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.
(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.
    (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

- *The developer (CDC) has an obligation to ensure that the proposed activity will not result in pollution and ecological degradation.*
- *The developer (CDC) has an obligation to ensure that the proposed activity is ecologically sustainable, while demonstrating economic and social development.*

4.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998 AND SUBSEQUENT AMENDMENTS)

The National Environmental Management Act (NEMA, Act No. 107 of 1998) provides for basis for environmental governance in South Africa by establishing principles and institutions for decision-making on matters affecting the environment.

A key aspect of the NEMA is that it provides a set of environmental management principles that apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. Section 2 of NEMA contains principles (see Table 4-1) relevant to the proposed Gas Infrastructure project, and likely to be utilised in the process of decision making by DFFE.

Table 4-1: 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; iii. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.

(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 must be appropriate in the light of such consideration and 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.
(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 these principles. Where this is not possible, deviation from these principles would have to be very strongly motivated.

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.

Employees who refuse to perform environmentally hazardous work, or whistle blowers, are protected in terms of NEMA.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

- *The developer (CDC) must be mindful of the principles, broad liability and implications associated with NEMA and must eliminate or mitigate any potential impacts.*
- *The developer (CDC) must be mindful of the principles, broad liability and implications of causing damage to the environment.*

4.3 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT (ACT NO. 57 OF 2003)

The National Environmental Management: Protected Areas Act (NEMPAA, Act No. 57 of 2003) mainly provides for the following:

- Declaration of nature reserves and determination of the type of reserve declared.
- Cooperative governance in the declaration and management of nature reserves.
- A system of protected areas in order to manage and conserve biodiversity.
- Utilization and participation of local communities in the management of protected areas.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The Act is relevant as the proposed Coega Gas Infrastructure is proposed within 10 km of a Nationally Protected Area (Addo Elephant National Park MPA). The potential impact of the proposed Gas Infrastructure has been investigated from a Visual and Socio-Economic perspective.

4.4 NATIONAL ENVIRONMENT MANAGEMENT: BIODIVERSITY ACT (NO. 10 OF 2004)

The National Environment Management: Biodiversity Act (NEM:BA, Act No. 10 of 2004) provides for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection.

The objectives of this Act are to:

- Provide, within the framework of the National Environmental Management Act.
- Manage and conserve of biological diversity within the Republic.
- Promote the use of indigenous biological resources in a sustainable manner.

The Act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act 107 of 1998. In terms of the Biodiversity Act, the developer has a responsibility for:

1. The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (including The Endangered and Threatened Ecosystem Regulations, Government Notice R. 1002 dated 9th December 2011).
2. 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.
3. Limit further loss of biodiversity and conserve endangered ecosystems.

The Act's permit system is further regulated in the Act's Threatened or Protected Species Regulations Government Notice R. 152, dated the 23rd of February 2007.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

- *The developer (CDC) must not cause a threat to any endangered ecosystems and must protect and promote biodiversity;*
- *The developer (CDC) must assess the impacts of the proposed development on endangered ecosystems;*
- *The developer (CDC) may not remove or damage any protected species without a permit; and*
- *The developer (CDC) must ensure that the site is cleared of alien vegetation using appropriate means (AIS Regulations, Government Notice R. 598 of the 1st of April 2014 are applicable)*

4.5 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT (NO. 39 OF 2004)

The National Environmental Management: Air Quality Act (NEM:AQA, Act No. 39 of 2004) is the principal legislation regulating air quality in South Africa. The objects of the Act are to:

- Give effect to Section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people, and
- Protect the environment by providing reasonable measures for:
  - Protection and enhancement of the quality of air in the Republic.
  - Prevention of air pollution and ecological degradation.
- Securing ecologically sustainable development while promoting justifiable economic and social development.

The Air Quality Act empowers the Minister to establish a national framework for achieving the objects of this Act. The said national framework will bind all organs of state. The said national framework will inter alia have

to establish national standards for municipalities to monitor ambient air quality and point, non-point and mobile emissions.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

Although no major air quality issues are expected, the developer (CDC) needs to be mindful of the Act as it also relates to potential dust generation during construction, etc.

4.6 National Environmental Management: Waste Management Act (No. 59 of 2008)

The National Environmental Management: Waste Management Act (NEM:WA, Act No. 59 of 2008) gives legal effect to the Government's policies and principles relating to waste management in South Africa, as reflected in the National Waste Management Strategy (NWMS).

The objects of the Act are (amongst others) to protect health, well-being and the environment by providing reasonable measures for:

- Minimising the consumption of natural resources;
- Avoiding and minimising the generation of waste;
- Reducing, re-using, recycling and recovering waste;
- Treating and safely disposing of waste as a last resort;
- Preventing pollution and ecological degradation; and
- Securing ecologically sustainable development while promoting justifiable economic and social development.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

- *The developer (CDC) must ensure that all activities associated with the project address waste related matters in compliance with the requirements of the Act.*
- *The developer (CDC) must consult with the local municipalities to ensure that waste is disposed of at a registered landfill site.*

4.7 National Forests Act (No. 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 Forests Act), no person may, except under licence:

- Cut, disturb, damage or destroy a protected tree.
- 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 COEGA GAS INFRASTRUCTURE

If any protected trees or indigenous forest in terms of this Act occur on site, the developer (CDC) will require a licence from the provincial Department of Forestry Fisheries & the Environment (DFFE) to perform any of the above-listed activities.

4.8 National Heritage Resources Act (No. 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 COEGA GAS INFRASTRUCTURE

- *SAHRA/ECHRA must be informed of the project and EIA process.*
- *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 relevant 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.*

4.9 Electricity Regulation Act (No. 4 of 2006)

The Electricity Regulation Act (Act No. 4 of 2006) came into effect on the 1st of August 2006 and the objectives of this Act are to:

- Facilitate universal access to electricity.
- Promote the use of diverse energy sources and energy efficiencies.
- Promote competitiveness and customer and end user choice.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The proposed Gas Infrastructure is in line with the call of the Electricity Regulation Act as it has the potential to improve energy security of supply through diversification.

4.10 Occupational Health and Safety Act (No. 85 of 1993)

The objective of this Act is to provide for the health and safety of persons at work. 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". The importance of the Act lies in its numerous regulations, many of which will be relevant to the proposed Coega Gas Infrastructure. These cover, among other issues, noise and lighting.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

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

4.11 National Water Act (No. 36 of 1998)

The National Water Act (NWA, Act No. 36 of 1998) provides for fundamental reform of the law relating to water resources in South Africa.

The purpose of the Act amongst other things is to:

- Ensure that the national water resources are protected, used, developed, conserved, managed and controlled in ways which consider amongst other factors:
  - Promoting equitable access to water;

- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Protecting aquatic and associated ecosystems and their biological diversity; and
- Reducing and preventing pollution and degradation of water resources.

The NWA is concerned with the overall management, equitable allocation and conservation of water resources in South Africa. To this end, it requires registration of water users and licenses to be obtained for water use except for certain limited instances set out in the Act. These instances include domestic use, certain recreational use, where the use occurs in terms of an existing lawful use or where the Department of Water Affairs (DWA) has issued a general authorisation that obviates the need for a permit.

Water use for which a permit is required
For the purposes of this Act, water uses for which a permit is required (amongst other), are defined in Section 21 as follows:

- Taking water from a water resource.
- Storing water.
- Impeding or diverting the flow of water in a watercourse.
- Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
- Disposing of waste in a manner which may detrimentally impact on a water resource.
- Altering the bed, banks, course or characteristics of a watercourse.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE
The proposed Gas Infrastructure does not trigger any of the listing triggers under Section 21 of the National Water Act (Act 36 of 1998).

4.12 Conservation of Agricultural Resources Act (No. 43 of 1983)

The Conservation of Agricultural Resources Act (CARA, Act No. 43 of 1983) is the main statute that deals with agricultural resource conservation.

The objects of the Act are to provide for the conservation of the natural agricultural resources of South Africa by the maintenance of the production potential of land. In order to maintain production potential of land, CARA provides for the following mechanisms; namely:

- Combating and prevention of erosion and weakening and destruction of water sources.
- Protection of vegetation.
- Combating of weeds and invader plants.

In order to give meaning to mechanisms aimed maintaining production potential of land provided for in CARA, Minister of Agriculture published regulations under CARA (CARA Regulations) which prescribes control measures which all land users have to comply, in respect of a number of matters, including the:

- Cultivation of virgin soil.
- Protection of cultivated land.
- Utilisation and protection of the veld.
- Control of weed and invader plants.
- Prevention and control of veld fires and the restoration and reclamation of eroded land.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE
The Coega SEZ was assessed and environmental authorisation granted in 2007 for the rezoning of the land within the delineated Coega SEZ boundary. It is presumed agricultural impacts related to the change of landuse authorised in 2007 have been assessed and approved and therefore are not relevant to this application. .

4.13 Subdivision of Agricultural Land Act (No. 70 of 1970)

The Subdivision of Agricultural Land Act (Act No. 70 of 1970) controls the subdivision of all agricultural land in South Africa and prohibits certain actions relating to agricultural land. In terms of the Act, the owner of agricultural land is required to obtain consent from the Minister of Agriculture in order to subdivide agricultural land.

The purpose of the Act is to prevent uneconomic farming units from being created and degradation of prime agricultural land. The Act also regulates leasing and selling of agricultural land as well as registration of servitudes.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

The Coega SEZ was assessed and environmental authorisation granted in 2007 for the rezoning of the land within the delineated Coega SEZ boundary. It is presumed agricultural impacts related to the change of landuse authorised in 2007 have been assessed and approved and therefore are not relevant to this application.

4.14 National Road Traffic Act (No. 93 of 1996)

The National Road Traffic Act (NRTA, Act No. 93 of 1996) provides for all road traffic matters and is applied uniformly throughout South Africa. The Act enforces the necessity of registering and licensing motor vehicles. It also stipulates requirements regarding fitness of drivers and vehicles as well as making provision for the transportation of dangerous goods.

RELEVANCE TO THE PROPOSED COEGA GAS INFRASTRUCTURE

All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed gas infrastructure.

4.15 Other Relevant National Legislation

Other legislation that may be relevant to the proposed Coega Gas Infrastructure includes:

- The Environment Conservation Act No 73 of 1989 (ECA) Noise Control Regulations, which specifically provide for regulations to be made with regard to the control of noise, vibration and shock, including prevention, acceptable levels, powers of local authorities and related matters.
- Provincial Nature and Environmental Conservation Ordinance (No. 19 of 1974), which lists species of special concern which require permits for removal. Schedules 1 to 4 list protected and endangered plant and animal species.
- Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013 – came into force on 1 July 2015) aims to provide inclusive, developmental, equitable and efficient spatial planning at the different spheres of the government. This act repeals national laws on the Removal of Restrictions Act, Physical Planning Act, Less Formal Township Planning Act and Development Facilitation Act.

In addition to the above, aside from the environmental authorisation, there are other permits, contracts and licenses that will need to be obtained by the project proponent for the proposed project some of which fall outside the scope of the EIA. However, for the purposes of completeness, these include:

- Local Municipality: Land Rezoning Permit. LUPO Ordinance 15 of 1985.
- National Energy Regulator of South Africa (NERSA): Generation License.
- Eskom: Connection agreement and Power Purchase Agreement (PPA).
- Nelson Mandela Bay Municipality (NMBM) Spatial Development Framework (SDF), Integrated Development Plan (IDP) and municipal by-laws.
- Sarah Baartman District Municipality SDF and IDP.

5 DESCRIPTION OF THE ENVIRONMENT

The following chapter outlines the biophysical features of the property portions on which the Coega Gas Infrastructure is being proposed.

5.1 BIOPHYSICAL ENVIRONMENT

5.1.1 CLIMATE

The Eastern Cape Province has a complex climate. There are broad 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.

The Coega SEZ region has a warm temperate climate and the temperature range is not extreme, although high temperatures can occur during summer. A time series of daily temperatures recorded within the Coega SEZ monitoring station during 2022 is presented in Figure 5-1.

Rain occurs throughout the year, brought about by convective summer rain and winter rain associated with the passage of frontal systems. The area has received an annual average rainfall of 413 mm for the period 2015-2022. A time series of daily average rainfall recorded within the Coega SEZ monitoring station during 2022 is presented in Figure 5-1

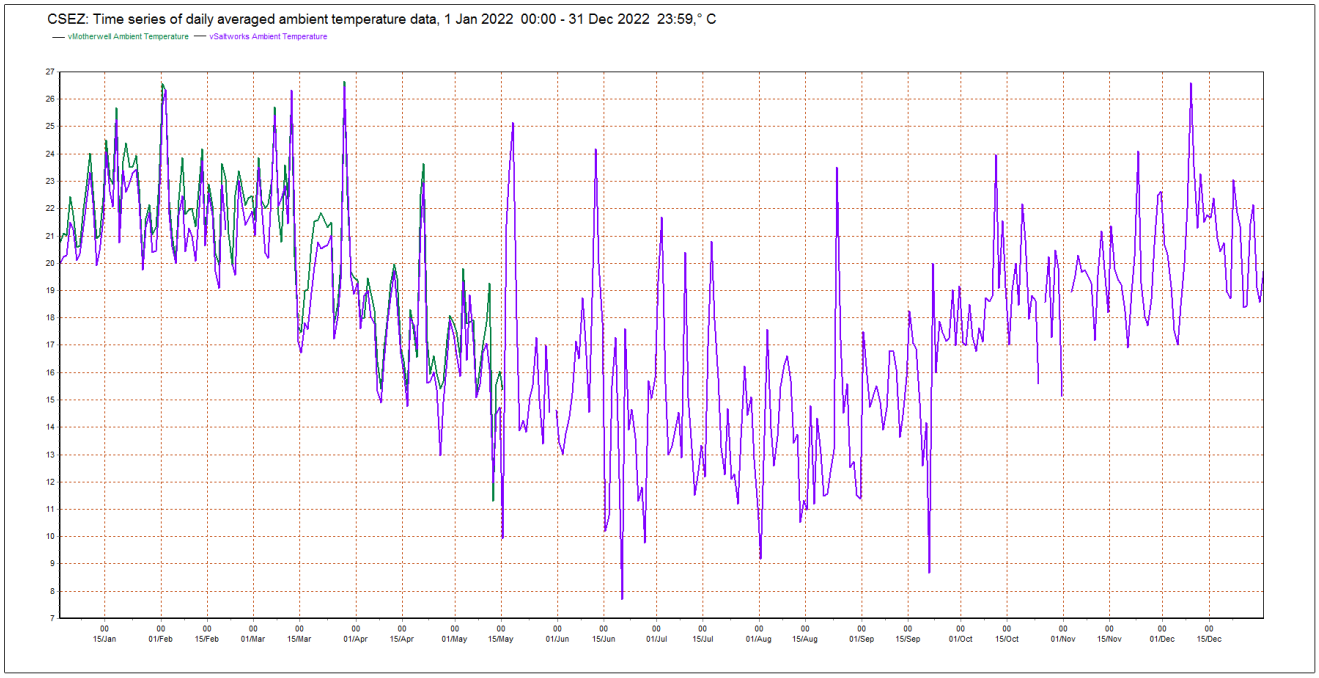


Figure 5-1: Time series of daily averaged ambient temperatures as recorded at SEZ-AQMN for January 2022 to December 2022, °C (Lethabo Air Quality Specialists, 2022)

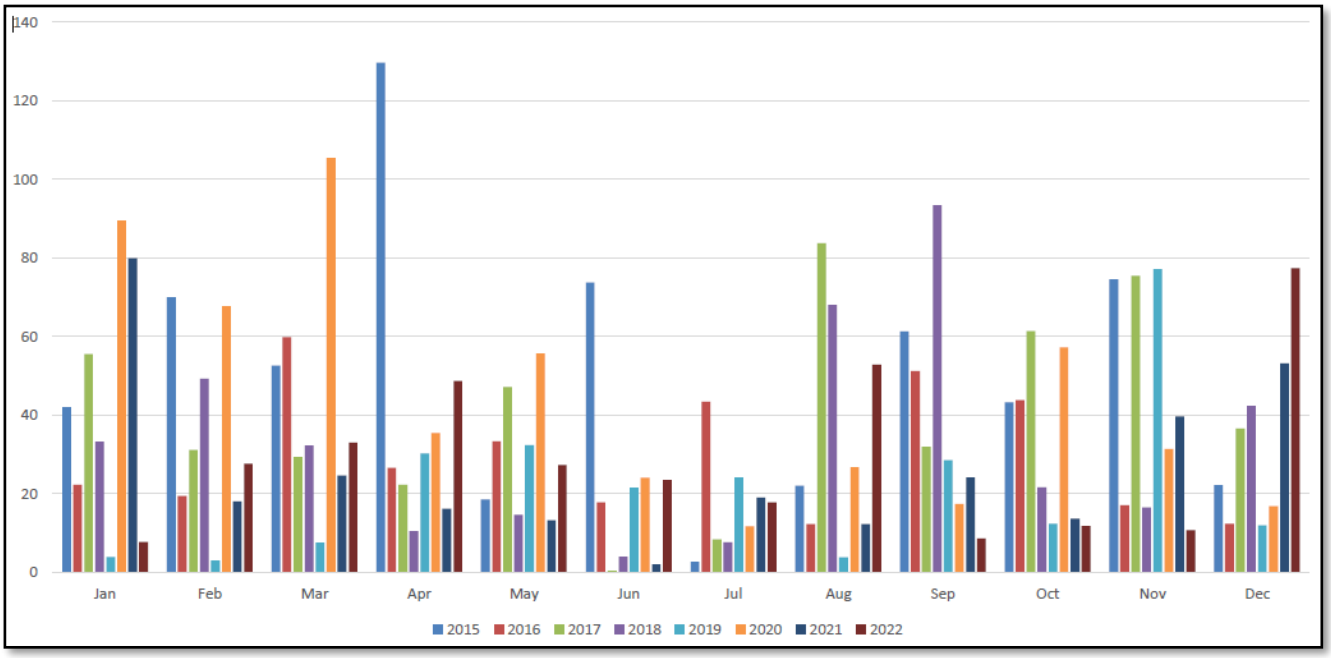


Figure 5-2: Time series of daily average rainfall as recorded at SEZ-AQMN for January 2022 to December 2022, mm (Lethabo Air Quality Specialists, 2022)

The prevailing summer winds are west-southwesterlies and east-northeasterlies. The prevailing winter seasonal winds are largely north-north-westerlies. Wind roses are presented for the Coega SEZ in Figure 5-4 & Figure 5-5.

The winds at indicate the occurrence of reasonably strong west to southwesterly synoptic scale winds. At Coega SEZ the winds are mainly from the west-northwest to southwest, north and east, also with an average wind speed of approximately 4.0 m/s.

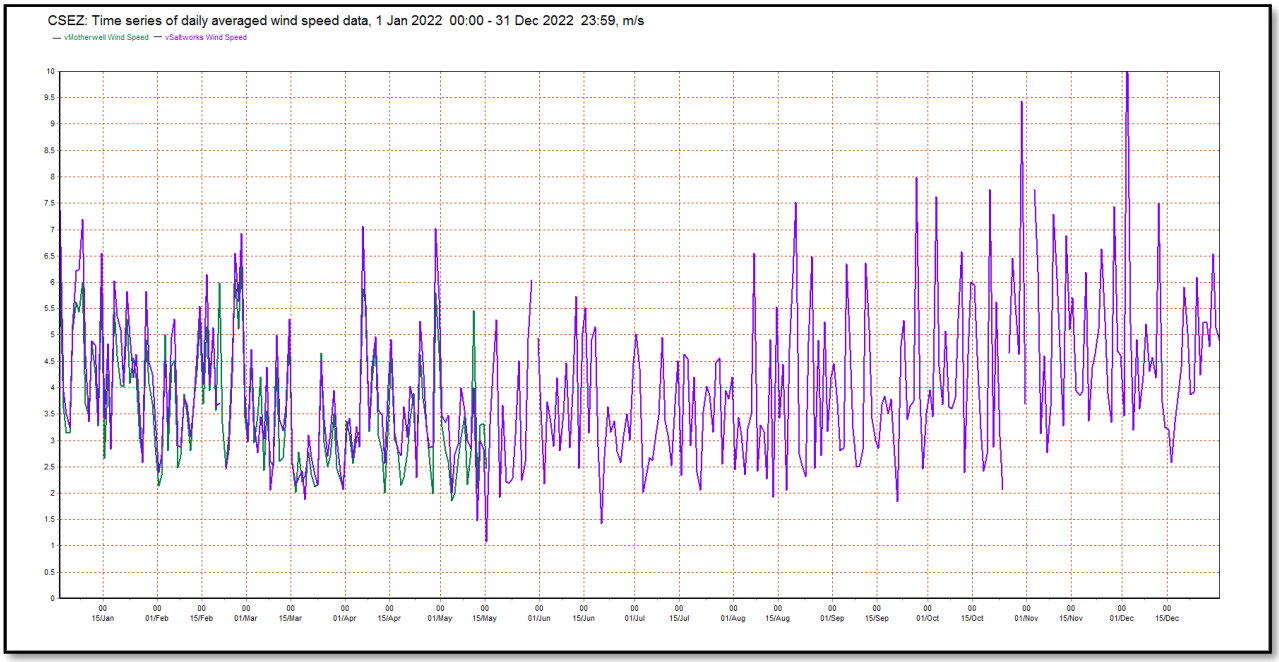


Figure 5-3: Time series of daily averaged wind speed as recorded at SEZ-AQMN for January 2022 to December 2022, m/s (Lethabo Air Quality Specialists, 2022)

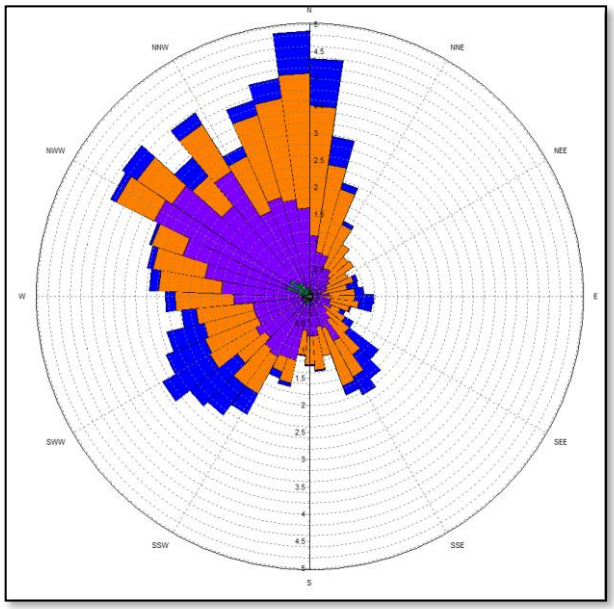


Figure 5-4: Winter seasonal (Mar-Aug) wind rose of Saltworks for 2022 (Lethabo Air Quality Specialists, 2022)

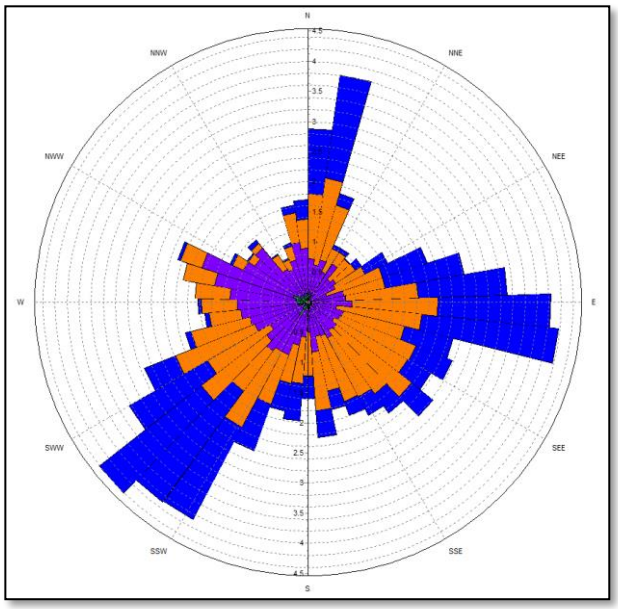


Figure 5-5: Summer seasonal (Oct-Feb) wind rose of Saltworks for 2022 (Lethabo Air Quality Specialists, 2022)

5.1.2 GEOLOGY

The bedrock around Port Elizabeth is characterised by the Peninsula Formation sandstones of the Table Mountain Group. This formation consists of coarse-grained super-mature quartzitic sandstone and is relatively resistant to erosion. It forms the bedrock of Algoa Bay and emerges as outcrops in the bay as the islands of St Croix, Jahleel, Bird and Brenton. The areas between these islands are filled with recent marine deposits (Alexandria Formation), which directly overlie the mudstones of the Kirkwood Formation. The geology of the Coega SEZ is characterised by coastal limestone, overlaid by calcareous sands blown onshore.

The Coega SEZ is underlain by a wide spectrum of sedimentary rocks spanning an age range of some 470 million years. These sediments are assigned to the Palaeoozic Table Mountain Group, the Mesozoic Uitenhage Group and the Caenozoic Algoa Group. Levels of bedrock exposure within the Coega SEZ are generally very low due to extensive cover by superficial drift (e.g. soil, alluvium, in situ weathering products) as well as by surface calcrete (pedogenic limestone) (Almond 2010).
The Coega Fault extends west of the Groendal Dam eastwards towards the coast, dipping at between 30° and 60° for about 120 km. It is a normal tensional fault with a vertical southward throw of 500 m to 100 m. A map showing the geology of the area is provided in Figure 5-6.

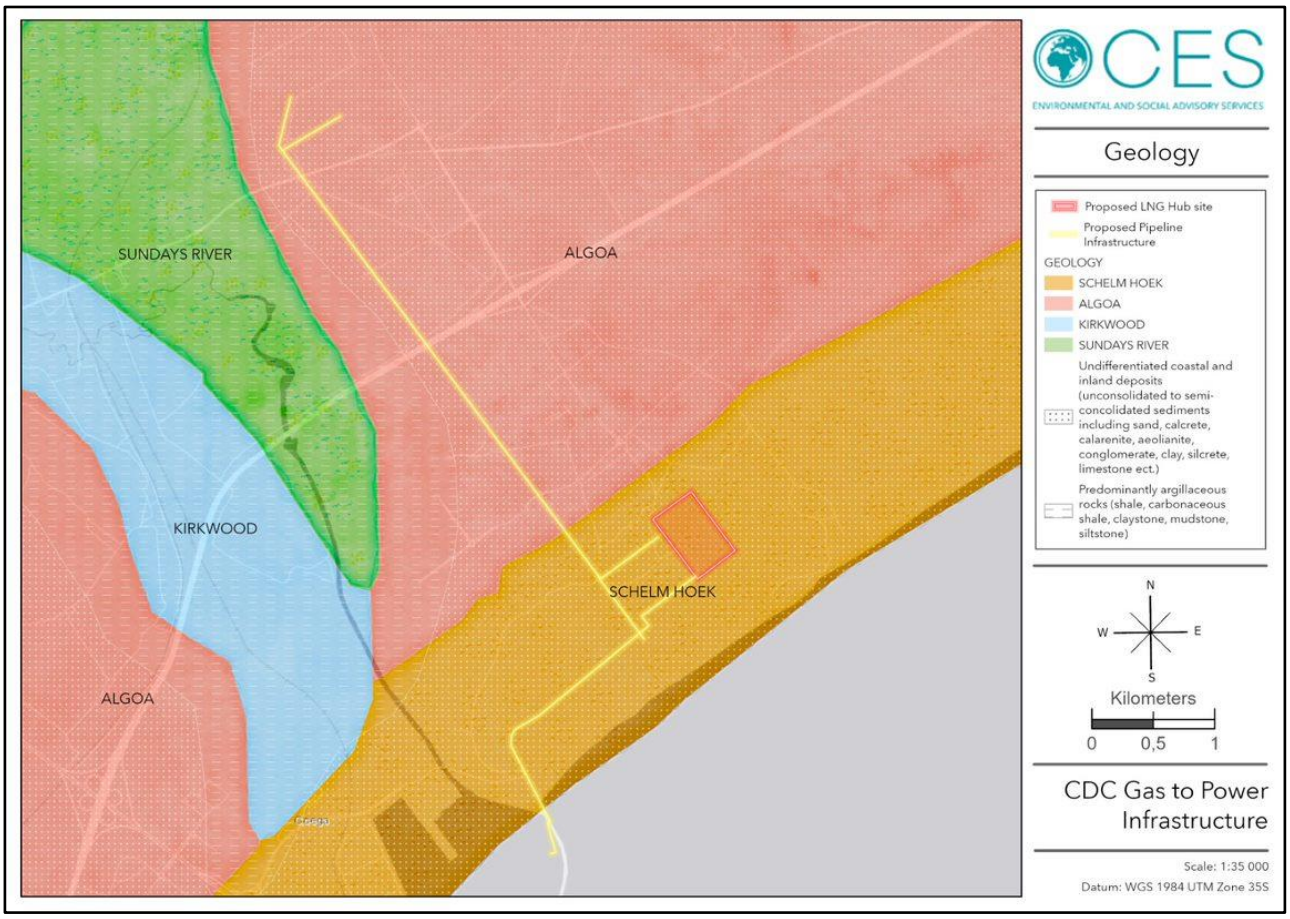


Figure 5-6: Geology Map of the project area.

5.1.3 TOPOGRAPHY

The SEZ is situated on a coastal platform that descends towards the sea in a series of gentle steps parallel to the existing coastline. This platform has been incised by the Coega River, which flows towards the sea across the western and south-western parts of the SEZ. The site in Zone 10 is largely covered by dunes and rises to approximately 60 m above sea level.

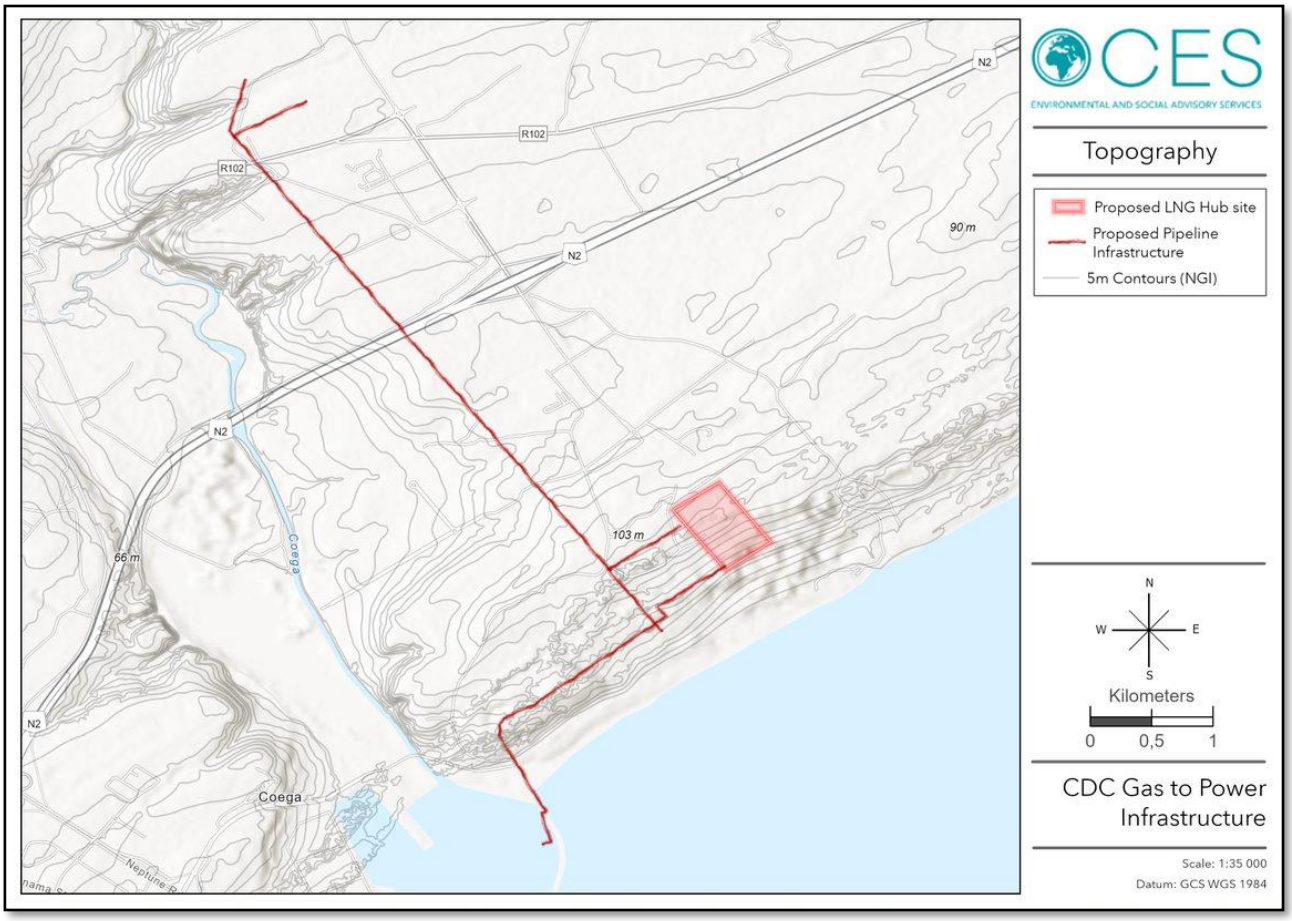


Figure 5-7: Contour Map of the project area.

5.1.4 Surface and Groundwater

The Coega River, which is a relatively small sand-bed river, is the most significant surface water feature associated with the Coega SEZ and flows to the west of the project site. The Coega catchment area is approximately 45 km long, 15 km wide and has a total area of about 550 km². The Coega River classification, based on preliminary river classification guidelines, ranges from moderately modified (i.e. C classification) in the upper reaches to critically modified (i.e. F classification) in the lower reaches at the Saltworks facility.

The SEZ is underlain by calcrete, sand and gravel deposits that overlie low permeability clays. These clays limit the vertical infiltration of rainwater and induce a horizontal groundwater flow towards the Coega River channel. Consequently, rapid run-off takes place following precipitation. Due to the limited infiltration of rainfall, a significant fluctuation in groundwater level does not occur, although groundwater levels can fluctuate by 3-4 metres with rainfall. Any contaminants originating from the power plant could infiltrate the sandy subsurface but would eventually emanate in seepage in the Coega River and beach environments.

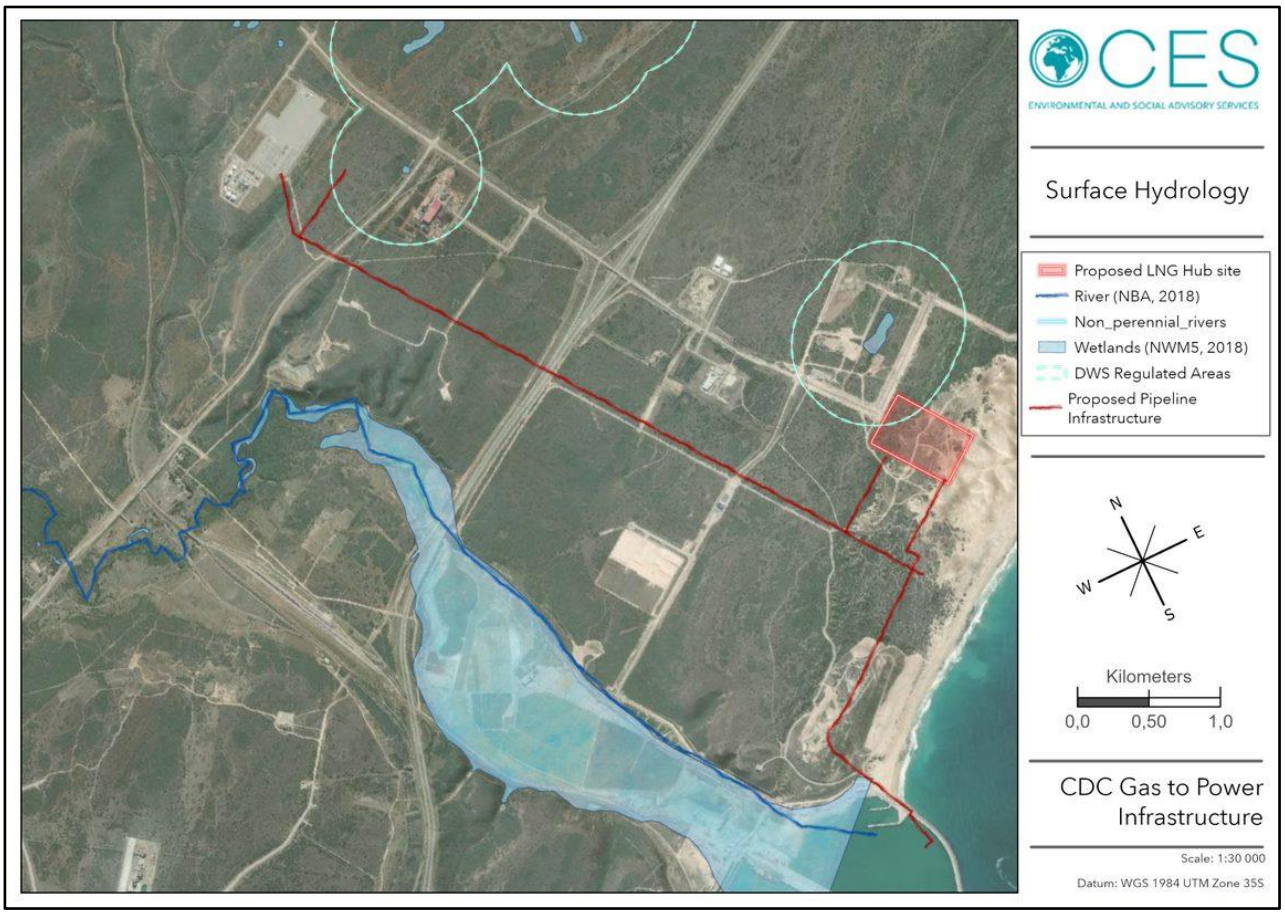


Figure 5-8: Surface Hydrology Map of the project area.

5.1.5 SOILS

The site predominantly occurs on shallow clay, often lime-rich soil on the Bluewater Bay, Alexandria, and Nanaga Formations. The most important land types are Fc and Ae. Lithology of the site is described as undifferentiated coastal deposits (unconsolidated to consolidated sediments including sand, calcrete, conglomerate, clay, limestone, etc.). According to the National Soils Database (SANBI, BGIS) soils on the site are described as shallow soils on hard or weathering rock with a restricted soil depth with limestone generally present within the landscape.

According to the South African Soil Classification System (Schultze et al, 1992) the LNG Hub, cryogenic pipelines, firewater pipeline and seawater intake pipeline are underlain by soils of ***Soil Class A/B***. These soils have low-moderate runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission. While the majority of the gas pipeline alignment is underlain by soils within ***Soil Class C*** – "infiltration rate is slow or deteriorates rapidly and permeability is restricted". Group C soils are classified as having a Moderately High runoff potential.

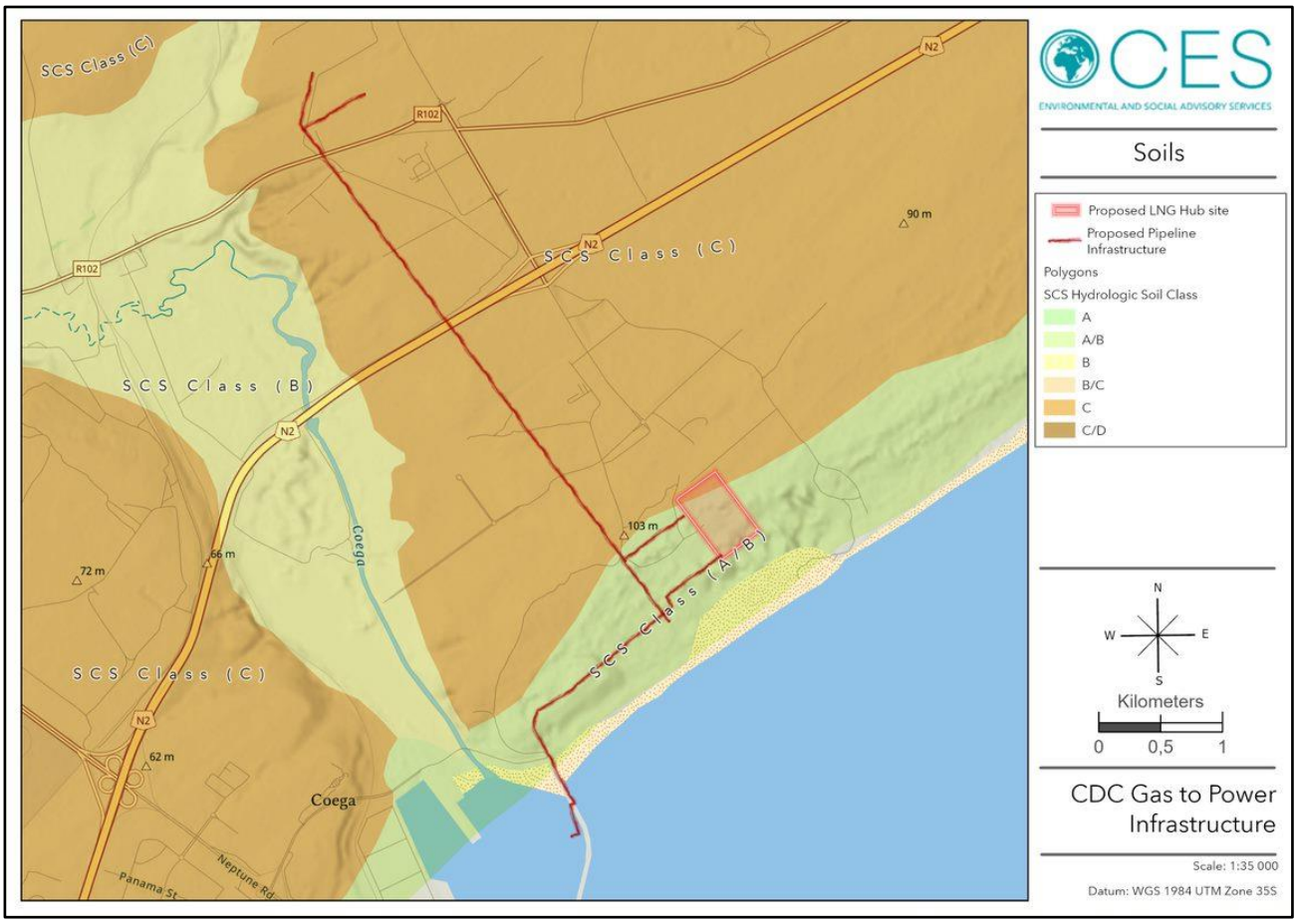


Figure 5-9: Soil Map of the project area.

5.1.6 LAND USE

The Coega SEZ consists of approximately 11,000 hectares of sector specific zoned land with purpose built infrastructure and is earmarked for industrial development. Land uses in the Coega SEZ presently consist of infrastructure, harbour facilities, industrial & commercially developed land, and vacant land. Vacant land is destined for a combination of future industrial land and open spaces, as per the CDC's Open Space Management Plan (OSMP). The OSMP has identified environmental No-Go areas that are to be protected from development. These No-Go areas have varying functions from natural areas, where emphasis is on conservation of areas to protect special vegetation types and preserve ecological processes, to recreational and visually attractive open space areas for relief in the built environment, screening off industrial buildings and softening the development.

The sites identified for the proposed Gas Infrastructure predominantly lie within Zone 8 (port), and Zone 10 of the Coega SEZ (see Figure 3-2). The Coega OSMP (2014) has identified Zone 10 for the use of the mariculture and aquaculture industries, as well as Gas to Power plants.

A small controlled use MPA exists around each of the islands, to protect important marine wildlife, while the remaining area of the MPA is designated as restricted use.

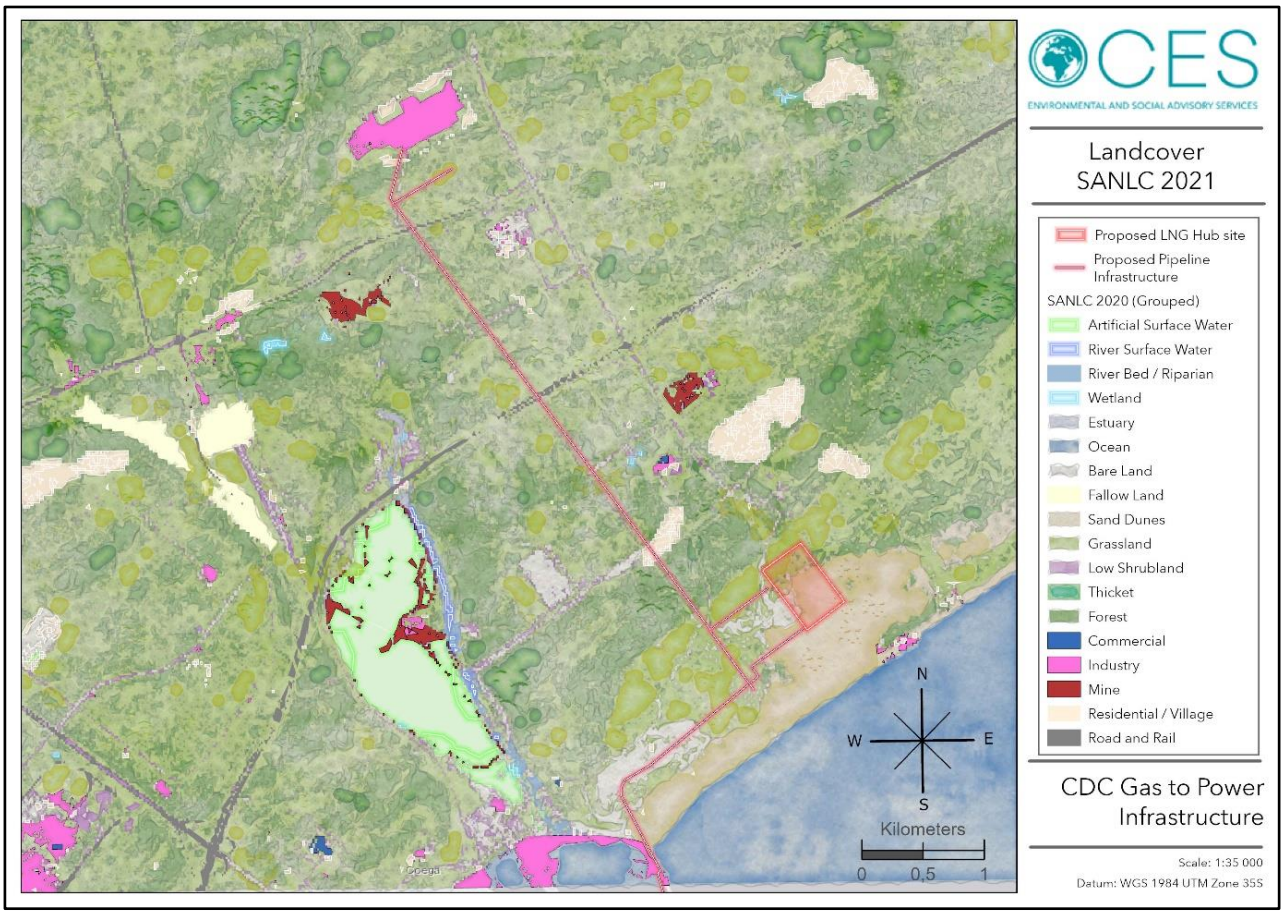


Figure 5-10: South African National Land-Cover Map of the project area.

The proposed location for the FSRU is in the Port of Ngqura, the area of influence also extends to the marine environment which includes Algoa Bay and the islands of St Croix, Brenton, Jahleel (offshore of the port) and Bird Island, Seal Island and Stag Island (offshore of Woody Cape). Jahleel Island is located less than 1 km from the eastern breakwater of the Port of Ngqura and falls under the Greater Addo Elephant National Park as do Bird and St. Croix Islands. The Addo Elephant National Park Marine Protected Area (MPA) was gazetted on 23 May 2019 and incorporates approximately 120 000 ha from the eastern breakwater of the port to Cape Padrone to the east, as shown in Figure 5-11.

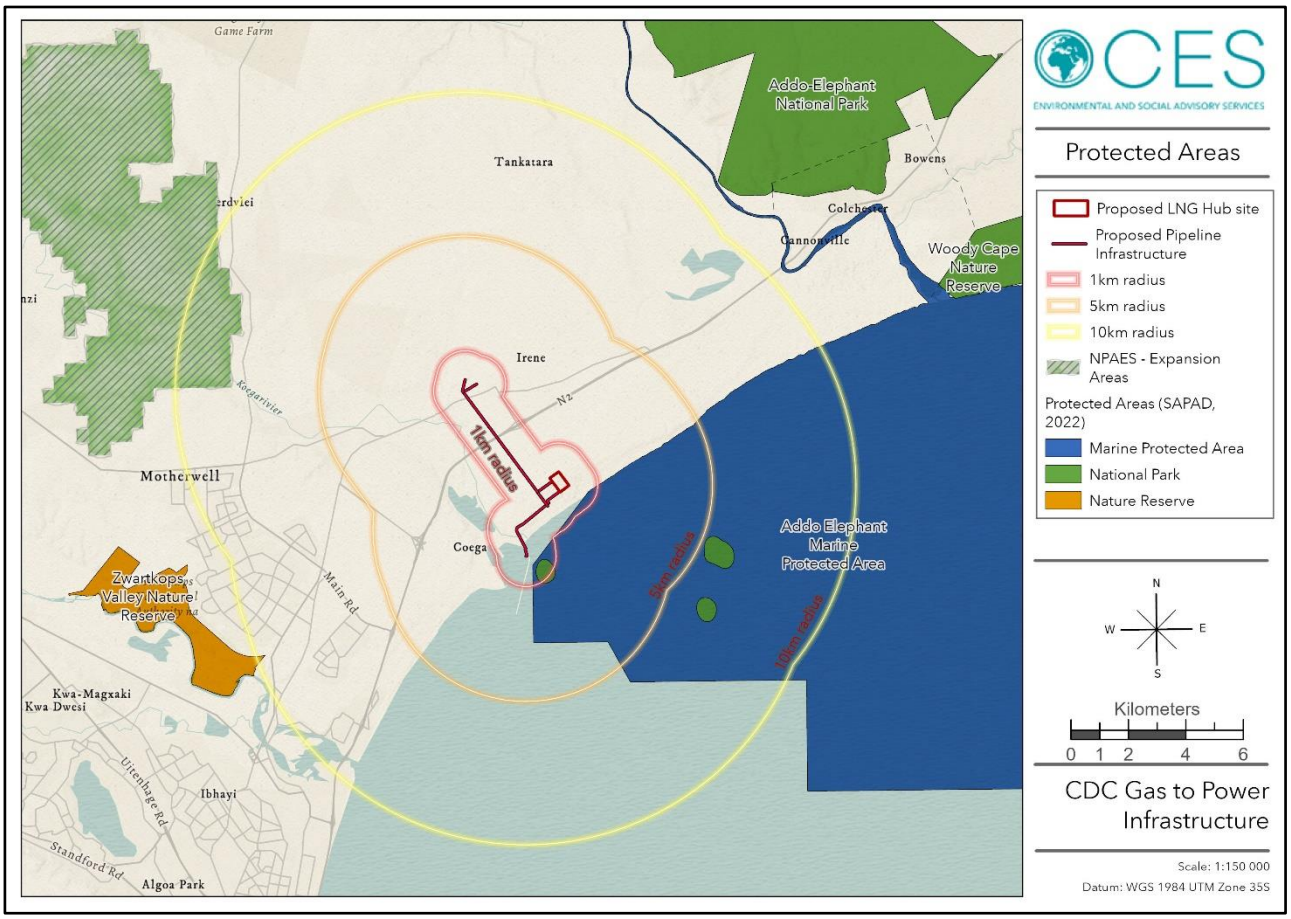


Figure 5-11: South African Protected Areas Database (SAPAD, Q3 2022).

5.1.7 SENSE OF PLACE

As per the Coega Development Zone Architectural Guidelines it is noted that the various operations to be established in the Core Development Area will result in tall or large structures that have a visual impact. The visual impact will be difficult to mitigate and the residual impact is regarded as high, as it will affect a wide area, will be permanent and will definitely occur. The current mitigation plan as per the CDC is that wherever possible, land-use planning has aimed to reduce the residual impact in such structures. Heavy industry has generally been located in the centre of the SEZ and screened from the N2. While it is some distance from the N2, any screening effects especially for any viewers along the coast, or from offshore (e.g. tourists visiting the MPA), would be limited for the Zone 10 LNG and gas hub site. Smaller scale industries are located in the western side of the SEZ.

5.1.8 REGIONAL WATER SUPPLY

The Algoa Water Supply Scheme currently comprises three major dams in the west, several smaller dams and a spring situated near to NMBM, as well as an inter-basin transfer scheme from the Orange River via the Fish and Sundays rivers to the east. The combined total yield of the Algoa Water Supply Scheme is 167.4 million m^3/a (458.6 ML/d). Additional water is supplied to the NMBM via the Nooitgedacht treatment work (currently 200 ML/day), and is It is expected that the development of the Coega Wellfield (which is currently underway) will further augment supply.

Figure 5-12 shows the availability of surplus water taking for a scenario where growth in water demand continues at historical levels, and with the addition of additional supply. And water conservation measures.

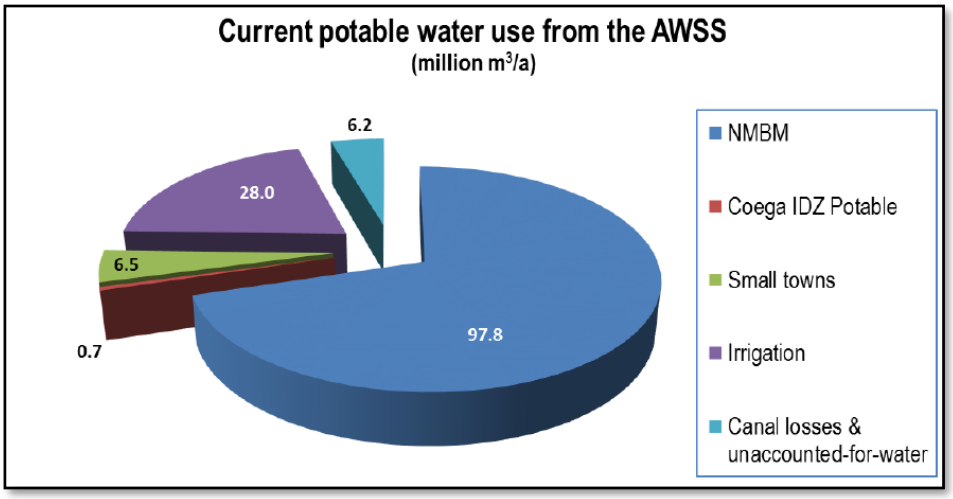


Figure 5-12: 2017/18 Algoa WSS Potable Water Use and predicted growth in water demand in the 'continue historical growth scenario' (Aurecon, November 2018)

5.1.9 AMBIENT NOISE

The existing ambient noise within the project area was measured at various points by Safetech, the appointed noise specialist, during June 2020. The ambient noise levels were found to vary between 30-50dB(A) during the day and 30-35dB(A) at night, with high variability (especially at the coastal sites) due to the proximity to the sea. The noise sources that have been identified for the proposed Gas Infrastructure footprint are as follows:

- Marine traffic (tugs and container ships);
- Quayside operations (mostly vehicle movement but also engineering activities relating to oil rig maintenance);
- Vehicle noise within the SEZ and along the N2;
- Metal smelting works;
- Power generation;
- Salt processing;
- Rail operations;
- Sea noise; and
- Wind noise.

There are currently no noise sources that are excessively dominant within the SEZ. Sea, wind and vehicle noise are the main contributors to ambient noise.

5.1.10 AMBIENT AIR QUALITY

Coega has an air quality monitoring network, consisting of three monitoring stations; at the Saltworks, Amsterdamplein and in Motherwell. These stations monitor both meteorological and ambient air quality parameters. Data at the monitoring stations is reported 10-minute averages. The monitoring stations at Amsterdamplein and the Saltworks measure particulate matter (PM_{10}), nitrous oxides (NOx) and sulphur dioxide (SO_2) as well as temperature, relative humidity, wind speed and wind direction. In addition, the station at the Saltworks measures wind speed in the vertical plane, atmospheric pressure, solar radiation and rainfall. The monitoring station at Motherwell measures NOx and SO_2 and particulate matter less than 10 microns (PM10) in size, in addition to the standard meteorological variables. The Amsterdamplein station is situated Zone 5 of the Coega SEZ.

The status of ambient air quality in the Coega SEZ is described below using data from the Saltworks monitoring site, and dispersion modelling for existing industries. Monitoring data provided accurate

measurement at a single point which may not be representative of the entire area of interest. Dispersion modelling stimulates estimated concentrations over the area.

Ambient monitoring data for 2015 - 2022 at Saltworks is analysed for SO_2, NO2, and PM10. Monitored SO_2 data show ambient levels for the monitoring period, with no exceedances of NAAQS (see Figure 5-13). Monitored NO_2 concentrations are elevated with higher concentrations observed in winter (i.e. June to August) (Figure 5-14). Monitored PM10 concentrations are elevated year-round with no exceedances of NAAQS (Figure 5-15).

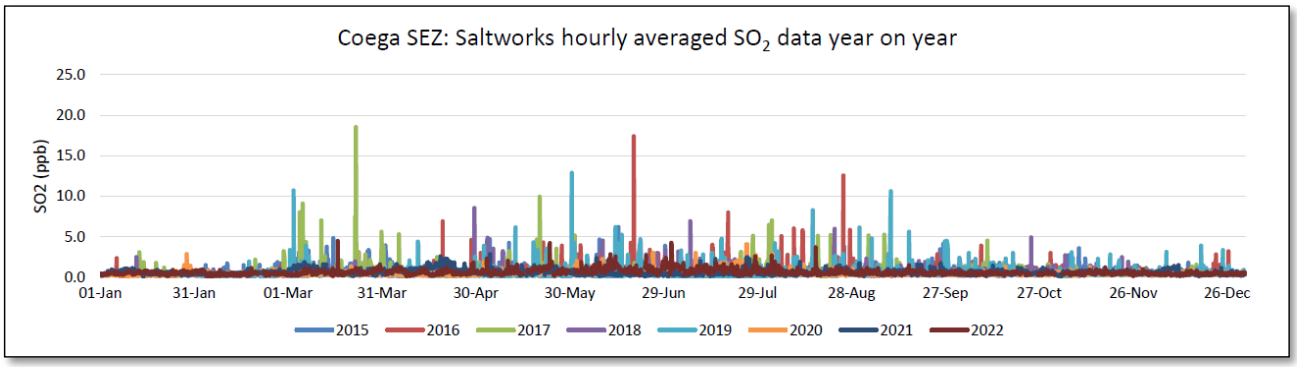


Figure 5-13: 1-hr average SO_2 monitored concentrations at Saltworks monitoring station (2015 – 2022)

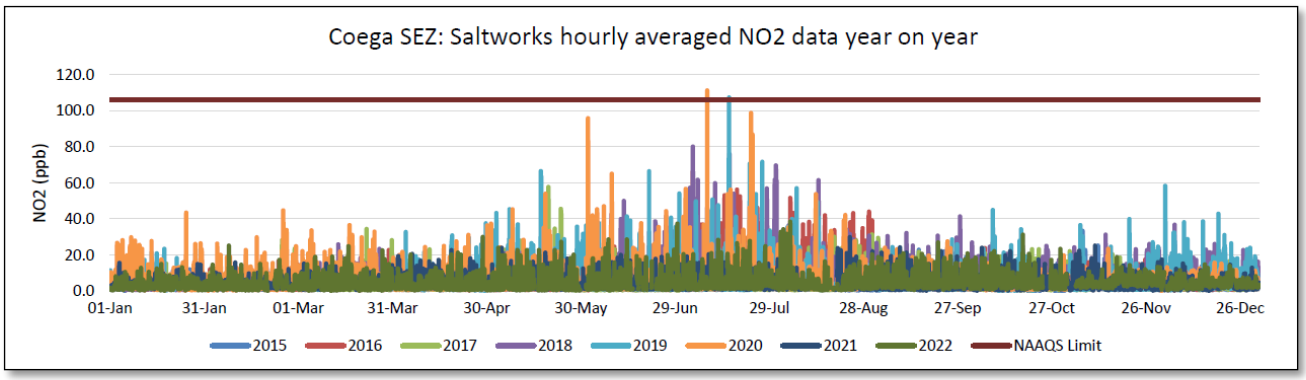


Figure 5-14: 1-hr average NO_2 monitored concentrations at Saltworks monitoring station (2015-2022)

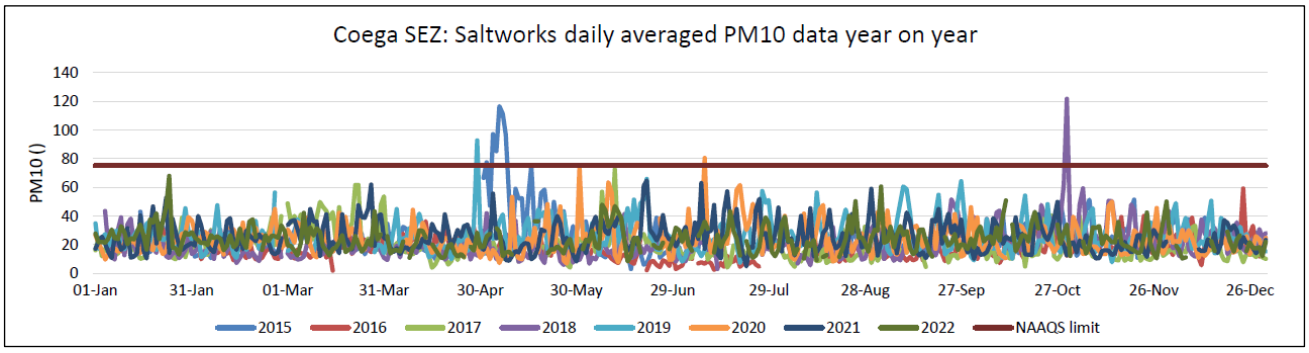


Figure 5-15: 24-hr average PM_{10} monitored concentrations at Saltworks monitoring station

5.1.11 HERITAGE RESOURCES

A general description of the archaeological and palaeontological resources found at the site area is provided below.

5.1.11.1 Archaeological Resources

Dr Johan Binneman, on behalf of CDC, conducted a Phase 1 Archaeological Impact Assessment of the greater Coega SEZ in 2010. All Zones (approximately 9 200 hectares) were investigated apart from Zone 8 as this is owned by the National Port Authority. Sensitive heritage sites identified during this study are shown on Figure 5-16.

Zone 10 is situated along the coast and different areas have been investigated several times by Dr Binneman. Most of the coastal foreland is covered by impenetrable alien Acacia, making it difficult to find archaeological sites/material. A few sites were found in the shifting dunes however further sites may be covered by sand and vegetation. The area is composed of calcrete bedrock covered by a thin layer of dark soil, which do not allow for any deep archaeological deposits. The hinterland behind the coastal dunes is also covered with dense dune and alien vegetation. Occasional weathered/sand polished Middle Stone Age and Later Stone Age stone tools were found along the immediate beach area. These stone tools are of low cultural significance.

Zone 13 is a narrow strip sandwiched between Zones 9, 11 and 14 and comprises mainly the upper Coega River valley with relatively steep sides. An archaeological impact assessment was conducted for the peaking power plant site in 2006. The Zone is well covered with low grass, dense patches of bushes, small trees and impenetrable thicket vegetation, which made it difficult to find archaeological sites/materials. Occasional stone tools were found during the survey for the peaking plant where pebble/cobble river gravels were exposed. The stone tools found were mainly small quartzite flakes, some were well weathered and displayed typical Middle Stone Age facetted striking platforms and features. Apart from the stone tools no other visible archaeological sites/material were found during the investigation.

According to the Phase 1 Archaeological Study conducted for the Coega SEZ (Binneman, May 2010), the most important archaeological sites were found along the coast (on National Ports Authority property) and included mainly shell middens which date from the past ±8,000 to 6,000 years. Similar sites in the shifting sand dunes and coast east of the harbour area were much smaller in size, 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. Earlier, Middle and Later Stone Age stone tools were found throughout the Coega SEZ where pebble/cobble gravel were exposed. They are of low significance, but concentrations of stone tools may be buried, especially areas around pans.

5.1.11.2 Palaeontological Resources

Dr John Almond of Natura Viva was commissioned to conduct a palaeontological heritage assessment as part of a comprehensive heritage assessment of the Coega SEZ in 2010.

The Coega SEZ is underlain by a wide spectrum of sedimentary rocks spanning an age range of some 470 million years. Most of the rock units concerned contain fossil heritage of some sort but in most cases this is very limited, with the notable exception of three marine successions – the Sundays River Formation of Early Cretaceous age (c. 136 Ma = million years old), the Alexandria Formation of Miocene / Pliocene age (c. 7-5 Ma), and the Salnova Formation of Mid Pleistocene to Holocene age (< 1 Ma).

Good examples of vertically sectioned dunes showing large scale aeolian cross-bedding are seen in the active sand quarries near the Sea Arc factory site and at Sonop (Coega Zone 10). Apart from the usual concentrations of wind-deflated dune snails (notably superabundant Tropidophora and Natalina), a range of subfossil remains can be seen, especially in deflation hollows. Among these are millipede exoskeletons, small mammal

and reptile bones, fragments of charcoal, buried mats of plant roots and incipient rhizocretions (possibly termite mediated). Shell middens of oysters and other edible marine shells situated close to the shoreline are attributable to Late Stone Age (and later) humans.

A small number of sites of special palaeontological and / or geological heritage significance were identified by Dr Almond within the Coega SEZ and are indicated on Figure 5-16. Examples include:

- Main Coega brick quarry – eastern face preserving fossil-rich sandstones and contact with overlying Alexandria Formation
- Main Coega limestone quarry – eastern face and large disturbed blocks of basal Alexandria shelly conglomerate at the western edge of the quarry
- Upper, eastern face of Tossies Quarry South – well-preserved contact between Alexandria and Sundays River Formations
- Erosion gullies into Sundays River Formation just north of Tossies Quarry North as well as on Bontrug 301 – highly fossiliferous sandstones, rare fossil taxa
- Railway cutting north of N2, SW of marshalling yard as well as the nearby stormwater channel – contact between the Alexandria and Kirkwood Formations, trace fossils near contact;
- Stratotype section of Salnova Formation on coast at Hougham Park, also showing unconformable contact with Sundays River Formation

According to (Almond, April 2010), most of the rock units in the Coega SEZ contain fossil heritage of some sort however in most instances this is very limited with the exception of the Sundays River Formation, Alexandria Formation and the Salnova Formation. The proposed sites in Zone 10 and 13 do not fall on any of these sensitive sites.

The proposed development for the FSRUs, jetty and pipelines all take place within the port on the inside of the existing modern breakwater, this area has seen a high level of activity as the Port of Ngqura is a recent development. Localised dredging will be undertaken to accommodate the port manoeuvring area, this dredging will be with an area that has been previously dredged and therefore SAHRA has confirmed that it is unlikely that any heritage remains will be uncovered during the construction process.

According to the South African Heritage Resources Association (SAHRA), during the development of the port (2004), the wreck of the County of Pembroke was uncovered. She wrecked in 1903 after running aground in Algoa Bay during a storm. When the remains of the wreck were discovered, she was the subject of emergency archaeological recording before being blown up and removed. Despite the discovery of a shipwreck during construction of the port, subsequent further development and dredging of the area means that the Maritime and Underwater Cultural Heritage (MUCH) unit at SAHRA considers the possibility of any impact on maritime heritage resources to be low.

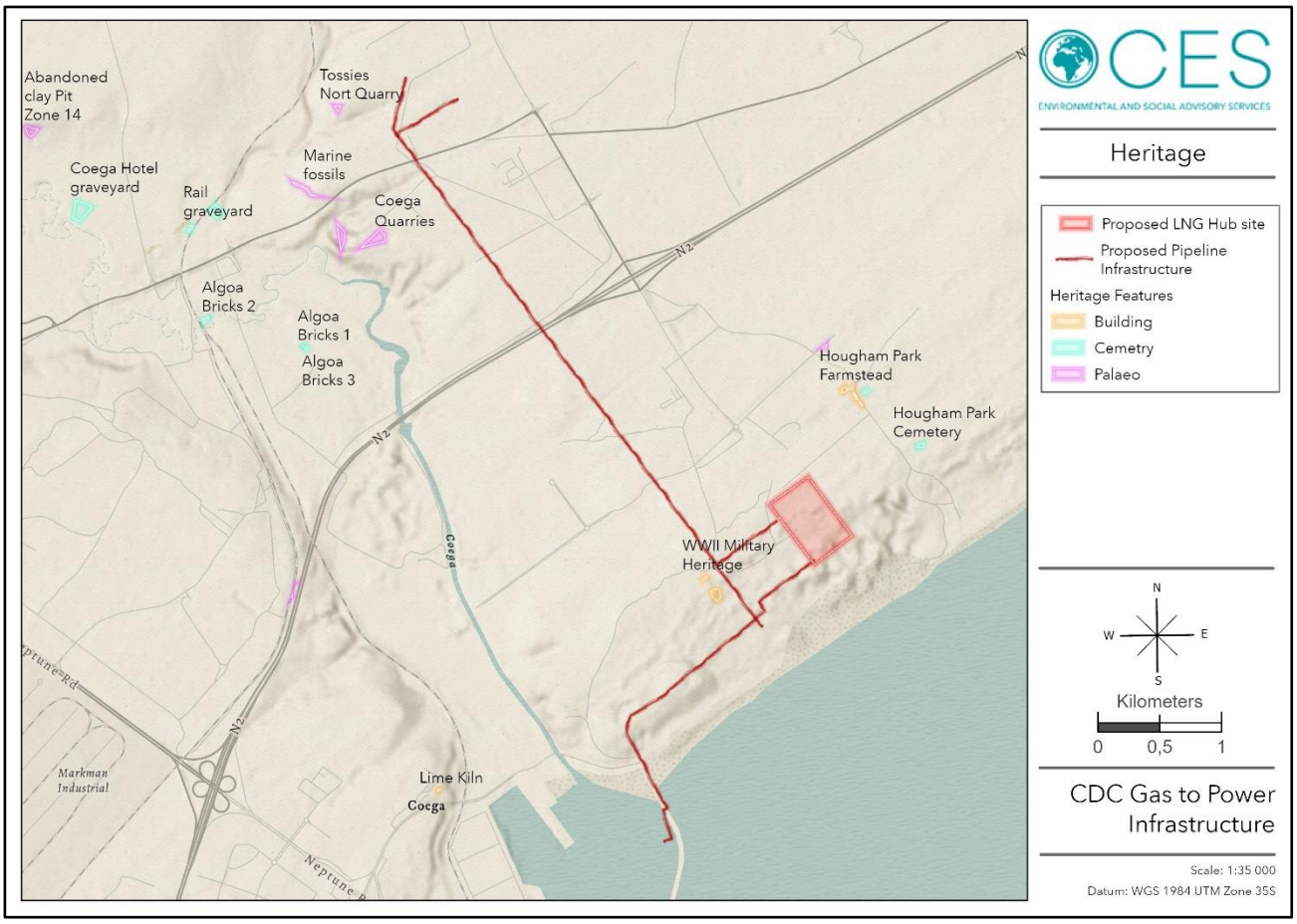


Figure 5-16: Sensitive Heritage Resources (Coega OSMP, 2014)

5.2 SOCIO-ECONOMIC ENVIRONMENT

At the last census, the population in the municipality was 1.3 million with a population growth of 2% and an unemployment rate is 26.7%. The youth unemployment rate was even higher, at 38.2%. The average household size is 3.4 members, with a dependency ratio of 57.3.

The nearest community to the project is Motherwell. During the 2011 census, 140 000 people lived in the community. Most of the residents were connected to the local sewage network and electrical grid. The average household size was 3.6 and more than 60% of the households received an annual income of less than R38 200.

With a GDP of R 128 billion in 2018, Nelson Mandela Bay contributed 34.07% to the Eastern Cape Province GDP of R 377 billion, and 2.63% to the GDP of South Africa of R 4.87 trillion in 2018. Its contribution to the national economy is 2.57%.

The Gross Value Added (GVA) is a measure of output (total production) of a region in terms of the value generated within that region. GVA can be broken down into various production sectors. As of 2018, the electricity sector in NMBM contributed R0.9 Billion (of a total national GVA of R111.3 billion), which amounted to 0.55% nationally.

5.3 BIODIVERSITY

5.3.1 BIOMES

The proposed Gas Infrastructure Project falls within the Albany Thicket Biome (Mucina et al., 2006-2018). This biome represents a species-rich, evergreen scrubland that covers an estimated 2.2% of South Africa's

total land surface area, making it the smallest biome in the country. It occurs throughout most of the Eastern Cape Province, particularly in incised river valleys. The distribution and structure of this biome is influenced by a range of abiotic and biotic factors, including topography, aspect, geology, geomorphology, temperature rainfall and herbivory (CEN, 2019).

Despite its small surface area, this biome is of significant conservation importance due to its high species richness (Carvalho, 2018). The Albany Thicket Biome has the highest number of endemic species of all biomes in the Eastern Cape and forms the core of the Albany Centre of Endemism (CEN, 2019). Unfortunately, this biome has become severely degraded due to clearing for cultivation and its poor ability to regenerate once disturbed (SANBI, 2021).

Approximately 60% of the Albany Thicket biome has been severely degraded, 7% of it has been transformed, and only 11% remains in pristine condition (Mucina et al., 2006-2018). Furthermore, approximately 19.8% of the remaining areas are classified as threatened (Skwono & Manyeki, 2021). Land degradation of thicket is due to factors such as cultivation, invasive alien vegetation, overgrazing, and urbanisation is an emergent threat (Loyd et al., 2002). Specifically, in the Coega region, the development of the IDZ has attracted large populations of people to the surrounding areas, placing increasing pressure on Albany Thicket vegetation types such as Coega Bontveld, hereafter referred to as Grassridge Bontveld n line with most recent descriptions, and Sundays Thicket, with the former comprising most of the project area.

5.3.2 VEGETATION TYPES (SA VEGMAP 2018)

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 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 SANBI's National Vegetation Map (2018), the vegetation types affected by the two (2) components of the proposed project include the following (Figure 5-17):

- → **Pipeline Infrastructure:** Grassridge Bontveld, Sundays Valley Thicket, St Francis Dune Thicket, and Cape Seashore Vegetation.
- → **LNG Hub Site:** Cape Seashore Vegetation and St Francis Dune Thicket.

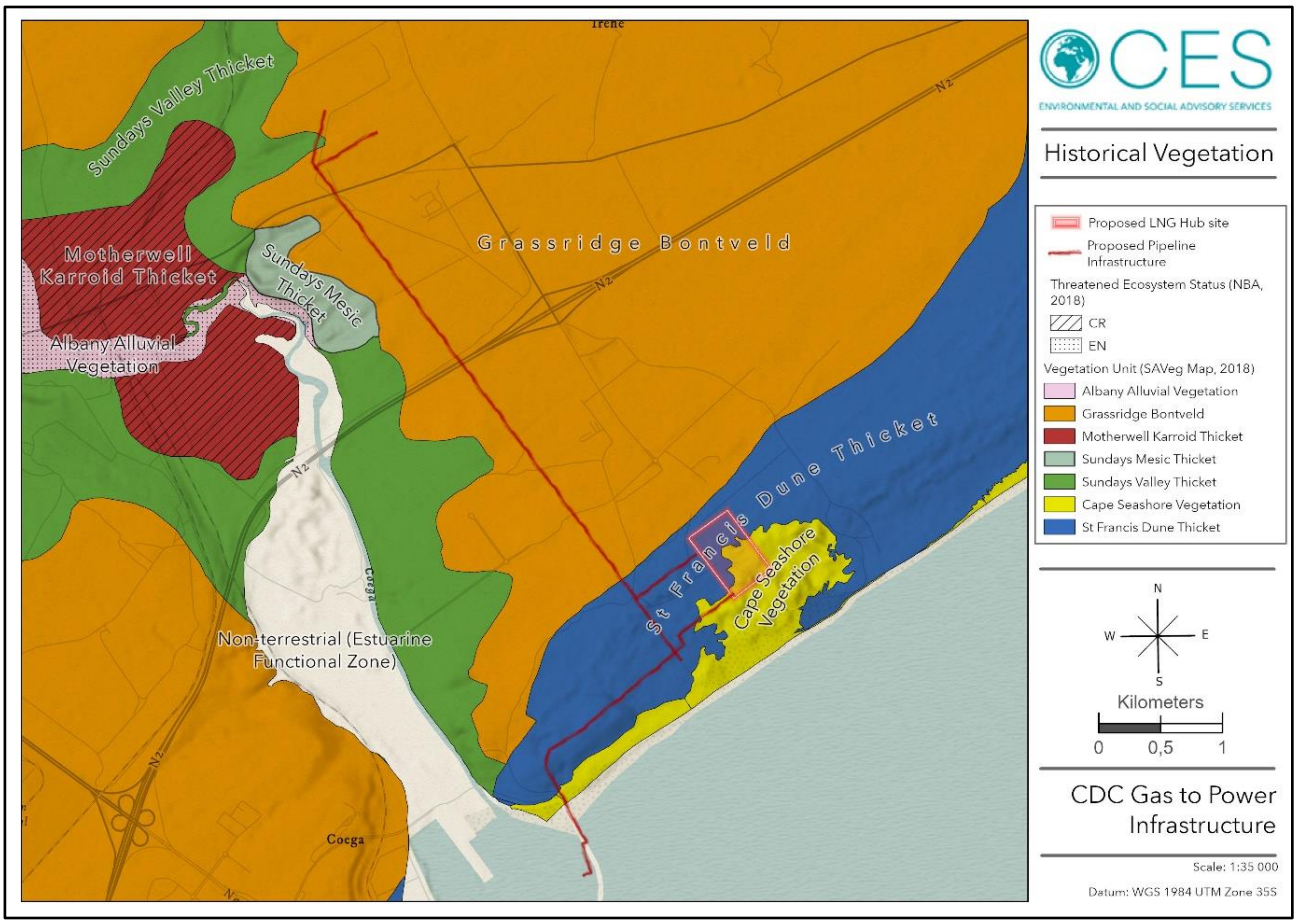


Figure 5-17: South African National Vegetation Map (SA Vegmap 2018)

5.3.2.1 Grassridge Bontveld

This vegetation type occurs on lime-rich shallow clays on moderately undulating plains and consists of a mosaic of low thicket (2-3m) encompassing bush clumps and grassy dwarf-shrubland. Within the grassy-shrubland there are fynbos, karroid and grassland elements, with *Themeda triandra* often dominant (Grobler *et al*., 2018). It is restricted to shallow stony soils on ridges strongly influenced by an underlying calcareous substrate (Carvalho, 2018). This uncommon soil and geological structure, along with the local climate, has given rise to a unique, semi-arid habitat that includes several rare and endangered localised endemics, and a host of SCC, often in the form of small succulents and geophytes (Grobler *et al*., 2018).

Thicket clumps are generally restricted to doline karsts created through the dissolution of limestone aggregations by rainfall and groundwater creating round depression which accumulate deeper soils allowing the establishment and growth of bigger thicket shrubs (Carvalho, 2018). Succulent patches are generally located on calcrete outcrops with shallow soils and a significant gravel component. Grassy shrubland comprises the remainder of the vegetation unit.

Important endemic and/or threatened species naturally occurring in Grassridge Bontveld Thicket include *Sideroxylon inerme* (LC), *Aloe africana* (LC) *Crassula ericoides* (LC), *Euphorbia globosa* (EN), *Rhombophyllum rhomboideum* (EN), *Berkheya heterophylla* (LC), *Acmadenia obtusata* (LC), *Blepharis procumbens* (LC), *Walhenbergia tenella* (LC), *Euryops ericifolius* (EN), *Achyranthemum recurvatum* (EN), *Zygophyllum divaricatum* (EN), *Ruschia congesta* (LC), *Crassula calcarea* (not assessed) *Trichodiadema intonsum* (LC) and *Ficinia truncata* (LC).

5.3.2.2 Sundays Valley Thicket

Sundays Valley Thicket occurs primarily in the lower Sundays River Valley region, from near Kleinpoort in the west toward Paterson and Colchester in the east and centred around Uitenhage in the lower Coega and

Swartkops River Valleys. It occurs on undulating plains, low foothills, and mountain slopes. Medium-sized to tall (3-5m) dense thicket in which the woody tree and shrub component, and the succulent component, are well developed, with many spinescent species. There are no distinct strata in the vegetation as the lower and upper canopy species intertwine, often with a wide variety of lianas linking the understorey with the canopy. This vegetation type is characterised by a dominant plant species, *Portulacaria afra* (Mucina *et al*., 2006-2018).

5.3.2.3 St Francis Dune Thicket

St Francis Dune Thicket occurs from about the mouth of the Tsitsikamma River eastwards, up to the Sundays River mouth and is largely restricted to the Schelm Hoek Formation (Grobler *et al*., 2018). Its structure and dynamics are like those of the Gouritz Dune Thicket, but it differs in having a richer assemblage of woody species present in the Thicket vegetation. Some of these are localised endemics (e.g., *Gymnosporia elliptica*) or near endemics (e.g., *Aloe africana*, *Rapanea gilliana*, etc.) that only also occur in the Albany Dune Thicket. This vegetation type also contains many highly localised endemics, several of which are critically endangered or already extinct, such as *Aspalathus cliffortiifolia, Lampranthus algoensis, Pentaschistis longipes, Selago polycephala, Selago zeyheri*, etc., due to urban development and invasion by alien vegetation in this region (Mucina *et al*., 2006-2018).

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 (1-3m) 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).

5.3.2.4 Cape Seashore Vegetation

Cape Seashore Vegetation is characterised by mobile sand and high salt loading and can be described as open, grassy sub-shrub vegetation on beaches, coastal dunes, dune slacks and coastal cliffs often dominated by a single pioneer species. Various plant communities reflect the age of the substrate and natural disturbance regime (moving dunes), distance from the upper tidal mark and the exposure of dune slopes (leeward versus seaward) (Mucina, *et al*., 2006-2018).

5.3.3 FAUNA

The Albany Thicket Biome, and particularly the Grassridge Bontveld habitat, hosts a variety of endemic, rare and threatened botanical and faunal species. This section provides a brief description of the fauna, specifically herpetofauna and mammals, excluding bats, which may occur within the project area. Avifauna and the associated impact, particularly on the Damara Tern which has a breeding colony next to the proposed hub site, are not assessed in this report, as a separate Avifaunal Impact Assessment has been conducted for the proposed development (see Knoppersen & Martin, 2021). Accordingly, the Damara Tern breeding habitat in the project area has been assigned in the CBA – IDZ and is regarded as a no-go area.

5.3.3.1 Herpetofauna

Approximately seventy-nine (79) herpetofauna species may occur within the project area (ADU 2011, SC&A 2016). This includes a total of seventeen (17) amphibian and sixty-two (62) reptile species. Of the amphibian species identified in this report, none are listed as Regionally Threatened nor Near Threatened. In contrast, six (6) of the reptile species are Threatened, while one (1) species is Data Deficient. Of the threatened species, four (4) species are marine (i.e., turtles). The breeding grounds of turtles in South Africa are located outside the province and any records in EC are most likely strandings of juveniles or sightings of migrating adults. Nevertheless, all turtles are protected under the Marine Living Resources Act (1999), CITES, PNCO, and the Convention for Migratory Species (CMC) to which South Africa is a signatory.

In addition, eight (8) amphibian species are Endemic and one (1) is Near Endemic, while twenty-two (22) reptile species are Endemic and eight (8) are Near Endemic. While most of the herpetofauna identified in the Ecological Impact Assessment report are classified as Least Concern, all amphibian, turtle, and lizard species, as well as fourteen (14) snake species, are protected by the PNCO (Act No. 15 of 1974).

5.3.3.2 Mammals

Of the 62 mammal species known or expected to occur in the Coega area, none are now considered endemic to the coastal region. According to Stuarts' Field Guide to Mammals of Southern Africa (2015), fifty-five (55) mammal species have a known distribution within the project area. All but three (3) of these species are classified as Least Concern. Both *Aonyx capensis* (African Clawless Otter) and *Otomys irroratus* (Vlei Rat) are classified as Near-Threatened, while *Chlorotalpa duthieae* (Duthie's Golden Mole) and Sensitive Species 5 is classified as Vulnerable.

5.3.3.3 Birds

Martin (2007-2019) has compiled a comprehensive annotated list of all the bird species recorded in the Coega SEZ. According to this list, approximately one-hundred-and-fifty (153) bird species are likely to occur within the project area, ten (10) of which are considered SCC. Seven (7) of the species recorded are associated with the marine and coastal environments. Of the thirty (30) endemic/near-endemic species recorded, twenty-three (23) occur within the thicket and bontveld vegetation types of the project area.

Two Important Bird Areas (IBAs) lie offshore of the proposed development. The Bird island cluster lies approximately 50 km offshore while the St Croix island cluster lies approximately 5 km offshore. The St Croix island cluster includes the islands of St Croix, and Jahleel. St. Croix Island is home to a large breeding colony of African penguins. Bird Island supports the largest breeding colony of Cape gannets in the world (over 160 000 birds) as well as other birds such as African penguins and rare roseate terns.

The Algoa Bay islands currently hold 43% of the global population of the African Penguin (*Spheniscus demersus*), the majority of which are on St Croix. St Croix also holds a locally significant breeding population of the Cape Cormorant (Phalacrocorax capensis) (Birdlife International, 2020). Bird Island is one of only six breeding sites in the world for Cape Gannet (Morus capensis). Kelp Gull (*Larus dominicanus*) and African Black Oystercatcher *Haematopus moquini* are found throughout the Algoa Bay complex.

Globally threatened species are the African Penguin (11 304 breeding pairs; Crawford et al. 2012), Cape Cormorant (284 breeding pairs; Crawford et al. 2012), Cape Gannet (83 000 breeding pairs; Crawford et al. 2012) and African Black Oystercatcher (55 breeding pairs; SANParks census). Regionally threatened species are the Caspian Tern (*Hydroprogne caspia*) and Roseate Tern (90–100 breeding pairs; Crawford et al. 2012). The species reaching the 1% or more congregatory threshold are Kelp Gull (*Larus dominicanus)* and Antarctic Tern, while Swift Tern (*Thalasseus bergii*) (130 breeding pairs; Crawford et al. 2012) and Ruddy Turnstone (*Arenaria interpres*) are thought to reach the 0.5% or more congregatory threshold.

Due to its varied habitats, the Coega terrestrial region has diverse avifauna and over 150 species are resident or common visitors to the region (CES, 1997). Most diversity occurs in the thicket clumps. A number of terrestrial birds are of conservation concern including the blue crane (*Anthropoides paradiseus*), Denham's bustard (*Neotis denhami*), the Martial eagle (*Polemaetus bellicosus*) and the African marsh harrier (*Circus ranivorus).* Taylor et al. (2015) lists blue crane as Near Threatened, and Martial eagle and African marsh harrier as Endangered. The Denham's bustard is considered Vulnerable in South Africa (Barnes, 2000).

There is a breeding colony of Damara Terns within 200-300 m of the proposed Gas Infrastructure. Under the regional Red Data list Damara Tern is listed as Critically Endangered and African Black Oystercatcher as Least Concern (Taylor et al. 2015). Globally, Damara Tern is listed as Vulnerable and African Black Oystercatcher as Least Concern (BirdLife International, 2020). Other species such as the Spotted Thick-knee (*Burhinus capensis*) and Kelp Gull (*Larus dominicanus*) both rated as Least Concern (Birdlife International, 2020) utilise the coastal area, with nesting sites within the Cerebos and Port areas. This observation by the CDC Environmental Control Officer (ECO) was noted in the FSR of the Kalagadi Manganese smelter plant (CES, 2008).

Other terrestrial species of conservation concern in a regional context include the secretary bird (*Sagittarius serpentaris*) and the Knysna woodpecker (*Campethera notata*). The secretary bird is considered Vulnerable (Taylor et al., 2015) and the Knysna woodpecker is considered Near-Threatened in South Africa (Barnes, 2000). No breeding populations of all these terrestrial species are known in the Coega region, and with the exception of Stanley's bustard all are uncommon visitors.

5.3.3.4 Terrestrial Invertebrates

The distribution of the terrestrial invertebrates found along the coast depends to a large degree on the extent and composition of the natural vegetation. One grasshopper species (*Acrotylos hirtus*) is endemic to the dunefields. Of nearly 650 butterfly species recorded within the borders of South Africa, 102 are considered of conservation concern and are listed in the South African Red Data Book for Butterflies. Two have become extinct, whilst three rare butterflies are known from a number of scattered localities in the Coega region.

The small blue lycaenid butterfly *Lepidochrysops bacchus* is known from four localities in the Eastern Cape. One of these is reported to occur in the "general area" of the Coega SEZ, but not within the port area. Another rare small copper lycaenid, *Poecilimitis pyroeis*, has a similar distribution to *Lepidochrysops bacchus*, extending from the southwestern Cape to Little Namaqualand. An isolated eastern race, P.p. hersaleki, was described from Witteklip Mountain (Lady's Slipper) to the west of Port Elizabeth. It has also been recorded from St Albans and from the Baviaanskloof Mountains. There is currently no evidence that this rare butterfly occurs in the Coega area, or that a suitable habitat for the eastern race exists in the port area (CES, 1997).

According to the DFFE online screening tool report, two additional species of conservation concern, *Chrysoritis thysbe whitei* and *Aloeides clarki* (the Coega Copper) are recorded for the area, and during recent search and rescue operations in Zone 10 the threatened Eastern Cape Golden Baboon Spider (*Harpactira tigrine*) was found.

5.3.4 ALIEN INVASIVE SPECIES

An "invasive species" is any species whose establishment and spread outside of its natural distribution range (i) threatens ecosystems, habitats or other species or has a demonstrable potential to threaten ecosystems, habitats, or other species; and (ii) may result in economic or environmental harm or harm to human health. Invasive alien plant species are globally considered as one of the greatest threats to the environment, biodiversity, ecosystem integrity and the economy.

According to the National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEMBA), for natural areas, invasive alien plant species should be controlled and eradicated with an emphasis on urgent

action in biodiversity ancillary areas. NEM:BA published a list of Alien and Invasive Species (No 599) in 2014 which regulates the management of alien and invasive plants in natural environments.

The following NEMBA listed alien invasive species were recorded within the project footprint:

Table 5-1: Alien Invasive Species within the project footprint

Family	Species Name	Common Name	NEM:BA
Amaranthaceae	*Salsola kali*	Saltwort / tumbleweed	1b
Cactaceae	*Opuntia ficus-indica*	Prickly Pear	1b
Cactaceae	*Opuntia stricta*	Shell Mound Pricklypear	1b
Euphorbiaceae	*Ricinus communis*	Castor Bean	2
Fabaceae	*Acacia cyclops*	Rooikrans	1b
Fabaceae	*Acacia saligna*	Port Jackson Willow	1b

5.4 Protected and Regulated Areas

5.4.1 Eastern Cape Biodiversity Conservation Plan (2019)

The ECBCP (2019), which replaces the ECBCP (2007), provides a map of important biodiversity areas which can be used to inform land use and resource-use planning and decision making in the Eastern Cape Province.

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 patterns 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 is 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.

However, the ECBCP (2019) recognises the NMBM Bioregional Plan (2015) and the Coega CDC's OSMP (2014), which has been mapped at a finer scale with detailed expert input, stakeholder engagement, and is legally enforced and implemented by the responsible agencies. So as not to clash, these local-scale biodiversity plans have been incorporated into the ECBCP without modification. As such, only the ECBCP aquatic CBAs have been mapped in this report (see Figure 5-18), followed by NMBM MOSS CBAs and Coega OSMP (2014) Primary Networks (see Figure 5-18 and Figure 5-19, respectively). Primary Networks, now referred to as CBA – IDZ, describe natural areas of high conservation value that serve to protect special vegetation types, as well as preserve ecological processes.

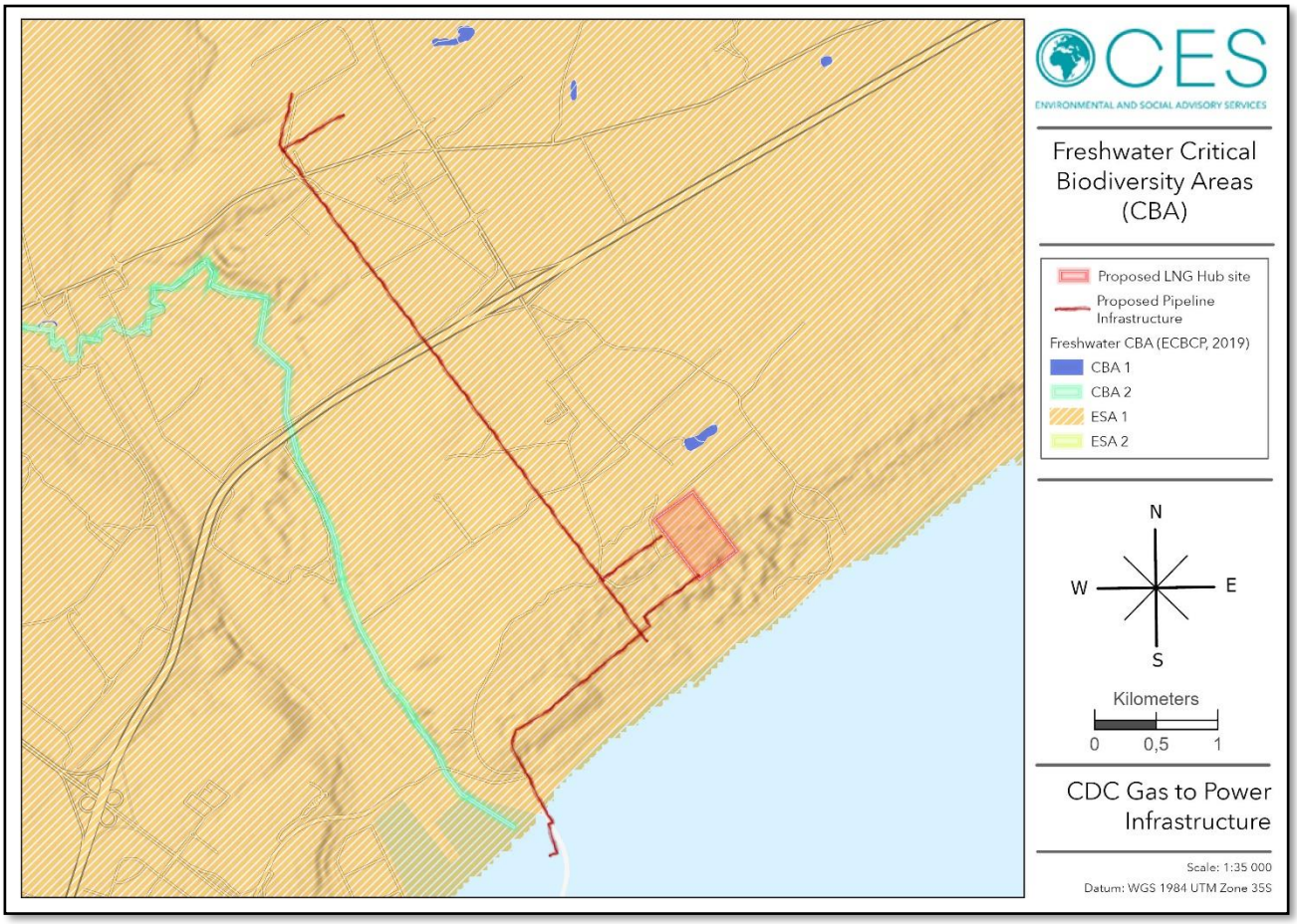


Figure 5-18: ECBCP (2019) Aquatic CBAs

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

5.4.2 Coega Open Space Management Plan (OSMP)

The Coega Open Space Management Plan (OSMP) sets out the uses of the open space areas within the Coega SEZ. The OSMP informed the preparation of the Management Guidelines for the various open space uses identified on the plan, to identify the actions required to implement the Management Guidelines.

According to the Coega OSMP (2014), the proposed project does not fall within a Primary Core Network (CBA - SEZ) but does fall within a Secondary Support Network (see Figure 5-19). The Secondary Network refers to non-conservation areas that are open space but do not have intrinsic biodiversity value. It also includes the major transportation and service servitude routes between different open spaces and other land uses within the SEZ. However, the OSMP does identify areas of Species of Conservation Concern. According to the Coega OSMP (2014), the following ecologically sensitive areas (refer to Figure 5-20) surround the development footprints:

- Rare Butterfly Habitat – protected by a 100 m wide buffer zone, which is fenced off and kept clear of development and public access;
- Damara Tern Colony – breeding habitat earmarked for protection;
- Sensitive Animal Species – including a population of *Aloeides clarki*; and
- Sensitive Plant Species – including a population of *Marsilea schelpeana* a rare aquatic plant species

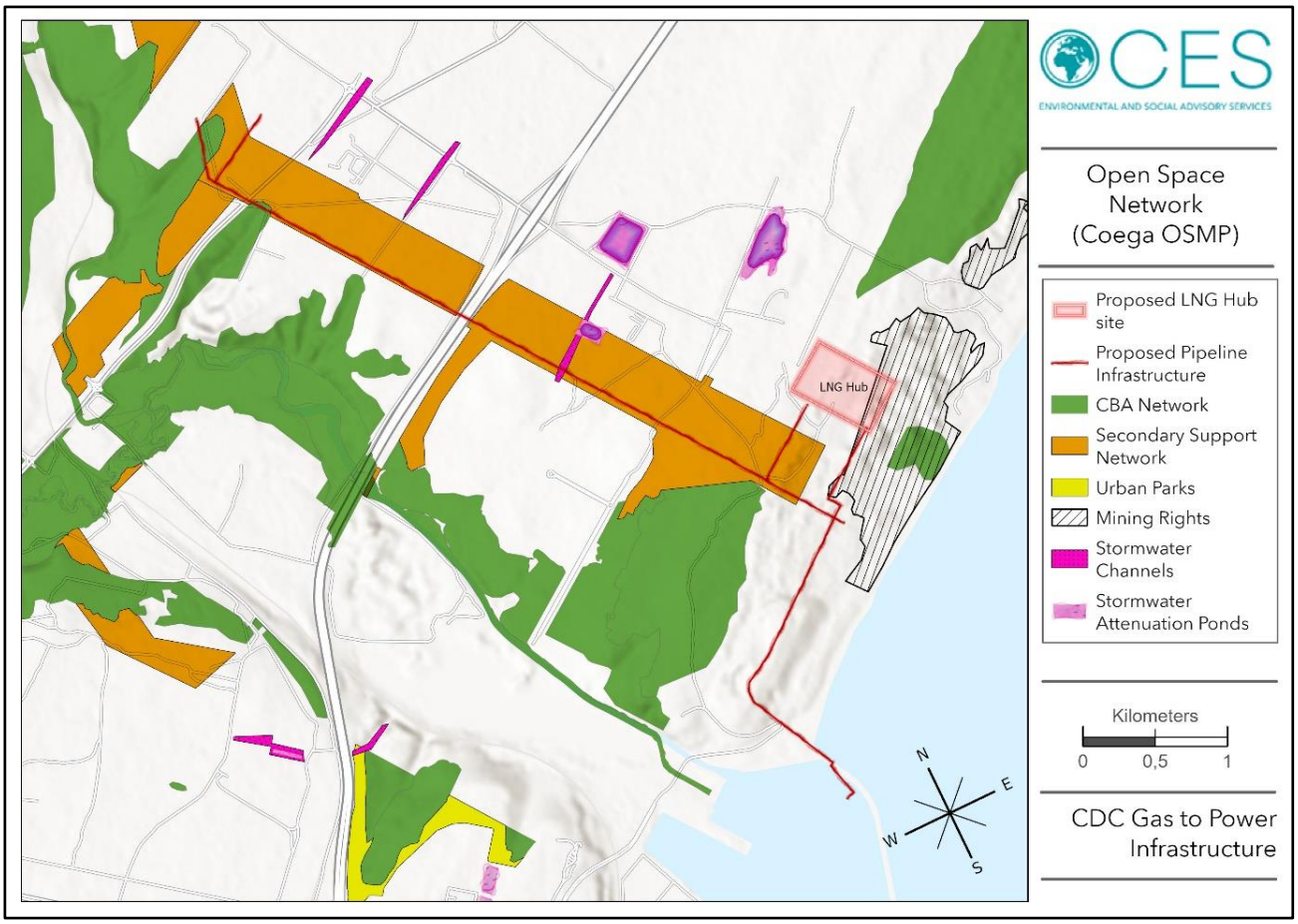


Figure 5-19: Coega OSMP (2014) CBA Network and Secondary Support Network.

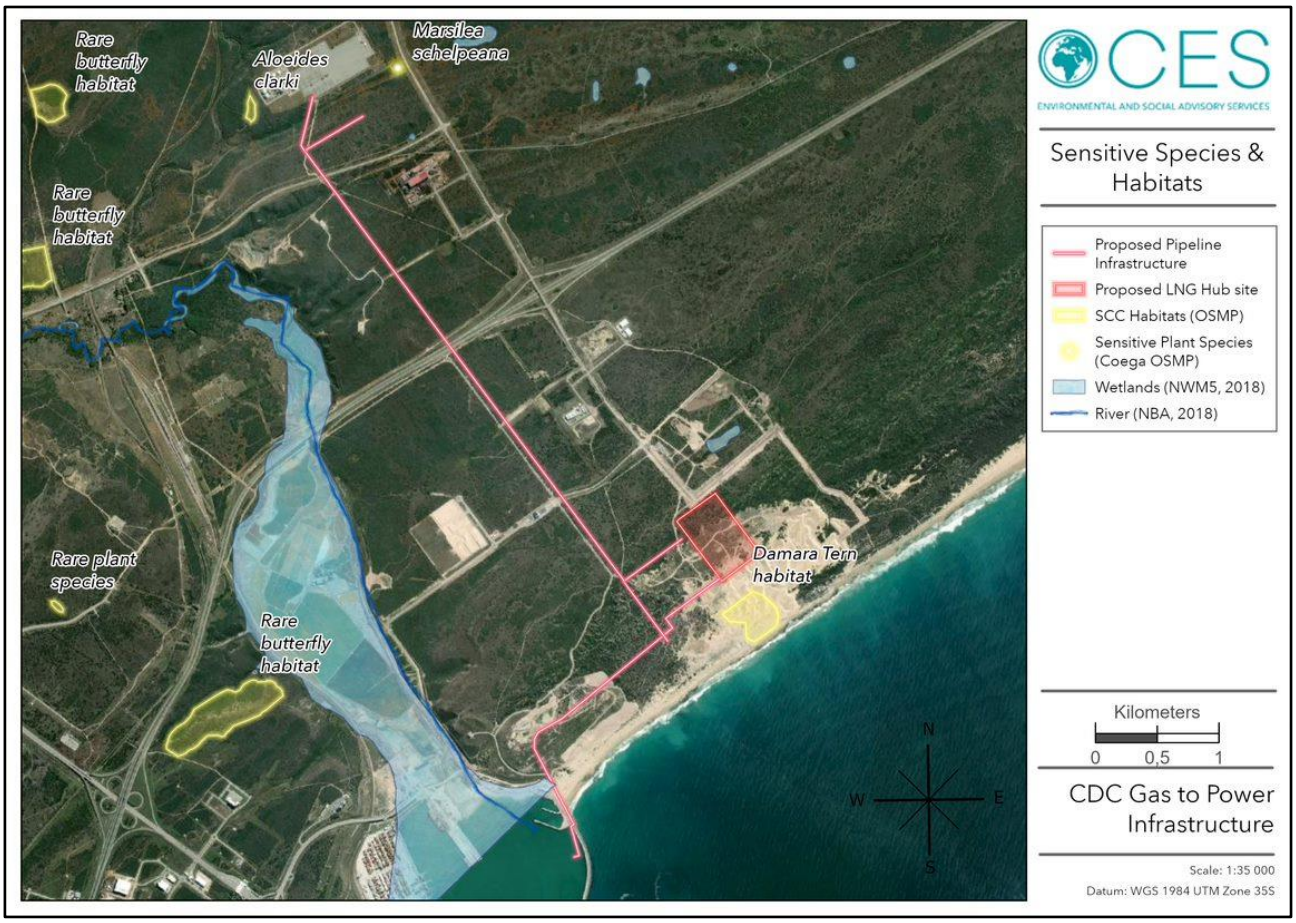


Figure 5-20: Coega OSMP (2014) Species of Special Concern surrounding the project area.

5.5 ADDO ELEPHANT NATIONAL PARK

SANParks initiated a planning process in 2000 to investigate the expansion of the Addo Elephant National Park (AENP), situated in the Eastern Cape, South Africa. The Bird and St. Croix island groups and a small Marine Protected Area around Bird Island, which protects a large variety of marine life, were proclaimed part of the Park in 2005. Bird Island is home the world's largest breeding colony of Cape gannets St Croix Island is home to the largest breeding colony of African penguins.

The Addo Elephant National Park Marine Protected Area, which incorporates the Algoa Bay Islands, was gazetted in May 2019, and is shown in Figure 5-11. Using information from the marine protected areas website (https://www.marineprotectedareas.org.za/addo-elephant-national-park-mpa) and the EBSA Portal (https://cmr.mandela.ac.za/EBSA-Portal), these areas are described below.

This 1,200 km^2 MPA expands on the original Bird Island MPA (comprising Bird, Seal, Stag and Black Rock Islands) to protect sandy beaches, rocky shores, reefs, an estuary and islands, and aid recovery of valuable fisheries resources such as abalone and kob, as well as great white sharks and whales (Bryde's, minke, humpback and right). The MPA protects important feeding areas for the 9,000 pairs of Endangered African penguins breeding at St Croix Island and the 60,000 pairs of Endangered Cape gannets breeding at Bird Island. These islands are the only important seabird islands along a 1,800 km stretch of coastline between Dyer Island near Hermanus in the Western Cape and Inhaca Island in Mozambique. Together with St Croix, Jahleel and Brenton Islands (also in Algoa Bay), they are classed as Important Bird Areas (IBAs) because they regularly support significant numbers of globally threatened bird species and hold large concentrations of seabirds. The islands form ecological distinct subtidal habitats, containing many endemic invertebrates, algae and linefish (e.g. santer and red roman). Black Rocks is an important seal breeding colony and serves as a great

white shark feeding area. The MPA is also of particular importance to the threatened abalone as abalone poaching activities are strictly controlled.

The purpose for declaring this Marine Protected Area is:

- To contribute to a national and global representative system of marine protected areas, by providing protection for species, habitats and ecosystem processes in a biodiversity hotspot, to form a contiguous conservation area between marine, estuarine and terrestrial habitats
- To facilitate fisheries management by protecting spawning stock, allowing stock recovery, enhancing stock abundance in adjacent areas, in particular linefish and abalone stocks; allowing the development of sustainable aquaculture in a confined area
- For the protection of fauna and flora or a particular species of fauna or flora and the physical features on which they depend, including the African penguin and cape gannet

The MPA consists of several Zones with different land use recommendations including restrictions on fishing activities, vessels and recreation activities.

6 ALTERNATIVES

The No-Go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of which alternatives are appropriate needs to be informed by the specific circumstances of the activity and its environment.

Appendix 2 Sections 2 (1) (h) (i) and (x) Appendix 3 Sections 3 (1) (h) (i) and (ix) of the EIA Regulations, 2014 require that S&EIR processes must identify and describe alternatives to the proposed activity that were considered, or motivation for not considering alternatives. Different types or categories of alternatives can be identified, e.g. location alternatives, type of activity, design or layout alternatives, technology alternatives and operational alternatives.

Not all categories of alternatives are applicable to all projects. However, the consideration of alternatives is inherent in the detailed design and the identification of mitigation measures, and therefore, although not specifically assessed, alternatives have been and will be taken into account in the design and S&EIR processes.

The discussion of alternatives in this section aims to demonstrate the process followed during the early planning stages of the Gas to Power project and which have led to the project description as outlined above. It is recognised that this section does not explicitly address the environmental attributes of location alternatives, nor the impacts and risks of each alternative in a comparative format as suggested by Appendix 2 of the EIA regulations. Where decisions on preferred alternatives have been based, or influenced, by environmental considerations, these are mentioned. In the most part, however, considerations have been based on strategic grounds (i.e. the selection of the Port of Ngqura as one of the locations) or technical or financial feasibility.

Depending on the specific project circumstances the following alternatives may be considered:

- Activity Alternatives
- Site Alternatives
- Layout and alignment Alternatives
- Technology
- The No-Go Alternative

6.1 ACTIVITY ALTERNATIVES

No activity alternatives are considered as part of this EIA. The activity of LNG to power generation was selected in response to the ministerial determination (18 February 2020) that 3,000 MW of power be generated from gas and the IRP2019 policy position to support the development of gas infrastructure.. Furthermore, it is assumed that the land use planning for the allocations of the various Zones within the Coega SEZ took various activity alternatives into account in determining the appropriate potential land uses for the project sites. The Gas Infrastructure is required to support the development of large scale gas-fired power generation in the Coega SEZ

6.2 SITE ALTERNATIVES

The feasibility study compiled by Worley Parsons identified the following key considerations in the selection of appropriate sites for the development of Gas Infrastructure:

- Proximity of the site to users (power plants)
- Access to the site from major roads, railways and harbours
- Availability of adequate land and appropriate surrounding land uses, including possible future expansion options
- Land/ground that would require minimal preparation for civil works.

The selection of the proposed site at the Port of Ngqura within the Coega SEZ follows investigations that progressively considered a range of sites at international, national and local levels. This process of site selection is summarised below.

6.2.1 NATIONAL SITE SELECTION PROCESS

Shell investigated various options for locating LNG receiving terminals along the South African coast. Together with the National Ports Authority (NPA), sites were investigated at Saldanha Bay, Cape Town, Mossel Bay, Port Elizabeth and Coega. The Shell investigation concluded that Coega was the most viable option for locating a LNG receiving terminal, and approached the national utility Eskom and national gas infrastructure company iGas to evaluate the pre-feasibility of a project to develop LNG receiving and regasification facilities, and a gas pipeline infrastructure at Coega, premised on the development of a CCGT power plant.

6.2.1.1 Identification of terminal/berthing locations within the Port of Ngqura

An over-arching constraint was that the location of the berth must not constrain other activities in the port nor the planned future expansion of the port both inland into the area of the saltworks (second phase) and south-westwards (third phase). Safety requirements for the berth and activities are also of prime importance when selecting the berth locations. Furthermore, LNG is recirculated through the unloading pipelines to keep the cryogenic line cold, i.e. product remains in the line at all times. This means that safety zones around the jetty are also applicable when the LNGC is not at berth.

As part of the site screening studies (PRDW, 2015a), seven preliminary sites were identified. Each of the sites were identified with due consideration of the functional requirements and the local port constraints. During the initial stages of the site selection process, two main site constraints were identified, the future short term developments, and the existing cargo handling areas. In the process of identification of the preliminary sites, the existing cargo facilities and the future short term developments were avoided.

The seven preliminary sites which were assessed in the multi-criteria analysis (MCA) are shown below in Figure 6-1 to Figure 6-4 (PRDW, 2016). Site 1 and 2 represent onshore regasification facilities. Sites 3, 4 and

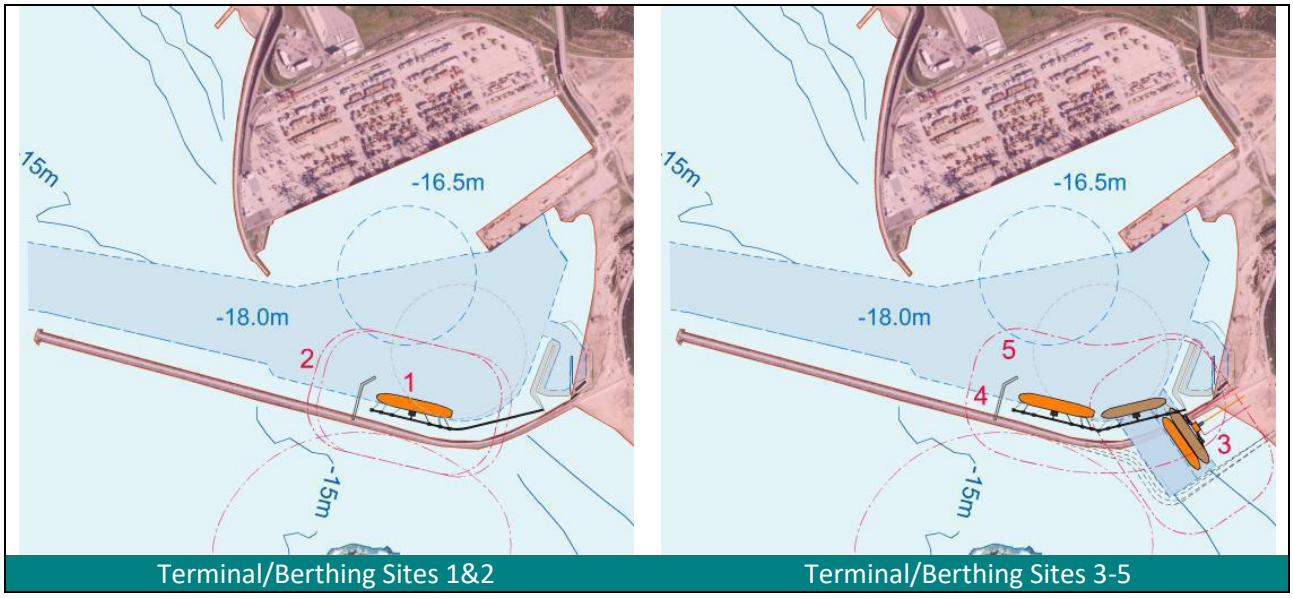
5 accommodate FSRUs. Sites 6 and 7 are a yoke mooring and offshore sea island respectively. Sites 1 and 2 and Sites 4 and 5 are only distinguished from each other by the presence of a small stub breakwater intended to lower the risk of incoming vessels colliding with a vessel at the berth.

The selection of the preferred sites and layouts followed a staged process which included input from TNPA and numerous PRDW discipline leads. TNPA was represented across various disciplines which included planning, engineering, regulatory and oversight, port operations and environmental. The site selection developed over two working sessions which culminated in a site selection workshop.

In order to identify the preferred LNG site location a site selection workshop was held, with TNPA, on 29 July 2015. The criteria used in the MCA are briefly described in Table 6-1 below:

Table 6-1: Site selection criteria descriptions (PRDW, 2016)

Main Criteria	Criteria Description
Environmental and statutory approvals	Evaluating the perceived difficulty of attaining the Environmental Impact Assessment, permits and plans, and land acquisition and servitudes.
Port operations - effect on status quo	Effect on current port operations with respect to navigation of other vessels and general port functionality.
Future developmental potential	Conformity to future plans, effects on future port development and potential scalability and reversibility of the terminal.
Safety risk	Adherence to marine and land safety distances.
Capital cost evaluation	Relative cost comparison based on an order of magnitude capital cost estimate (heavy marine infrastructure only).
Implementation schedule	Estimate of implementation schedule i.e. duration to start-up of operations.



Terminal/Berthing Sites 1&2 | Terminal/Berthing Sites 3-5

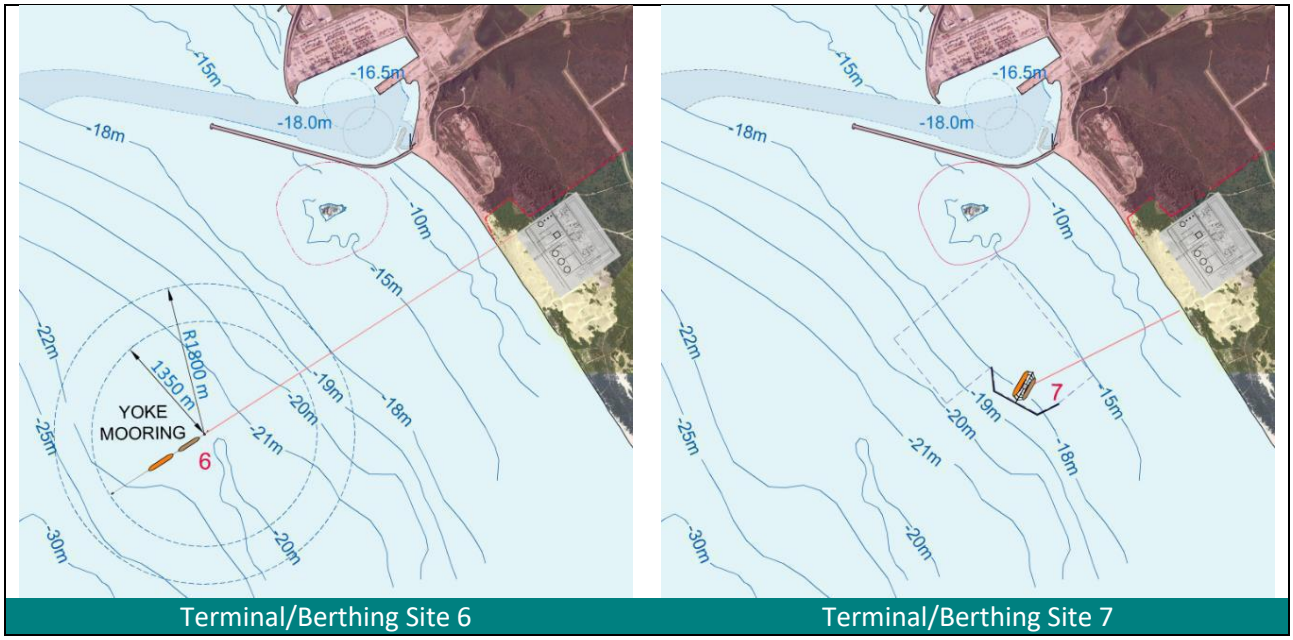


Figure 6-1: Site alternatives identified for the terminal/berthing locations

The following outcomes were reached:

- LNG carrier solutions (options 1 and 2) were not selected, as they are configured for land-based LNG regasification. The time required to construct the storage tanks on land is extensive and the overall build schedule would not meet the time-lines required for the IPPPP
- Option 3 was preferred from a navigation perspective while Options 4 and 5 were preferred from a capital cost perspective
- Options 4 and 5 are essentially the same option and further ship manoeuvring studies were required to determine the suitability of this alternative from a navigational safety perspective and whether or not a stub breakwater would be required
- Option 3 will be the preferred site should Options 4 and 5 not be feasible
- Site 6 and 7 were generally the lowest scoring options and were therefore not preferred.

Options 3, 4 and 5 were considered as the preferred options. The navigation assessment subsequent to the selection process, resulted in a further refinement of options 4 and 5. The navigation assessment indicated that the stub breakwater and second, seaward berth would compromise the safety of sailing vessels. The study did, however, demonstrate that there was sufficient space for a single berth in the vicinity of the new ACB, in a double-banked configuration. Options 4 and 5 were therefore adapted to a single berth, double-banked configuration as shown in Figure 6-6.

Following these initial studies, two technically preferred site layouts were identified for the development of LNG import facilities at Coega. The second option known as Layout 2 (Dig-out-basin), is located seaward of the existing eastern breakwater in a new dig-out basin as earmarked in the 2015 Transnet Port Development Framework Plan for the dedicated purposes of LNG. Both terminal options are shown below in Figure 6-5. The layout would require demolition of a section of the breakwater, dredging of a basin, and construction of the berth and access causeway.

The capital cost for Layout 1 (FSRU) was estimated to be R0.91 billion, of which the most significant cost element would be for the quay structure. The capital cost for Layout 2 was estimated to be R4.35 billion, of which the most significant cost elements would be for the rerouting of the breakwater and the capital dredging (PRDW, 2016). Following a cost-benefit analysis undertaken by the IPP Office Layout 1 was selected as the preferred option.

It is noted that the existing Environmental Authorisation for the development for the port states that no infrastructure may be constructed along the eastern breakwater (due to the risk of rodents from ships and associated activities invading the nearby Jahleel Island). Layout 1 (as illustrated in Figure 6-2) therefore deliberately avoids locating access routes or pipelines on the existing breakwater for the offshore regasification/FSRU phase of the development.

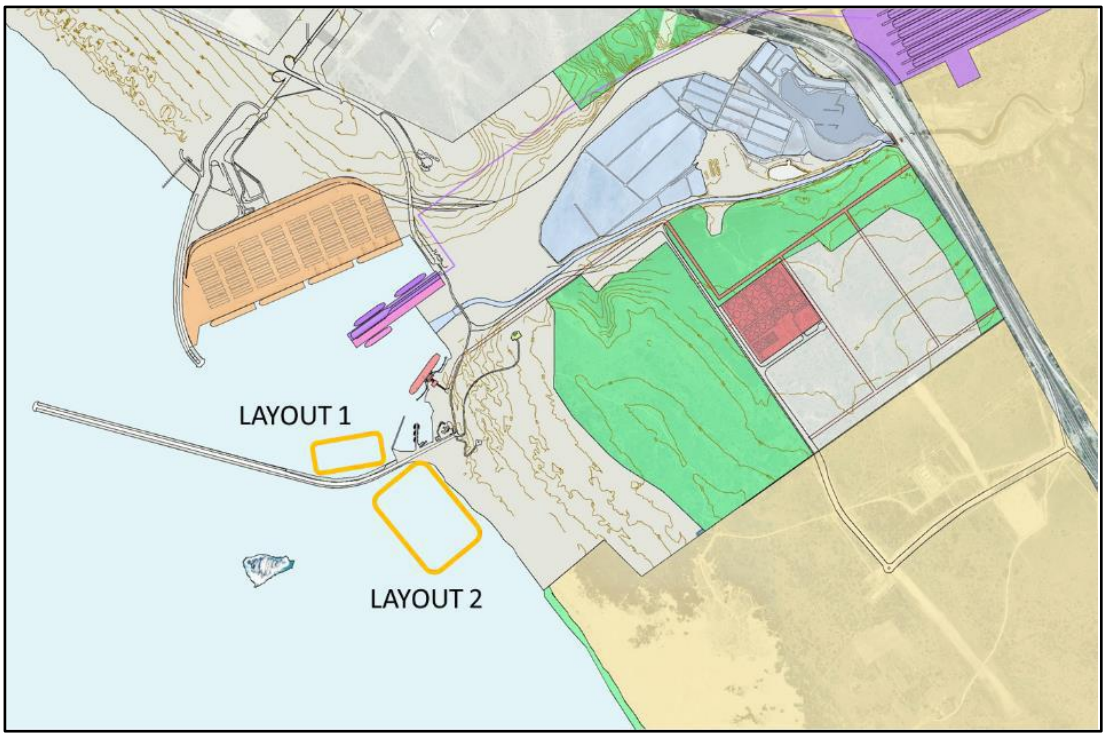


Figure 6-2: Locality map showing the two layout alternatives that were considered for the FSRU (PRDW, 2016)

6.3 LAYOUT AND ALIGNMENT ALTERNATIVES

The gas pipeline from the FSRU, which would probably be developed initially, and then the cryogenic pipeline for the bulk transportation of LNG from the berth to the land-based storage and regasification facility would follow the alignment proposed in the feasibility studies, which are informed by cost and safety considerations and are indicated on the layout plans (Appendix I and Figure 1-3). No alternative corridors for these pipelines are proposed.

The land-based storage and regasification facility will require seawater intake and discharge pipelines, and associated infrastructure (e.g. pump houses). These components of the gas infrastructure are included in the assessment and subsequent authorisation of the Coega SEZ Marine Pipeline Servitude and the consideration of these alignment alternatives is therefore outside the scope of this EIA process.

Four LNG terminal development options were considered during a feasibility study that pre-dated this EIA process. The feasibility study concluded that a terminal that could accommodate a FSRU, with provision to convert the terminal to supply LNG to a land-based regasification facility in the future, was the most feasible option. The proposed development is therefore split into two phases with the development of a jetty capable of accommodating developmental options identified for the preferred site are:

- **Option 1**: A floating LNG import terminal (FSRU) with no provision for future expansion or conversion, refer Figure 6-3;
- **Option 2**: A floating LNG import terminal (FSRU) with provision to convert the terminal to supply LNG to a land-based regasification facility in the future, refer Figure 6-4. This is the technically preferred option and is proposed in this application;

- **Option 3**: A floating LNG import terminal (FSRU) with future construction of a new conventional LNG import terminal to supply LNG directly to a land-based regasification facility, with provision to convert the floating terminal to import other liquid bulk products, e.g. LPG, refer Figure 6-5
- **Option 4**: A conventional land-based LNG import terminal with no provision for future expansion or conversion, refer Figure 6-6.

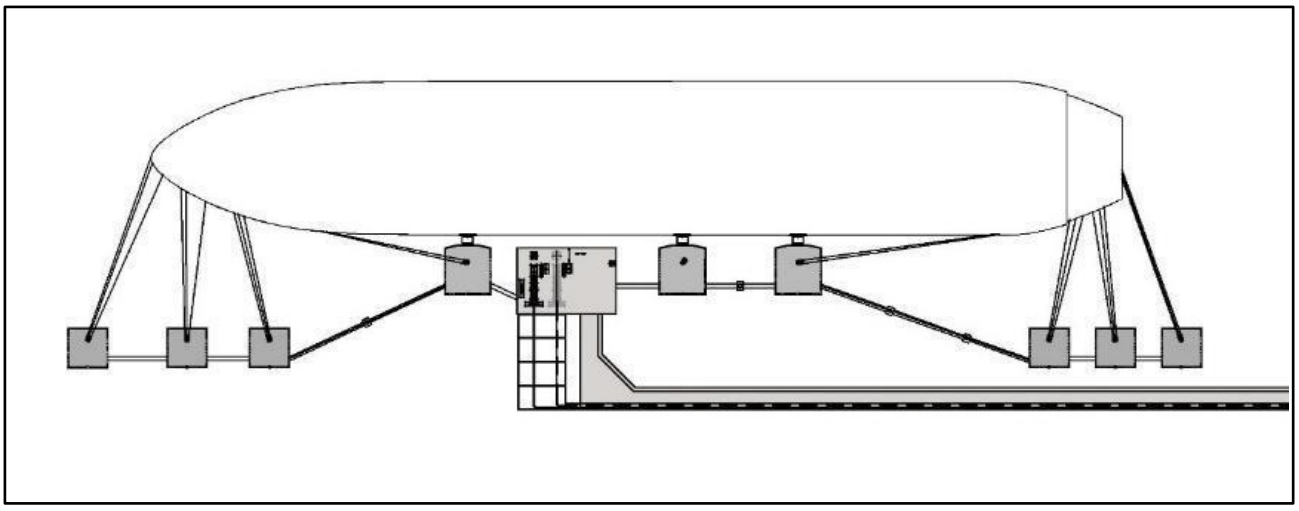


Figure 6-3: Option 1 – FSRU berth only (Source: (PRDW, 2016)

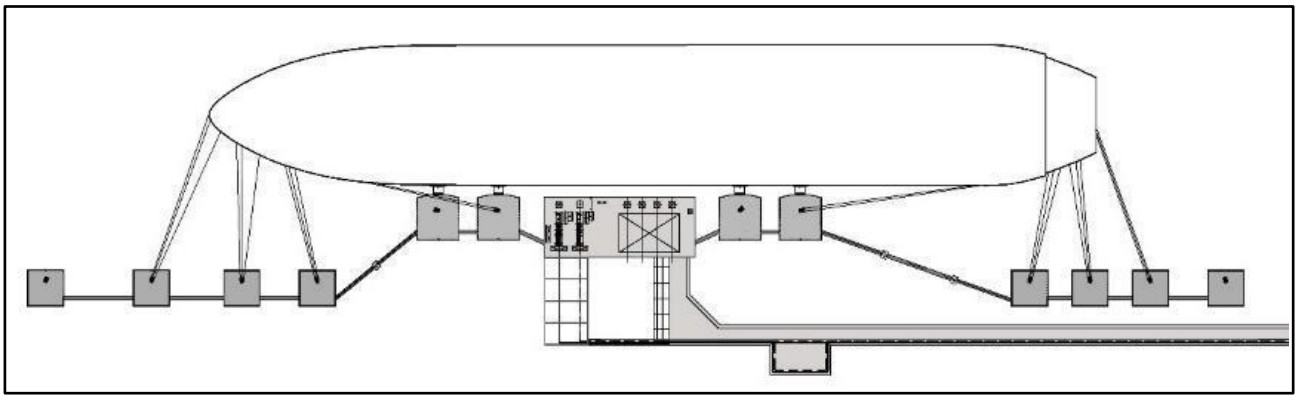


Figure 6-4: Option 2 – FRU berth convertible to LNG (Source: (PRDW, 2016)

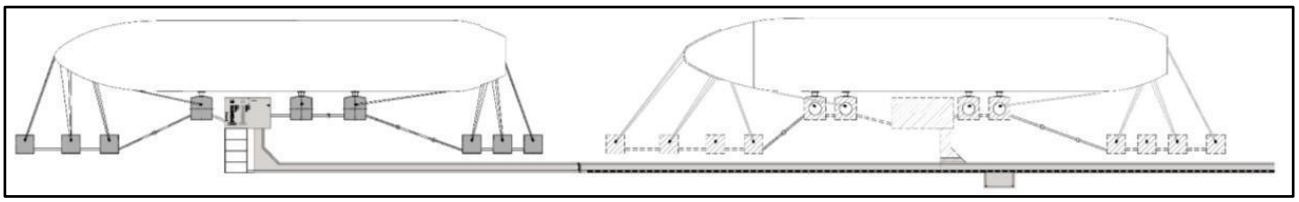


Figure 6-5: Option 3 – FSRU berth only with provision for future LNG berth (Source: (PRDW, 2016)

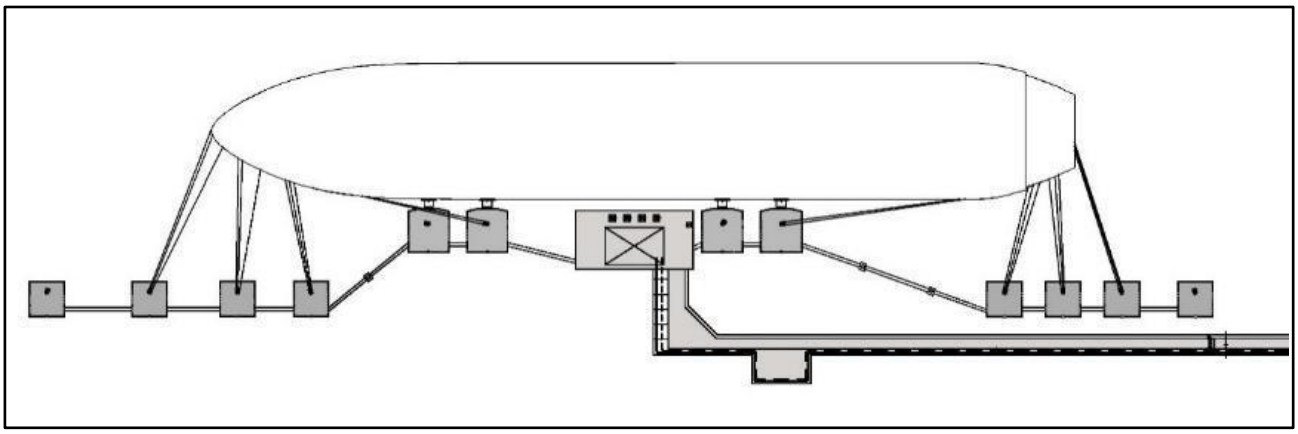


Figure 6-6: Option 4: LNG only berth (Source: (PRDW, 2016)

A workshop was held with TNPA on 10 December 2015, in order to identify the preferred development option. The criteria used in the MCA are presented in Table 6-2 below:

Table 6-2: Criteria used in MCA

Main Criteria	Sub-criteria
Implementation	Upfront capital cost of port infrastructure
	Speed of implementation (time to production of first gas)
Scalability	Potential to increase throughput (of same product)
	Capital cost of throughput increase
	Risk of disruption to gas supply during upgrade
Future developmental potential	Flexibility of the terminal (to upgrade to LNG)
	Long-term throughput potential (LNG)
	Reversibility (ability to export LNG)

The MCA identified Option 2 (FSRU berth convertible to LNG berth) as the preferred development option followed closely by Option 3 (FSRU only berth with provision for future LNG berth). A sensitivity analysis on the criteria weighting was performed to test the outcomes of the MCA. The sensitivity analysis on the evaluation criteria weightings indicated that Option 2 scored consistently well across all weighting alternatives. It was therefore agreed that, based on TNPA's requirements (PRDW, 2015b), Option 2 (FSRU berth convertible to LNG berth) was the preferred terminal development option.

6.4 No-Go Alternative

The no development option assumes the gas infrastructure as proposed would not be developed and the sites allocated within the port (for the FSRU) and Zone 10 of the SEZ (for the LNG and gas hub) would remain undeveloped whereby no jobs are created during the construction and operational phases. The lack of gas infrastructure in the Coega SEZ may also limit the development of gas fired power plants in the SEZ, as alternative plans for supply of natural gas to the power plant would be required in the absence of piped gas supply, adding to the cost and logistical challenges of such development.

Should the development proposal not take place, there would be no social and/ or economic benefits to society resulting from the project, both directly and indirectly (through limitation on gas fired power plants in the area) and the current trajectory of increasing unemployment, lack of energy security and little or no economic growth is likely to continue. The absence of a positive impact for job creation and GDP, as described in this report, is not a negative impact, and so the No-Go option would not result in a different impact (merely the absence of these two positive impacts). In terms of contribution to increased energy security, it is assumed that even if this project is not authorised, a similar project elsewhere would be authorised. Consequently, in terms of energy security, the No-Go option would also result in the absence of a positive impact from this project, and not a continued negative impact due to the load shedding, etc.

The No-Go alternative will be used as a baseline throughout the assessment process against which potential impacts will be compared and will be assessed in the EIR.

7 KEY FINDINGS OF THE SPECIALIST STUDIES

Appropriately qualified and experienced specialists were appointed to undertake the various assessments identified as being necessary. Specialists gathered baseline information relevant to the study and assessed impacts associated with the proposed Coega Gas Infrastructure. Specialists have also made recommendations to mitigate negative impacts and enhance benefits. The resulting information has been synthesised in the section below, whilst the full specialist reports have been attached to the EIR as a Specialist Report section in Appendix D.

The following Specialist Studies have been completed for the EIA Phase–

Table 7-1: Specialist Assessments used in Draft EIR

Study	Specialist	Appendix
Air Quality Impact Assessment	Dr Mark Zunckel Umoya-Nilu	Appendix K1
Quantitative Risk Assessment	Mike Oberholzer, Riscom	Appendix K2
Climate Change Impact Assessment	Karien Erasmus, Promethium Carbon	Appendix K3
Noise Impact Assessment	Dr Brett Williams, Safetech	Appendix K4
Traffic Impact Assessment	Cary Hastie, EAS	Appendix K5
Marine Impact Assessment	Andrea Pulfrich, Pisces	Appendix K6
Ecological Impact Assessment	Dr Ted Avis, CES	Appendix K7
Avifauna Specialist Assessment	Dr Paul Martin, Acoustech	Appendix K8

7.1 AIR QUALITY IMPACT ASSESSMENT

STUDY	**Air Quality Impact Assessment**
SPECIALIST	**Dr Mark Zunckel**
COMPANY	**Umoya-Nilu**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix E**

7.1.1 CONCLUSION & SPECIALIST STATEMENT

An air quality assessment for the proposed Land-based LNG Terminal and Gas Infrastructure Project has been conducted. The requirements of the Atmospheric Impact Report (AIR) have been adhered to and the methodology followed the regulatory requirement for dispersion modelling studies. LNG is a clean fuel. The predicted ambient concentrations of SO_2, NO_2, PM_{10} and CO resulting from emissions from the Land based LNG Terminal and Gas Infrastructure Project are therefore very low. The significance rating for the air quality impacts is insignificant for all pollutants.

Ambient monitoring and dispersion modelling show that ambient concentrations of SO_2 and NO_2 in the Coega SEZ are generally low, but there are some areas where NO_2 exceedances occur. PM_{10} concentrations are relatively high and exceedances of ambient standards were modelled from baseline emission data. The cumulative effect of the proposed operation will be negligible.

The predicted ambient concentrations resulting from the emissions from the CDC project (three 1 000 MW power plants and the gas infrastructure project) are very low and the intensity is rated as low for NO_2 and

irrelevant for the other pollutants. It is highly unlikely that they will contribute to exceedances of the ambient standards.

The cumulative effect of the CDC project will be very small or negligible. The cumulative effect of the gas-to-power projects is also predicted to be very small or negligible. The predicted ambient concentrations resulting from the power plant emissions are very low and the intensity is rated as low for NO_2 and irrelevant for the other pollutants. It is highly unlikely that they will contribute to exceedances of the ambient standards.

7.1.2 Impacts

- Degradation of Air Quality.

7.1.3 Mitigation Measures

Air quality management interventions to reduce emissions are deemed to be unnecessary considering the low impact of the project on air quality. Routine emission measurements and other air quality monitoring may be stipulated by the Licensing Authority in the Atmospheric Emission License (AEL).

7.2 Quantitative Risk Assessment

STUDY	**Quantitative Risk Assessment**
SPECIALIST	**Mr Mike Oberholzer**
COMPANY	**RISCOM**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix E**

7.2.1 Conclusion & Specialist Statement

This risk assessment included the consequences of fires and explosions at the proposed Gas Infrastructure in the Coega SEZ. A number of well-known sources of incident data were consulted and applied to determine the likelihood of an incident to occur.

Methane (compressed) is listed as a notifiable substance at a threshold value of 15 t. The schedule does not specifically mention LNG. Furthermore, the storage of LNG would be in the liquid state and not compressed. To this end LNG would not be classified as a notifiable substance.

However, if the design changes so that more than 15 t of compressed natural gas (CNG) would be contained in a single container, the CNG would be classified as a notifiable substance and the facility would automatically be classified as a Major Hazard Installation.

RISCOM did not find any fatal flaws that would prevent the project proceeding to the detailed engineering phase of the project.

RISCOM would support the project with the following conditions:

- Compliance with all statutory requirements, i.e., pressure vessel designs
- Compliance with applicable SANS codes, i.e., SANS 10087, SANS 10089, SANS 10108, etc.
- Incorporation of applicable guidelines or equivalent international recognised codes of good design and practice into the designs

- Completion of a recognised process hazard analysis (such as a HAZOP study, FMEA, etc.) on the proposed facility prior to construction to ensure design and operational hazards have been identified and adequate mitigation put in place
- Full compliance with IEC 61508 and IEC 61511 (Safety Instrument Systems) standards or equivalent to ensure that adequate protective instrumentation is included in the design and would remain valid for the full life cycle of the tank farm:
    - Including demonstration from the designer that sufficient and reliable instrumentation would be specified and installed at the facility;
- Preparation and issue of a safety document detailing safety and design features reducing the impacts from fires, explosions and flammable atmospheres to the MHI assessment body at the time of the MHI assessment:
    - Including compliance to statutory laws, applicable codes and standards and world's best practice;
    - Including the listing of statutory and non-statutory inspections, giving frequency of inspections;
    - Including the auditing of the built facility against the safety document;
    - Noting that codes such as IEC 61511 can be used to achieve these requirements;
- Demonstration by the CDC or their contractor that the final designs would reduce the risks posed by the installation to internationally acceptable guidelines;
- Signature of all terminal designs by a professional engineer registered in South Africa in accordance with the Professional Engineers Act, who takes responsibility for suitable designs;
- Completion of an emergency preparedness and response document for on-site and off-site scenarios prior to initiating the MHI risk assessment (with input from local authorities);
- Permission not being granted for increases to the product list or product inventories without redoing part of or the full EIA;
- Final acceptance of the facility risks with an MHI risk assessment that must be completed in accordance with the MHI regulations, basing such a risk assessment on the final design and including engineering mitigation.

7.2.2 IMPACTS

Phase 1 (FSRU – Offshore Storage):

- Loss of containment resulting in fires and explosions (LNG Carrier)
- Loss of containment resulting in fires and explosions (FSRU)
- Loss of containment resulting in fires and explosions (Regassification and Compression)
- Loss of containment resulting in fires and explosions (LNG Pipeline Failure)
- Loss of containment resulting in fires and explosions (CNG Pipeline Failure)
- Loss of containment resulting in fires and explosions (Road loading)

Phase 2 (LNG Hub – Onshore Storage):

- Loss of containment resulting in fires and explosions (LNG Carrier)
- Loss of containment resulting in fires and explosions (Onshore Storage)
- Loss of containment resulting in fires and explosions (Regassification and Compression)
- Loss of containment resulting in fires and explosions (LNG Pipeline Failure)
- Loss of containment resulting in fires and explosions (CNG Pipeline Failure)
- Loss of containment resulting in fires and explosions (Road loading)

7.2.3 MITIGATION MEASURES

- Installation and maintenance of monitoring instrumentation including detection and emergency shut-down facilities.

7.3 CLIMATE CHANGE IMPACT ASSESSMENT

STUDY	Climate Change Impact Assessment
SPECIALIST	Ms Karien Erasmus
COMPANY	Promethium Carbon
QUALIFICATIONS	Specialist Declaration and CV, Appendix E

7.3.1 CONCLUSION & SPECIALIST STATEMENT

The proposed Gas Distribution Infrastructure will have several positive and negative impacts. It is important to remain cognisant of some negative aspects of the Gas Distribution Infrastructure. These are that:

- The Gas Distribution Infrastructure does release GHG emissions that will need to be mitigated where possible.
- The project does contribute to climate change and can exacerbate the climate vulnerability of local communities.
- There are several conditions that should be met prior to commencing with construction, including:
    - The designs of infrastructure and processes should consider the potential impact of extreme weather events such as severe storms/storm surge;
    - The designs for the piping should account for increasing ambient temperatures as well as an increased frequency of very hot days and the associated material fatigue; and
    - Safety protocols should take into consideration the impacts of climate change on construction and operations. This includes the introduction of disaster management policies, as well as onsite employee training, specifically for risk management of extreme weather events.

However, it is also important to consider the benefits. Most notably among those are the following:

- The Gas Distribution Infrastructure acts as an enabler for a wider use of natural gas within South Africa's economy, especially for power generation. Natural gas is significantly less emission intensive than coal, which will reduce the emission intensity of the national grid, and other combustion related activities, such as for heaters, boilers, furnaces, and similar processes. Compared to coal, the emissions from natural gas also contain significantly less harmful products and a negligible amount of ash.
- The use of natural gas as a fuel source for electricity generation significantly improves the ability of South Africa's National Grid to incorporate more intermittent renewable energy sources, such as wind and solar. Currently, South Africa's national grid can realistically only draw a small portion of its power from these renewable energy sources, as it is mainly driven by coal-fired power stations. If natural gas were to underpin the national grid as the main fuel, then most of the national grid's power can be drawn from intermittent renewable energy sources.
- In future, the Gas Distribution Infrastructure could also be repurposed for the distribution of biogas or biomethane, further reducing the amount of emissions generated.
- On a national scale, the Gas Distribution Infrastructure could lead to a potential emission saving of 295 million tCO2e across the lifetime of the project. This is relative to using coal as a fuel source as a baseline.

It is the specialists opinion that the proposed Gas Distribution Infrastructure should be authorised.

7.3.2 IMPACTS

- Project contribution to climate change

- Risk and Vulnerability of the Project to Climate Change

7.3.3 MITIGATION MEASURES

Mitigation measures recommended for the impact of the project contribution to climate change include:

- The LNG to be sourced from nearby suppliers, to reduce upstream transport emissions.
- The LNG to be sourced from responsible suppliers, reducing emissions associated with extraction and upstream processing of the LNG.
- Use of good quality equipment to reduce the amount of LNG that vaporizes and escapes as fugitive emissions.

The impact of these mitigation measures is however insignificant relative to the overall impact of the project. There are no effective mitigation measures that will significantly reduce the overall GHG emissions of the project and resultant impact on climate change.

Mitigation measures recommended for the impact of climate change on the proposed infrastructure includes:

- The designs of infrastructure and processes must consider the potential impact of extreme weather events such as severe storms/storm surge, severe winds, extreme heat, heavy rains, and flooding impacts. The corrosive nature of maritime climate on infrastructure and equipment must be taken into account in design and maintenance;
- The designs for the piping must account for increasing ambient temperatures as well as an increased frequency of very hot days and the associated material fatigue;
- Safety protocols must take into consideration the impacts of climate change on construction and operations. This includes the introduction of disaster management policies, as well as onsite employee training, specifically for risk management of extreme weather events.
- Design of an on-site stormwater drainage system, and implementation of a stormwater management plan.
- Improve storm water drainage capacity to minimise flood occurrences onsite and the associated contamination occurrences.
- Use a closed-loop water system for the Gas Infrastructure to minimise water losses to evaporation, and reduce water consumption.

7.4 NOISE IMPACT ASSESSMENT

STUDY	Noise Impact Assessment
SPECIALISTS	Dr Brett Williams
COMPANY	Safetech
QUALIFICATIONS	Specialist Declaration and CV, Appendix E

7.4.1 CONCLUSION & SPECIALIST STATEMENT

The results of the noise impact assessment of the proposed Gas Infrastructure related to the proposed Gas to Power development within the Coega SEZ show that at all the terrestrial receptors the SANS 10103:2008 rating limits will not be exceeded. However, when considering the cumulative impacts of all components of the proposed development, the limits may be exceeded at the Damara Tern Colony at Noise Sensitive Area (NSA) 10.

The following is highly recommended:

- The noise impacts are re-modelled when the final supplier of equipment and plant design is chosen. This will enable additional noise mitigation measures to be determined before the equipment is finally procured.
- Periodic noise measurements are to be taken during the construction and operational phases.
- A long-term hydrophone system is installed in the vicinity of the FSRU and LNGC berth and the harbour entrance to determine the current underwater noise climate.

7.4.2 IMPACTS

- Noise affecting nearby receptors during construction
- Noise affecting nearby receptors during operation

7.4.3 MITIGATION MEASURES

The following mitigation measures are recommended for the construction phase:

- All construction operations should only occur during daylight hours if possible.
- No construction piling should occur at night where possible. Piling should only occur during the day to take advantage of unstable atmospheric conditions.
- Construction staff should receive “noise sensitivity” training such as switching off vehicles when not in use, location of NSA’s etc.
- An ambient noise survey should be conducted at the noise sensitive receptors during the construction phase.

The following mitigation measures are recommended for the operational phase:

- The noise impact from the Gas Infrastructure should be measured during the operational phase, to ensure that the impact is within the required legal limit.

7.5 TRAFFIC IMPACT ASSESSMENT

STUDY	**Traffic Impact Assessment**
SPECIALIST	**Mr Cary Hastie**
COMPANY	**EAS**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix E**

7.5.1 CONCLUSION & SPECIALIST STATEMENT

The following potential traffic related impacts relating to the proposed Gas Infrastructure have been identified. Note that the impacts will occur both in the short-term (i.e. during the construction phase) and medium to long-term once the plant is completed (operational phase):

- Road Capacity - Additional vehicle trips generated by the proposed development (up to 323 and 34 additional trips during the AM and PM peak hours for the construction and operational scenarios respectively) will have minimal impact in terms of road capacity given the current low hourly volumes along the road links and at the affected intersections, and low trips generated by the proposed power plant.
- Road Pavement - The Coega IDZ Demand Modelling Report indicates that all Class 2 roads would likely need to accommodate 7.5 million E80s per lane over a 20-year period. Given that the Ring Road is a class 2 road it has likely been designed for these volumes. As such the number of E80s generated by the power plant traffic relative to the maximum expected loading over the 20-year period is minimal. Similarly, the cumulative impact of all other known power plants will not impact significantly on the road pavements as their design has taken such volumes into account.
- Traffic Safety - Safety issues may initially be a concern given low traffic volumes as traffic is likely to operate at high speeds in low traffic environments.

The following conclusions can be drawn from the study:

- Access to the proposed development can be provided directly from an Extension of the Ring Road from the existing roundabout;
- The development generates approximately 323 AM and PM peak hour trips during the Construction Phase which equates to approximately 13 % of projected peak hour volumes on Ring Road, although these vehicle trips are only during the construction phase it is important to note that there is plenty of spare capacity on Ring Road;
- The development generates 29 AM and PM peak hour trips during the Operational Phase which equates to approximately 1.2 % of projected peak hour volumes on Ring Road;
- The existing roads have been designed to accommodate traffic generated by the full SEZ development;
- No impact is expected provided that all heavy vehicle loading is within legislated limits;
- During full utilization capacity analysis indicates that no capacity concerns are realized; and
- Capacity analysis indicates that the affected junctions operate at high LOS for the construction scenario and with the Liquified Natural Gas terminal and distribution facility and both power plants as well as the ENGIE [Mulilo] Zone 13 power plant and Karpowership operational.

7.5.2 IMPACTS

The following impacts were identified in the Traffic Impact Assessment:

- Increased traffic volumes, affecting traffic flow during construction
- Additional Axle Loading resulting in deterioration of road condition during construction
- Traffic Safety Impact due to additional / high-speed traffic during construction

7.5.3 Mitigation Measures

The following recommendations are included in the Traffic Impact Assessment for the construction period include:

- Provide suitable traffic accommodation measures as part of construction contract to inform other road users of presence of construction related traffic
- Traffic accommodation measures to be provided in terms of Chapter 13 of the South African Road Traffic Signs Manual
- Measures to be provided subject to approval by the Engineer
- Ensure construction traffic is confined to site area where possible
- Minimise need for continuous construction traffic on Ring Road by confining construction traffic to the site
- Ensure that vehicle loads are within legislated limits, i.e. maximum Gross vehicle mass of 56 000kg
- Source relevant permits from the Eastern Cape Department of Transport should abnormal loads be required for transport of components
- Provide suitable traffic accommodation measures as part of construction contract to inform other road users of presence of construction related traffic, including speed restriction signage
- Increased law enforcement protocols

The following recommendations are included in the Traffic Impact Assessment for the operational period include:

- Suitable warning traffic signage be provided to ensure safe operation along access roads;
- Ongoing enforcement along access roads

7.6 Marine Impact Assessment

STUDY	**Marine Impact Assessment**
SPECIALIST	**Dr Andrea Pulfrich**
COMPANY	**Pisces Environmental Services**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix E**

7.6.1 Conclusion & Specialist Statement

The impact assessment identified that the marine environment will be impacted to some degree during the construction and operational phases of the proposed Coega LNG terminal. With the exception of the creation of artificial hard substrata, which can be considered a positive impact, all other impacts were rated as negative.

Anthropogenic activities in the coastal zone can result in complex immediate and indirect effects on the natural environment. Effects from disparate activities can combine and interact with each other in time and space to cause incremental or cumulative effects. Cumulative effects can also be defined as the total impact that a series of developments (both disparate and similar), either present, past or future, will have on the environment within a specific region over a particular period of time.

To define the level of cumulative impact in the intertidal and subtidal environment within the Port of Ngqura, it is therefore necessary to look beyond the environmental impacts of the current project and consider also the influence of other past, current or future developments in the area, relating both to further port developments as well as other gas-to-power developments within and around the Port of Ngqura as part of the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP).

Cumulative impacts would relate specifically to:

- Changes in habitat due to construction of quays, breakwaters, underwater revetments, jetties and mooring and berthing dolphins or placement of mooring legs
- Compromised water quality due to capital and maintenance dredging, operational discharges from ships within the port and waste water discharges into the port via the Coega River
- Physiological effects on marine fauna of thermal discharges
- Increased background anthropogenic noise levels
- Compromised sediment quality within the port in response to increased port development and other anthropogenic sources in the Coega Special Economic Zone
- Increased introductions of non-native species on vessel hulls and in ballast water
- Impingement and entrainment effects of multiple seawater intakes within the port.

Cumulative effects on the marine ecology in response to the proposed development are thus highly likely

Other than the unplanned event of a vessel accident or the release of large volumes of diesel into the marine environment, the impacts of MEDIUM significance relate primarily to short-term construction impacts, the introduction and spread of non-native marine species and impingement and entrainment effects resulting from the intake of large volumes of seawater from the Port for the purposes of re-gasification, cooling and ballasting. Whereas the introduction of non-native marine species is a cosmopolitan problem in all ports, the intake of large volumes of water from a relatively confined and sheltered waterbody such as a port warrants further consideration, especially when the port has been identified as supporting one of the most abundant and diverse fish populations along the South African coastline, and functioning as an important habitat for both juvenile and adult fish many of which are considered 'vulnerable', 'endangered' and 'critically endangered'.

7.6.2 IMPACTS

The following impacts were raised in the Marine Impact Assessment Report. For additional information please refer to Chapter 9 of this report and Chapter 9 of the Noise Report.

- Elimination of benthic communities through disturbance and loss of substratum
- Reduced physiological functioning of marine organisms due to increased suspended sediment concentrations or turbidity
- Toxic effects of remobilised contaminants and nutrients in the dredge and construction area on marine organisms
- Disturbance, behavioural changes and avoidance of feeding and/or breeding areas in fish, seabirds, seals, turtles and cetaceans due to underwater noise generated by dredging and general construction
- Disturbance, behavioural changes and avoidance of feeding and/or breeding areas in fish, seabirds, se
- als, turtles and cetaceans due to underwater noise from the LNGCs and FSR
- Disturbance, behavioural changes and avoidance of feeding and/or breeding areas in fish seabirds, seals, turtles and cetaceans due to pile driving, underwater drilling and hydraulic rock breaking
- Creation of Artificial Hard Substrata
- Intake of large volumes of seawater from the port
- Introduction and spread of non-native species
- Discharge of high volumes of water with depressed or elevated temperatures
- Discharge of co-pollutants (biocide, metals and salinity)
- Increase in ambient lighting
- Waste Discharges to Sea
- Accidental Spills if LNG
- Accidental Spills if Hypochlorite
- Faunal strikes with LNGCs and Dredgers

- Release of diesel to sea during bunkering or due to vessel accident

7.6.3 MITIGATION MEASURES

Construction phase mitigation includes the following:

- All dredging activities and associated environmental monitoring must be conducted in accordance with the conditions stipulated under the port expansion authorisation
- All contractors must have an approved Environmental Management Plan in place that ensures that environmental impacts are minimised as far as practicable possible
- Manage suspended sediment plumes generated during dredging and construction of the LNG Terminal by the installation of silt curtains
- Restrict construction noise and vibration-generating activities to the absolute minimum required

Operational

- Fit deflector plates to discharges directed vertically downwards to modify the discharge to 45°
- Design intakes to minimise entrainment or impingement by reducing the average intake velocity to about 0.1 to 0.15 m/s. This is comparable to background currents in the oceans, and will allow mobile organisms to swim away from the intake under these flow conditions (UNEP 2008)
- Optimise operating modes in the open-loop system as far as possible to reduce impacts, or use closed-loop systems in recruitment areas or during periods when abundances of eggs and larvae are seasonally high
- The developer must undertake an entrainment study prior to commencement of construction to more accurately determine the potential impacts of impingement and entrainment on communities within the Port of Ngqura
- Consider water conservation opportunities for LNG facility cooling systems (e.g. air cooled heat exchangers in place of water cooled heat exchangers and opportunities for the integration of cold water discharges with other proximate industrial or power plant facilities). The selection of the preferred system should balance environmental benefits and safety implications of the proposed choice
- Discharge cooling or cold water to surface waters in a location that will allow maximum mixing and dilution of the thermal plume to ensure that the temperature is within 3 °C of ambient temperature at the edge of the mixing zone or within 100 meters of the discharge point
- The LNGCs must have a Ballast Water Management Plan in place
- Ballast water exchange must be done at least 200 nautical miles from the nearest land in waters of at least 200 m deep; the absolute minimum being 50 nautical miles from the nearest land
- Ensure that routine cleaning of ballast tanks to remove sediments is carried out, where practicable, in mid-ocean or under controlled arrangements in port or dry dock, in accordance with the provisions of the ship's Ballast Water Management Plan
- Use filtration procedures during loading of ballast in order to avoid the uptake of potentially harmful aquatic organisms, pathogens and sediment that may contain such organisms
- Optimise operating modes in the open-loop system as far as possible to reduce impacts, or use closed-loop systems whenever practicable.
- Use multi-port discharges and adjust discharge rate to facilitate enhanced mixing with the receiving water body
- Ports should discharge horizontally or within -45° of horizontal to maximise dilution and avoid erosion of the sediments where the jet hits the seabed
- Neutralise NaOCl with SMBS prior to discharge to ensure that the most conservative international guideline value (<2 µg/ℓ) for residual chlorine at the point of discharge is met
- Blend the brine with the cooling/heating water prior to release
- Implement closed-loop systems whenever practicable
- Implement the principle of mechanical cleaning of the entire system as part of regular annual maintenance of the FSRU in preference to the use of a biocide.
- Reduce lighting in non-essential areas.

- Use of guards to direct lights to areas requiring lighting
- Avoid direct light in water, except during safety inspections
- Low light mounting where possible
- Use of long wavelength lights that are less intense for nocturnal animals
- Compile a lighting plan that identifies specific measures that could be implemented to minimize or avoid impacts associated with operational night-time lighting on avian species, fish species, and marine mammals
- Implement a waste management system that addresses all wastes generated at the various sites, shore based and marine. This should include:
    - Separation of wastes at source;
    - Recycling and re-use of wastes where possible;
    - Treatment of wastes at source (maceration of food wastes, compaction, incineration, treatment of sewage and oily water separation).
- Implement leak detection and repair programmes for valves, flanges, fittings, seals, etc.
- Use a low-toxicity biodegradable detergent for the cleaning of all deck spillages
- All construction activities in the coastal zone must be managed according to a strictly enforced Environmental Management Plan
- Prepare an emergency response plan covering recommended measures to prevent and respond to LNG spills
- The hypochlorite generation unit must be suitably bunded to prevent and spills from the plant entering the marine environment
- Ensure that vessel speed is kept below 10 knots when underway in Algoa Bay.
- The vessel operators should keep a constant watch for slow-swimming large pelagic fish, marine mammals and turtles in the path of the vessel
- Ensure that all project-associated vessels have an oil spill contingency plan in place.
- As far as possible, and whenever the sea state permits, attempt to control and contain the spill at sea with suitable recovery techniques to reduce the spatial and temporal impact of the spill.
- Ensure adequate resources are provided to collect and transport oiled birds to a cleaning station.
- Refuelling is to take place only under controlled conditions within the port.

7.7 Ecological Impact Assessment

STUDY	**Ecological Impact Assessment**
SPECIALIST	**Dr Ted Avis**
COMPANY	**CES Environmental and Social Advisory**
QUALIFICATIONS	**Specialist Declaration and CV, Appendix E**

7.7.1 Conclusion & Specialist Statement

According to the results of the DFFE Screening Report, the Terrestrial Biodiversity theme for the project area is classified as VERY HIGH.

The ecological features likely contributing to the very high sensitivity rating include the location of the proposed project within a Marine Protected Area, namely the Addo Elephant National Park Marine Protected Area. On land, however, the project area falls within the Coega EZ and therefore does not constitute a nationally protected or conservation area. However, the project area does fall within the Coastal Protection Zone vegetated by Cape Seashore Vegetation along the foredune areas and St Francis Dune Thicket in areas protected from direct sea spray. St Francis Dune Thicket in the project area has been invaded by relatively thick pockets of *Acacia cyclops* but still supports several indigenous plant species, including SCC's, and has a well-developed canopy in some dune slacks.

Another factor is the likely occurrence of highly sensitive and/or threatened plant and animal species within the project area.

Out of the thirty-four (34) plant SCC identified as potentially occurring within the project area, the presence of eight (8) species were confirmed on site, while the probability of occurrence for five (5) species is considered very high, eighteen (18) considered medium likelihood, and three (3) low. In terms of fauna, no SCC were confirmed present on site, however two (2) SCC are highly likely to occur, particularly within the thicket and bontveld vegetation types.

Based on the findings of the site investigation and the high likelihood of occurrence for some plant and faunal SCC, as well as the low rehabilitation potential of affected ecosystems once disturbed, it was established that Grassridge Bontveld is highly sensitive while St Francis Dune Thicket and Sundays Valley Thicket are medium sensitivity. St Francis Dune Thicket was considered to have a very low sensitivity. This sensitivity rating is valid despite all ecosystems being classified as Least Concern on the SANBI Red List of Ecosystems (2021). As such, it can be expected that the proposed project will negatively affect key biodiversity features.

However, considering the nature of the proposed development, which is mostly linear, and the size, which is relatively small, the expected loss of biodiversity can be considered minimal. However small this still most likely will contribute to the cumulative loss of key biodiversity features within the wider project area, such as the Coega IDZ. For example, the continuous development within the IDZ and expansion is predicted to have a significant negative impact on, for example, Grassridge Bontveld vegetation in the future and the long-term impact could be significant (Mucina & Rutheford, 2006-2018).

No development on the other hand could negatively influence future investment within the Coega SEZ, an area specifically zoned for industry and development.

Overall, the ecological impacts of the proposed development were assessed and considered to be acceptable provided the mitigation measures outlined in this report are implemented. To reiterate, the implementation of the recommended mitigation measures is critical to ensure this development is ecologically sound. In addition, it is important that the Alien Vegetation Management Plan developed for the Coega SEZ is implemented and adhered to during the construction and operational phase of the proposed development to prevent the further spread of alien invasive species within Zone 10 of the Coega SEZ. Further mitigation could involve eradicating alien invasive species from the surrounding areas to minimise the cumulative ecological impacts associated with the proposed development.

7.7.2 IMPACTS

- Loss of Indigenous Vegetation
- Loss of OSMP (2014) Sensitive Species and Habitat
- Loss of Plant SCC
- Loss of herpetofauna SCC and/or loss of faunal habitat
- Loss of mammal SCC and/or loss of faunal habitat
- Loss of CBA (Coega OSMP)
- Loss of Aquatic ESA (ECBCP)
- Disruption of Ecosystem Function and Process
- Habitat fragmentation and/or degradation
- Establishment and/or Spread of Alien Plant Species
- Disturbance and/or death of faunal SCC

7.7.3 MITIGATION MEASURES

- All necessary permitting and authorisations pertaining to indigenous terrestrial biodiversity (i.e., plants and animals) must be obtained prior to the commencement of any construction activities
- A suitably qualified ECO must be appointed prior to the commencement of the construction phase. If this appointment is to be done in-house by the CDC, then it is important to ensure that the ECO has sufficient knowledge of the local fauna and flora. If not, an external specialist might need to be appointed
- Except to the extent necessary for the carrying out of construction works, plants shall not be removed, damaged, or disturbed. The clearance of vegetation at any given time should be kept to a minimum and vegetation clearance must be strictly limited to the development footprint(s)
- Ground truthing of the development footprint(s) must be conducted by an experienced botanist prior to vegetation clearance to ensure that no populations of rare and/or threatened plant species will be lost. The development footprint (i.e., pipeline and hub site) must be micro-sited prior to construction. During micro siting attempts must be made to avoid as many SCC's as possible, and if this not possible, geophytes and succulent species need to be translocated and the seeds of other species collected for propagation in a nursery for use in rehabilitation activities. Only plant SCC which are known to survive translocation should be relocated to the nearest appropriate habitat
- A thorough Search and Rescue (S&R) for plant SCC should be conducted prior to vegetation clearance. This must be carried out in accordance with the Project Vegetation Specification (PVS) by a competent and qualified service provided
- In areas where vegetation density restricts access and the ability of S&R teams to conduct thorough searches, strip clearing of the thicket vegetation using a tractor loaded backhoe (TLB) is permitted to allow access into the dense vegetation for the S&R efforts
- Except to the extent necessary for the carrying out of the Works, fauna shall not be removed, injured, disturbed, or killed. Trapping, poisoning, poaching and/or shooting of fauna is strictly forbidden. No domestic pets or livestock are permitted on site
- A thorough Search and Rescue (S&R) for herpetofauna SCC should be conducted prior to vegetation clearance by a qualified herpetologist. If found, herpetofauna SCC's should be placed in similar habitat directly adjacent to the affected area
- The priority biodiversity areas delineated by the Coega OSMP, including the Ecological Support Area and the Secondary Dune have been classified as HIGH sensitivity and the strict management/mitigation measures as specified in the approved OSMP (2014) and Section 8.1 of this report must be applied to development in or near these areas
- The Alien Vegetation Management Plan developed for the Coega SEZ must be implemented and managed to prevent the further spread of alien invasive species within Zone 10 of the Coega SEZ. This requires active management and maintenance
- A comprehensive Rehabilitation Plan must be compiled and implemented. Only indigenous plant species typical of the local vegetation should be used for rehabilitation purposes. This requires active management and maintenance
- An Erosion Management Plan must be developed prior to the commencement of construction activities to mitigate the unnecessary loss of topsoil and runoff. This requires active management and maintenance
- Activities within 500 m upstream of a wetland must obtain the necessary Water Use License prior to the commencement of such activities
- Lay down areas must not be located within any watercourses or drainage lines

7.8 DAMARA TERN IMPACT ASSESSMENT

STUDY	Damara Tern Impact Assessment
SPECIALIST	Dr Paul Martin & Mr Oliver Knopperson
COMPANY	Acoustech Consulting Engineers
QUALIFICATIONS	Specialist Declaration and CV, Appendix E

7.8.1 CONCLUSION & SPECIALIST STATEMENT

The Damara Tern is Critically Endangered in South Africa with an estimated 52 breeding pairs of which 43 pairs (83%) breed in Algoa Bay in four colonies, two of which are in the Coega SEZ. At the Abalone Farm colony on the dunefield in Zone 10 adjacent to the proposed Gas Hub 9-11 pairs (17% of the South African population) have bred during the past two seasons but with a median of 3 pairs (7% of the South African population) since 2007. South Africa has only 6.7% of the estimated global population of 773 breeding pairs with nearly all the others breeding in Namibia. Damara Terns nest where there are large coastal dunefields and are sensitive to disturbance at their breeding sites.

The Gas Infrastructure is assessed according to two distinct phases of the proposed gas infrastructure. Phase 1 when LNG and Natural Gas is supplied by the FSRUs moored in the Port. Phase 2 when the FSRUs are replaced by the LNG Storage and regasification units at the Gas Hub and LNG is supplied direct to the Gas Hub by the LNG Carrier. At the Gas Hub, Phase 1 will comprise the Road Loading Facility and Weighbridge in the north-western portion of the site. Phase 2 will comprise the balance of the infrastructure, in the south-eastern portion of the site, closest to the mobile dunefield.

The proposed site for the Gas Hub in Zone 10 is 200m from the delineated Damara Tern colony and the proposed sites for the Zone 10S and Zone 10N 1000 MW Power Plants are 300m from the colony.

Phase 1 of the Gas Infrastructure project comprises Port of Ngqura infrastructure, gas pipelines and road loading facility in the north-west portion of the Gas Hub furthest from the Damara Tern colony. The overall impact, based on disturbance due to visible physical structures, airborne noise, lights and general disturbance caused by human activities, vehicle and equipment movements during both the construction and operations of Phase 1 of the Gas Infrastructure is assessed to be Moderate Negative reducing to Low Negative after mitigation.

Phase 2 of the Gas Infrastructure comprises the LNG storage tanks and regasification unit at the Gas Hub, close to the Damara Tern colony. The overall impact, based on disturbance due to visible physical structures, airborne noise, lights and general disturbance caused by human activities, vehicle and equipment movements during both the construction and operations of Phase 2 of the Gas Infrastructure is assessed to be High Negative and remains High Negative after mitigation. Cumulative Impacts are also High Negative after mitigation.

The likely mechanism of the impact is that fewer breeding pairs will establish territories, they may more readily abandon the breeding area mid-season and breeding success is likely to decrease, ultimately resulting in the extinction of the colony. It is probable that breeding pairs will eventually move to one of the other Algoa Bay colonies.

Sand mining has impacted 50% of the dunefield to date and the impact of past and future sand mining was assessed to be of Moderate Negative significance for the No-Go Alternative reducing to Low negative in the very unlikely scenario of no further sand mining taking place.

Following the Species Environmental Assessment Guidelines (SANBI 2020), the Site Ecological Importance of the Damara Tern colony was determined to be High. The SANBI Guidelines indicate that limited activities of low impact are acceptable. Consequently development of Phase 1 of the Gas Infrastructure Project is acceptable with respect to the sustainability of the Damara Tern colony if mitigation recommendations are implemented.

For high Site Ecological Importance the most appropriate mitigation for developments with high residual impacts (i.e. Phase 2 of the Gas Infrastructure) is avoidance (selecting an alternative site with lower impacts), failing which offset mitigation may be required. A minimum buffer for high impact developments of approximately 1km from the Damara Tern colony is required (this also conforms to general guidelines for bird Species of Conservation Concern) and this is the preferred option. There is the possibility of an offset opportunity to provide the important Damara Tern colony at Schelm Hoek with formal protection, ideally by including it in the adjacent Addo Elephant National Park, but the feasibility of this would need to be investigated.

7.8.2 IMPACTS

- Phase 1: Impact due to construction phase disturbance
- Phase 1: Impact due to operational phase disturbance
- Phase 2: Impact due to construction phase disturbance
- Phase 2: Impact due to operational phase disturbance

7.8.3 MITIGATION MEASURES

Mitigation Applicable to Construction and Operations:

- A No-Go buffer of 200m around the Damara Tern colony must be permanently demarcated and no activities or human movement are permitted within this buffer. Exceptions would be management activities (such as litter picking) outside the breeding season only and specialist monitoring of the breeding colony.
- All lighting must be down / shielded lighting, not directed towards the Damara Tern colony and should be kept within the site boundaries and at the minimum required for security and health and safety.
- A light audit on a moonless night must be undertaken on the boundaries of the 200m No-Go buffer around the Damara Tern colony before construction and operations start, to establish a baseline and in September of each year (prior to the Damara Tern breeding season). The target should be to ensure a light level of <1 lux on the ground (Jagerbrand & Bouroussis 2021).
- No domestic animals (e.g. feral cats and dogs) are to be tolerated. If present they need to be removed to a suitable facility.
- CDC must establish a Damara Tern Management Programme that includes specialist monitoring of the Damara Tern colonies in Algoa Bay by a suitably qualified and experienced professional. An annual report on the status of the Damara Tern population in the Coega SEZ and Algoa Bay, providing management recommendations where appropriate, including the position of the 200m No-Go buffer should the colony move, must be submitted for approval to CDC and the Coega Environmental Monitoring Committee.
- The key performance indicators for the sustainability of the Damara Tern colony are at least three pairs of Damara Terns nesting per year and at least a 33% fledging rate (i.e. at least one chick being successfully reared per year).

Mitigation Applicable to Construction of Phase 1:

- The Phase 1 development within the Gas Hub (road loading facility, weighbridge, entrance gate, administrative offices, construction site offices and facilities) must be located in the north-west portion of the Gas Hub, as far from the Damara Tern colony as possible.
- Ideally, to avoid some of the mitigation measures below, all Phase 1 construction activities east of the south-north pipeline corridor, located approximately 500m west of the Damara Tern colony, should take place outside of the Damara Tern breeding season, 1 October to end February.
- During the Damara Tern breeding season, 1 October to end February, construction must take place only during daylight hours to take advantage of the unstable atmospheric conditions during the day to ameliorate noise and to prevent lights from vehicles, machinery and the construction site from disturbing the colony.
- A noise reduction plan, approved by a Professional Engineer and a practitioner qualified in acoustics must be developed with the objective of ensuring that daytime noise levels attributable to construction activities do not exceed 50 dBA at the western boundary of the Damara Tern colony during the Damara Tern breeding season. The plan must detail how this will be measured, monitored and reported on.
- Loud construction activities, especially those causing sudden loud noises (e.g. piling) must be scheduled for periods outside of the Damara Tern breeding season, 1 October to end February.
- All construction vehicles and equipment must be well maintained and in good condition.
- Construction staff should receive "noise sensitivity" training such as switching off vehicles and equipment when not in use.
- During the Damara Tern breeding season 1 October to end February, the boundaries of the construction footprints closest to the Damara Tern colony (generally the southern and south-eastern boundaries) must be fenced off to prevent human access and disturbance and must be screened off to prevent visual disturbance (fence should be a minimum of 2m high with e.g. shade cloth able to withstand the strong winds). There must be no activity between the fence and the Damara Tern colony.
- CDC's Standard Environmental Specifications for Construction must be strictly adhered to. These control most of the negative impacts associated with construction activities (e.g. minimise construction footprint, management of construction material, chemicals and equipment, dust control, waste management, provision and control of ablutions and dining areas, worker induction and toolbox talks).

Mitigation Applicable to Operations of Phase 1:

- Phase 1 of the Gas Hub (the road loading facility) must be fenced off to contain human access and disturbance within the facility. The south east boundary (closest to the Damara Tern colony) must be sufficiently high (e.g. 3m) and screened off (ideally with a wall) to prevent visual disturbance to the colony, especially from vehicle headlights. Ideally the road loading facility should operate during daylight hours only (during the Damara Tern breeding season, 1 October to end February) to minimise disturbance to the colony from vehicle headlights
- Planned maintenance of the gas pipelines east of the south-north corridor must not take place during the Damara Tern breeding season, 1 October to end February. If emergency repairs or inspections are required during the Damara Tern breeding season they should be undertaken during daylight hours and the work site should be screened off (e.g. high fence, shadecloth), in a similar manner to that required by the construction phase mitigation
- CDC's Operational Safety, Health and Environmental Management Plan for the Coega SEZ must be complied with. This management plan is applicable to all tenants and governs the management, monitoring and reporting requirements for most operational activities (e.g. environmental awareness, waste, storm-water, waste- water, air quality management, noise control, pollution control, management of hazardous substances, emergency preparedness, visual impacts, alien vegetation management, species of conservation concern, problem animal control, resource management)

Mitigation Applicable to Construction of Phase 2:

The additional mitigation measures below apply to that portion of the Phase 2 Gas Infrastructure construction east of the south-north pipeline corridor, especially construction within the Gas Hub. Even if the mitigation measures are fully implemented, it is likely that high residual impacts will remain that cannot be mitigated.

- Ideally, to avoid some of the mitigation measures below, all Phase 2 construction activities east of the south-north pipeline corridor, located approximately 500m west of the Damara Tern colony, should take place outside of the Damara Tern breeding season, 1 October to end February. However, it is very unlikely that this will be possible with a project of this magnitude.
- During the Damara Tern breeding season, 1 October to end February, construction must take place only during daylight hours to take advantage of the unstable atmospheric conditions during the day to ameliorate noise and to prevent lights from vehicles, machinery and the construction site from disturbing the colony.
- A noise reduction plan, approved by a Professional Engineer and a practitioner qualified in acoustics must be developed with the objective of ensuring that daytime noise levels attributable to construction activities do not exceed 50 dBA at the boundaries of the Damara Tern colony during the Damara Tern breeding season. The plan must detail how this will be measured, monitored and reported on.
- Loud construction activities, especially those causing sudden loud noises (e.g. piling) must be scheduled for periods outside of the Damara Tern breeding season, 1 October to end February
- All construction vehicles and equipment must be well maintained and in good condition Construction staff should receive “noise sensitivity” training such as switching off vehicles and equipment when not in use.
- Fencing around the Gas Hub will contain human access and disturbance within the Gas Hub precinct. In addition, during the Damara Tern breeding season 1 October to end February, the south-eastern boundary of the Gas Hub and the west and east boundaries for a distance of at least 200m northwest of their junction with the south-eastern boundary, must be screened off to prevent visual disturbance to the Damara Tern colony (e.g. with shade cloth able to withstand the strong winds). Unfortunately, even a 3m high fence will not adequately screen construction of the larger components of the project
- CDC’s Standard Environmental Specifications for Construction must be strictly adhered to. These control most of the negative impacts associated with construction activities (e.g. minimise construction footprint, management of construction material, chemicals and equipment, dust control, waste management, provision and control of ablutions and dining areas, worker induction and toolbox talks).

Mitigation Applicable to the Operation of Phase 2:

The additional mitigation measures below apply primarily to operations within the Gas Hub due to its close proximity to the Damara Tern colony. Even if the mitigation measures are fully implemented, it is likely that high residual impacts will remain that cannot be mitigated.

- The Gas Hub must be fenced off to contain human activities within the Gas Hub precinct. The south east boundary (closest to the Damara Tern colony) and the west and east boundaries for a distance of at least 200m northwest of their junction with the south-eastern boundary, must be screened off to prevent visual disturbance to the Damara Tern colony (ideally with a wall). Unfortunately, even a 5m high wall will not adequately screen the larger components of the project.
- Planned maintenance of the gas pipelines east of the south-north corridor must not take place during the Damara Tern breeding season, 1 October to end February. If emergency repairs or inspections are required during the Damara Tern breeding season they should be undertaken during daylight

hours and the work site should be screened off (e.g. high fence, shadecloth), in a similar manner to that required by the construction phase mitigation.

- CDC's Operational Safety, Health and Environmental Management Plan for the Coega SEZ must be complied with. This management plan is applicable to all tenants and governs the management, monitoring and reporting requirements for most operational activities (e.g. environmental awareness, waste, storm-water, waste-water, air quality management, noise control, pollution control, management of hazardous substances, emergency preparedness, visual impacts, alien vegetation management, species of conservation concern, problem animal control, resource management)

Specialist Opinion

The Authors are of the opinion that development of Phase 1 of the Gas Infrastructure project comprising the gas infrastructure and FSRUs in the Port of Ngqura, gas pipelines and road loading facility in the north-west portion of the Gas Hub can proceed with acceptable impacts on the sustainability of the Abalone Farm Damara Tern colony subject to the implementation of the mitigation measures in 11.1.1, 11.1.2 and 11.1.3.

The Authors are of the opinion that development of Phase 2 of the Gas Infrastructure Project that includes two LNG Storage tanks and a regasification facility at the Gas Hub will result in adverse impacts to the nearby Damara Tern (Critically Endangered) colony that supports 9 pairs (17%) of the South African population. The impacts due to the physical (visual) presence of the infrastructure and the associated anthropogenic disturbance cannot, in the opinion of the Authors, be adequately mitigated and the residual impact is assessed to be of high negative significance. This is likely to result in a decrease in the number of breeding pairs, a decrease in breeding success and ultimately extinction of this Damara Tern colony.

8 IMPACT ASSESSMENT

8.1 IMPACT ASSESSMENT METHODOLOGY

The following standard rating scales have been defined for assessing and quantifying the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. The identified impacts have been assessed against the following criteria:

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 with scores assigned, as presented in Table 1 to determine the overall significance of an activity. The total scores recorded for the effect (which includes scores for duration; extent; consequence and probability) and reversibility / mitigation are then read off the matrix presented in Table 8-1, 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 used are listed and explained in Table 8-1 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.

The relationship of the issue to the temporal scale, spatial scale and the severity are combined to describe the overall importance rating, namely the significance of the assessed impact.

The impact is first classified as a positive (+) or negative (-) impact. The impact then undergoes an evaluation according to a set of criteria.

Table 8-1: Ranking of Evaluation Criteria.

Effect	**Duration**	
	Short term	Less than 5 years
	Medium term	Between 5-20 years
	Long term	More than 20 years
	Permanent	Over 40 years or resulting in a permanent and lasting loss
	Extent	
	Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
	Study area	The proposed site and its immediate surroundings.
	Municipal	Impacts affect the Nelson Mandela Bay Metropolitan Municipality, or any towns within the municipality.
	Regional	Impacts affect the wider area or the Eastern Cape Province as a whole.
	National	Impacts affect the entire country.
	International/Global	Impacts affect other countries or have a global influence.

	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	
	Definite	More than 90% sure of a particular fact. Should have substantial supportive data.
	Probable	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
	Possible	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.
	Unsure/Unlikely	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.
Reversibility/ Mitigation	**Impact Reversibility / Mitigation**	
	Easy	The impact can be easily, effectively and cost effectively mitigated/reversed
	Moderate	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

Table 8-2: Impacts Severity Rating

Impact severity *(The severity of negative impacts, or how beneficial positive impacts would be on a affected system or affected party)*	
Very severe	**Very beneficial**
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.
Severe	**Beneficial**
Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.
Moderately severe	**Moderately beneficial**
Medium to long term impacts on the affected system(s) or party (ies), which could be mitigated. For example constructing a sewage treatment facility where there was vegetation with a low conservation value.	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage effluent quality.
Slight	**Slightly beneficial**
Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
No effect	**Don't know/Can't know**
The system(s) or party(ies) is not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.

Table 8-3: Overall Significance Rating

OVERALL SIGNIFICANCE *(THE COMBINATION OF ALL THE ABOVE CRITERIA AS AN OVERALL SIGNIFICANCE)*	
VERY HIGH NEGATIVE	**VERY BENEFICIAL (VERY HIGH +)**
These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects. Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance. Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.	
HIGH NEGATIVE	**BENEFICIAL (HIGH +)**
These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light. Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated. Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.	
MODERATE NEGATIVE	**SOME BENEFITS (MODERATE +)**
These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial. Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.	
LOW NEGATIVE	**FEW BENEFITS (LOW +)**
These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect. Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels. Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.	
NO SIGNIFICANCE	
There are no primary or secondary effects at all that are important to scientists or the public. Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.	
DON'T KNOW	
In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information. Example: The effect of a development on people's psychological perspective of the environment.	

All feasible alternatives and the "no-go option" will be equally assessed in order to evaluate the significance of the "as predicted" impacts (prior to mitigation) and the "residual" impacts (that remain after mitigation measures are taken into account). The reason(s) for the judgement will be provided when necessary.

All impacts must have a "cause and comment", a significance rating before mitigation, after mitigation and for the no-go option. Impacts should also indicate applicable mitigation measure/ recommendations to reduce the impact significance.

8.1.1 CUMULATIVE IMPACT APPROACH

While individual development activities can have minor impacts, the combined impacts of many developments can have serious local, regional, and even global repercussions. In this regard, Appendix 3 section 3 on the EIA process included in the 2014 EIA Regulations as amended in 2017, indicates that an EIR must contain information that is necessary for the Competent Authority to consider and come to a decision on an application and must include:
(j) An assessment of each identified potentially significant impact and risk, including: (i) cumulative impacts.

The Regulations define cumulative impacts as follows: "cumulative impacts", in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

The International Finance Corporation (IFC) (2013:21) of the World Bank defines a Cumulative Effects Assessment (CEA) as the process of:

- Analysing the potential impacts and risks of proposed developments in the context of the potential effects of other human activities and natural environmental and social external drivers on the chosen [valued component] over time; and
- Proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risks to the extent possible.

Ecological and socio-economic systems can absorb or adapt to change, but not indefinitely. The increased pace and intensity of development activities in many regions of the world, combined with increased concern for environmental protection, has elevated the importance of CEA and management in recent years. Governments, nongovernment organizations, and project proponents are seeking innovative ways to address cumulative effects arising from climate change, worsening air quality, freshwater shortages, deforestation, noise and light pollution, and wildlife habitat fragmentation.

Cumulative effects are typically the result of incremental changes to the environment caused by multiple human activities and natural processes. For example, wildlife habitat fragmentation has many possible causes such as road building, clearing native vegetation for land development, and water diversion projects. However, cumulative effects can also result from repetitive actions such as cyclical or episodic discharges of liquid waste or sewage into a water body or many wells tapping and depleting an aquifer. There are many different types of cumulative effects including additive, interactive, and synergistic, and they manifest in different ways whereby the ability of the environment to absorb or adapt to the effect is ultimately exceeded. Ideally, CEA leads to decisions that maintain environmental resiliency.

The purpose of a CEA process is to identify the relative contribution of a proposed activity to the total stresses on the affected environment and to determine whether that environment will be able to sustain the additional stress. To accomplish this, CEA methodology typically involves scoping, baseline studies and analysis of change trends, mitigation, significance determination and adaptive follow-up including monitoring.

For the purposes of the current CEA, high reliance was placed on the results of the various specialist studies, where a specific requirement for each was to identify and assess the contribution of the proposed Coega Gas Infrastructure to the cumulative impacts on the affected environment.

It is also pertinent to note that the current land use of the proposed site and the land use of the properties directly affected by the proposed Gas Infrastructure are zoned as varying levels of Industry, Mining and/or Open Space (CBA, Secondary Support Network, Services Corridor, etc).

Cumulative impacts identified as relevant are:

- Air Quality
- Climate Change
- Noise
- Traffic
- Safety Risks
- Socio-economic benefits
- Marine ecology
- Terrestrial ecology

Section 5.1.6 provides input into the current land uses and the related impacts of past and present developments through the baseline assessments thereof. Therefore the focus of this assessment is on future planned or foreseen developments within the general surrounding area. Limited detail is available for these future developments and therefore the analysis was of a generic nature and focuses on key issues and sensitivities for the project and how these might be influenced by cumulative impacts with other activities.

In the sections below, the severity and extent of cumulative impacts is qualitatively rated to derive a high, medium or low significance rating.

8.1.2 No-go Alternative Impact Approach

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

The status quo for the proposed Coega Gas Infrastructure site would include the following:

IMMEDIATE AREA OF THE PROPOSED GAS INFRASTRUCTURE:

- Alien vegetation (proposed Gas Infrastructure would have a positive impact)
- Mining (proposed Gas Infrastructure would halt mining operations within Zone 10)
- Ecological processes (proposed Gas Infrastructure would have a negative impact)

ADJACENT AREA OF THE PROPOSED Gas Infrastructure:

- Job creation (proposed Gas Infrastructure would have a positive impact)
- Electricity stabilization (proposed Gas Infrastructure would have a positive impact)
- Disturbance of Damara Tern Colony (proposed Gas Infrastructure) would have a positive and negative impact)

8.2 General Impacts

Table 8-4 contains the general impacts associated with the proposed Coega Gas Infrastructure. This table includes direct/indirect impacts, cumulative impacts and no-go alternatives for each impact identified. It includes the issues, impacts, nature, pre-mitigation significance and post-mitigation significance. The full assessment of each impact can be found in Appendix C of this Report. These tables contain full mitigation measures and include duration, extent, consequence, probability, reversibility of each impact. For the summary related to Specialist Impacts, please see Section 7.

8.2.1 Direct/Indirect General Impacts

Figure 8-1 (pre-mitigation) and Figure 8-2 (post mitigation) summarises the direct/indirect impacts. Of the 17 direct and indirect impacts identified and assessed as general impacts, the impacts are largely MODERATE LOW (68%) negative significance pre-mitigation with some MODERATE (26%) the majority of the impacts are rated as LOW negative post-mitigation (95%). Additionally, the remaining impact is rated as LOW positive (6%). There are no HIGH negative significance impacts pre-mitigation or post-mitigation.

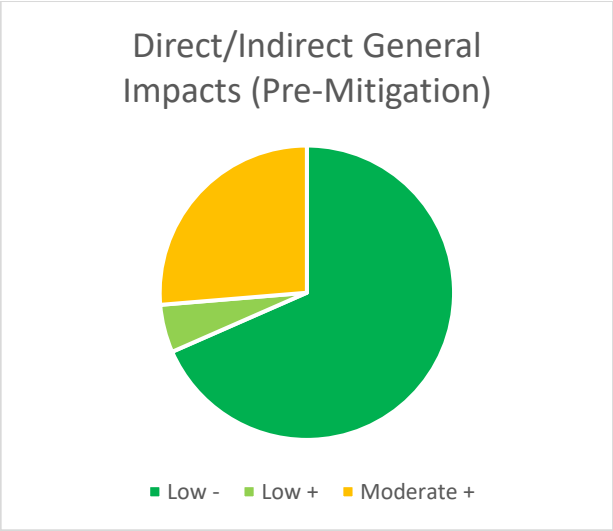


Figure 8-1: Chart Representation of General Direct and Indirect Impacts Significance, Pre-mitigation

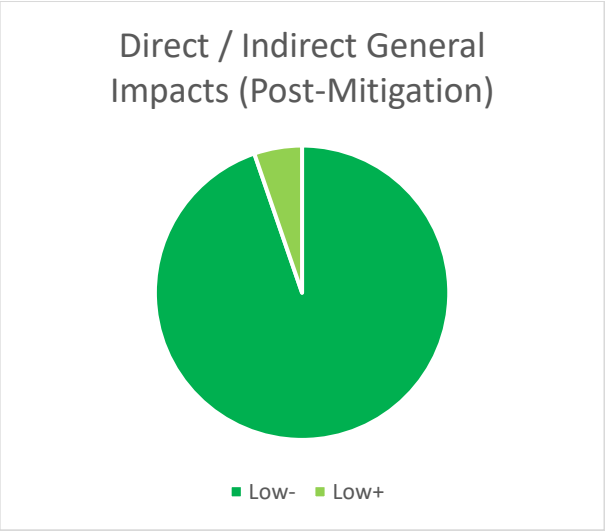


Figure 8-2: Chart Representation of General Direct and Indirect Impacts Significance, Post-mitigation

8.2.2 Cumulative General Impacts

Figure 8-3 (pre-mitigation) and Figure 8-4 (post-mitigation) summarise the cumulative general impacts. Of the 11 cumulative impacts identified and assessed as general impacts, most of the impacts are of a MODERATE negative (73%) and LOW (27%) significance pre-mitigation, with a post-mitigation significance of LOW negative (91%). There are no HIGH negative significance pre-mitigation and no high negative significance post-mitigation.

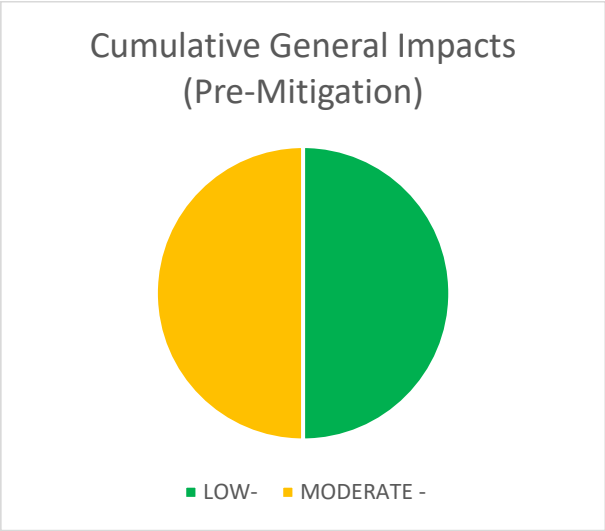


Figure 8-3: Chart Representation of General Cumulative Impacts Significance, Pre-mitigation

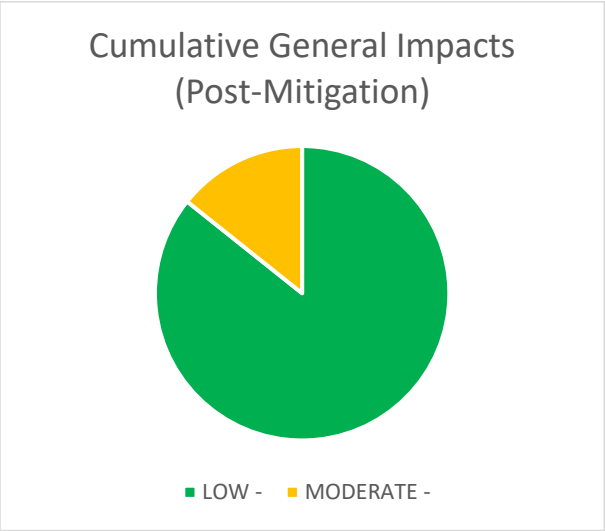


Figure 8-4: Chart Representation of General Cumulative Impacts Significance, Post-mitigation

8.2.3 NO-GO ALTERNATIVES GENERAL IMPACTS

Of the 5 no-go impacts identified and assessed as general impacts, all of the impacts are of a LOW negative significance. No-go impacts relate to impacts already affecting the receiving environment.

Table 8-4: General Impacts Identified and Assessed

ISSUE	DESCRIPTION OF IMPACT		NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION
GENERAL IMPACTS					
VISUAL / SENSE OF PLACE	Altered sense of place and visual intrusion may be caused by earthworks and the operational LNG and Gas Hub. The FSRU(s) and mooring infrastructure is consistent with the existing port infrastructure and the pipeline infrastructure will largely run within existing services corridors. These components are there not expected to result in significant visual impacts. The project is located in an industrial zone (Coega SEZ) in areas allocated to bulk services, energy and aquaculture development. While the LNG and Gas Hub site is sheltered to an extent from sensitive receptors along the N2 and inland, opportunities for visual screening may be limited for receptors along the coast and for offshore viewers (such as visitors to the MPA).				
	CONSTRUCTION	During construction, activities such as increased traffic and dust generation may temporarily negatively impact the visual aesthetics of the area, particularly if viewed from the seaward side of the proposed site.	**DIRECT**	**LOW-**	**LOW -**
	OPERATION	While the LNG and Gas Hub site is sheltered to an extent from sensitive receptors along the N2 and inland, opportunities for visual screening may be limited for receptors along the coast and for offshore viewers (such as visitors to the MPA).	**DIRECT**	**LOW-**	**LOW -**
	Cumulative impact would be MODERATE should the proposed Zone 10 Power Plants be developed.		**CUMULATIVE**	**LOW-**	**LOW -**
	No-go alternative would result however still result in a visual impact related to the current mining operation within the proposed LNG Hub location.		**NO-GO**	**LOW-**	
WASTE MANAGEMENT	With the exception of effluent and air emissions, no large scale systematic waste by-products are expected to be generated as part of the process. Wastes similar to other industrial or manufacturing concerns would naturally be generated, and are expected to be moderate in quantity. No specific waste study has therefore been conducted. Lack of adequate waste management during both construction and operation could result in spread of litter, illegal dumping, contamination soil, water resources and the marine environment, and increased prevalence of scavengers at the site.				
	CONSTRUCTION	During construction, the waste generated will largely be construction waste (rubble, cement waste, packaging, small amounts of hazardous materials), with small amounts of domestic waste from workers on-site. It is anticipated that on-site chemical toilets will be used for sanitation during construction, and it must be ensured that the contents thereof are properly disposed of.	**DIRECT**	**LOW -**	**LOW -**

ISSUE	DESCRIPTION OF IMPACT		NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION
	OPERATIONAL	During operation, waste generated by the LNG and Gas Hub, FSRU and associated facilities could result in the impacts mentioned above if not adequately managed. Waste entering the stormwater system may also result in blockages and downstream contamination	**DIRECT**	**LOW -**	**LOW -**
	Cumulative impact would be LOW as the surrounding environment is largely devoid of pollution, apart from sporadic illegal dumping along undeveloped plots along the R334 towards the N2 intersection.		**CUMULATIVE**	**LOW**	**LOW**
	No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.		**NO-GO**	**NO IMPACT**	
STORMWATER MANAGEMENT AND EROSION	Vegetation clearing and disturbance of soils during construction will leave the ground vulnerable to erosion by water and wind. This could lead to increased sediment load in stormwater runoff, potentially clogging the receiving stormwater infrastructure. Loss of topsoil and erosion will also limit the potential for vegetation growth in these areas, leading to further erosion. There is a risk of downstream erosion and sedimentation if undeveloped cleared areas are not properly rehabilitated during and after the construction phase. An increase in the extent of hardened surfaces from the development will increase the impermeable surface area and lead to reduced ground absorption of stormwater and increased surface water runoff. This will result in an increase in the quantity and velocity of stormwater leaving the site and could result in soil erosion and downstream sedimentation impacts if there is improper storm water management design. Runoff also has the potential to transport potential contaminants (generated from project point sources as well as roads) away from the site into downstream natural environments, including the sea and littoral active zone. Spills or leaks of liquids such as chemicals, hydrocarbons, paints, or water contaminated with paints, solvents, cement of other construction related materials may infiltrate into the soil and thereby enter groundwater resources, by means of ground or surface water runoff. Similarly, during operation, spills or leaks of materials and fuels stored on site may occur during storage or handling, potentially polluting surface and groundwater resources, or the marine environment.				
	CONSTRUCTION	Pollution of Soil and Stormwater, and increase in Erosion.	**DIRECT**	**LOW -**	**LOW -**
	OPERATIONAL	Pollution of Soil and Stormwater, and increase in Erosion.	**DIRECT**	**LOW -**	**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION
	Cumulative impact would be moderate as there are a range of activities, including roads, which contribute to erosion at localised levels. However, these activities are not prevalent in the area.	**CUMULATIVE**	**LOW -**	**LOW -**
	No-go alternative would still present a level of stormwater runoff and erosion due to the current mining activities and existing impermeable surfaces.	**NO-GO**	**LOW -**	
HERITAGE	Damage or destruction to heritage resources on the site may occur due to earthworks and excavations during construction or during maintenance activities, both of marine and onshore infrastructure. As heritage studies have previously been conducted and reports have been compiled by specialists for the Coega SEZ, as well as the port of Ngqura, and no remaining sensitive areas/material was identified within the proposed development area, no additional heritage studies were undertaken. Zone 10, being close to the coast, was however noted as a sensitive area in general from a heritage perspective, and for this reason additional mitigation measures were recommended by the specialist. The mitigation measures listed below are as per the recommendations made by the specialist at the time. In addition, SAHRA mentioned that due to the port having a long history of maritime heritage, while noting that it is unlikely that further new material will be discovered as the area along the breakwater has already been disturbed, any heritage finds during construction in the port must be reported to them for further assessment. No impacts are anticipated during operation			
	Damage or destruction to heritage resources on the site may occur due to earthworks and excavations during construction or during maintenance activities, both of marine and onshore infrastructure.	**DIRECT**	**LOW -**	**LOW -**
	Cumulative impact, on a localised scale, would be high as the area does contain illegal dump sites, at times. These sites are located to the west of the site and not on the site itself.	**CUMULATIVE**	**LOW -**	**LOW -**
	No-go alternative would still present a risk of disturbance or destruction of heritage resources through the current mining operations at the proposed LNG and Gas Hub location.	**NO-GO**	**LOW -**	

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION
GENERAL CONSTRUCTION IMPACTS				
DUST NUISANCE	Dust generated by construction activities has the potential to impact on off-site access roads by creating a dust nuisance to other tenants in the sez and impairing visibility on the roads thereby affecting traffic safety and visual impacts. Excess dust can also draw undue attention to the site by increasing the visibility of construction activities. The impact of dust is more of a nuisance nature and does not typically pose a health risk due to the typically coarse size of the dust particles.			
	Dust is likely to be a potential nuisance due to the construction activities.	**DIRECT**	**LOW -**	**LOW -**
	Cumulative impact would be moderate should the adjacent sites be developed simultaneously. Improper management of a neighbouring sites would exacerbate the impact.	**CUMULATIVE**	**MODERATE -**	**LOW -**
	No-go alternative would still present a risk of dust nuisance through the current mining operations and transportation of material at the proposed LNG and Gas Hub location.	**NO-GO**	**LOW -**	
FIRE	Much of the zone 10 and surrounding vegetation is largely made up of dune thicket invaded by woody aliens, which is susceptible to burning, and therefore the risk of bush fires spreading to the proposed gas infrastructure must be considered. Zone 13 is largely surrounded by other development and indigenous vegetation including thicket, which is generally not susceptible to burning. There is a risk however of fires originating from within the development due to construction activities or general anthropogenic impacts. The potential risks of a fire or explosion occurring during operation of the site are assessed and covered in the quantitative risk assessment,			
	Risk of runaway fires from construction activities related to having people on site, such as cooking, smoking or burning of vegetation might lead to the burning of surrounding vegetation.	**DIRECT**	**MODERATE -**	**LOW -**
	Cumulative impact is LOW due to the temporary nature of the risk during construction and is dependent on the simultaneous construction within the SEZ and the perceived cumulative increase in ignition risks. . .	**CUMULATIVE**	**MODERATE -**	**LOW -**
	No-go alternative would, apart from the existing woody alien fuelwood on site, not increase the risk of ignition and subsequent veld fires, and the no-go impact is therefore considered low. .	**NO-GO**	**LOW -**	
DAMAGE TO OTHER INFRASTRUCTURE	While the project layout is intended to fit into the existing or yet to be developed services infrastructure in the sez, there is a potential remains for damage to existing services infrastructure (both underground and above ground) during excavation and other construction related activities. This may result in temporary disruptions to these services, affecting other tenants in the sez			
	Damage and/or disruption of other CDC (or municipal) infrastructure during construction	**DIRECT**	**LOW -**	**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION
	Cumulative impact would be moderate if the disruption of infrastructure / services results in further cumulative disruptions for surrounding tenants / landowners. .	**CUMULATIVE**	**LOW -**	**LOW -**
	No-go alternative would have no impact	**NO-GO**	**NO IMPACT**	
OPERATIONAL PHASE				
VISUAL	While the LNG and Gas Hub site is sheltered to an extent from sensitive receptors along the N2 and inland, opportunities for visual screening may be limited for receptors along the coast and for offshore viewers (such as visitors to the MPA).	**DIRECT**	**LOW -**	**LOW -**
	Cumulative impact would be MODERATE should the proposed Zone 10 Power Plants be developed.	**CUMULATIVE**	**MODERATE -**	**MODERATE -**
	No-go alternative would result however still result in a visual impact related to the current mining operation within the proposed LNG Hub location.	**NO-GO**	**LOW -**	**LOW -**
WASTE MANAGEMENT	During operation, waste generated by the LNG and Gas Hub, FSRU and associated facilities could result in the impacts mentioned above if not adequately managed. Waste entering the stormwater system may also result in blockages and downstream contamination.	**DIRECT**	**LOW -**	**LOW -**
	Cumulative impact would be LOW as the surrounding environment is largely devoid of pollution, apart from sporadic illegal dumping along undeveloped plots along the R334 towards the N2 intersection.	**CUMULATIVE**	**LOW -**	**LOW -**
	No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.	**NO-GO**	**NO IMPACT**	
STORMWATER MANAGEMENT AND EROSION	An increase in the extent of hardened surfaces from the development will increase the impermeable surface area and lead to reduced ground absorption of stormwater and increased surface water runoff. This will result in an increase in the quantity and velocity of stormwater leaving the site and could result in soil erosion and downstream sedimentation impacts if there is improper storm water management design	**DIRECT**	**LOW -**	**LOW -**
	Cumulative impact would be moderate as there are a range of activities, including roads, which contribute to erosion at localised levels. However, these activities are not prevalent in the area.	**CUMULATIVE**	**MODERATE -**	**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION
	No-go alternative would still present a level of stormwater runoff and erosion due to the current mining activities and existing impermeable surfaces.	NO-GO	LOW -	LOW -
DECOMMISSIONING PHASE				
POLLUTION	Littering by construction workers could cause surface and ground water pollution.	DIRECT	MODERATE -	LOW -
	Cumulative impact, on a localised scale, would be moderate as the area does contain sporadic illegal dump sites, at times. These sites are located to the north-west of the N2 and north-east of the site itself.	CUMULATIVE	MODERATE -	LOW -
	No-go alternative would result in no impact related to general waste as the site does not currently experience issues regarding waste.	NO-GO	NO IMPACT	
	Onsite maintenance of construction vehicles/machinery and equipment could result in oil, diesel and other hazardous chemicals contaminating surface and ground water. Surface and ground water pollution could arise from the spillage or leaking of diesel, lubricants and cement during construction activities.	DIRECT	MODERATE -	LOW -
	Cumulative impact would be null as no other new activities, which include the use of hazardous substances are planned for this site (localised impact).	CUMULATIVE	NO IMPACT	
	No-go alternative would result in no impact related to hazardous waste as the site does not currently experience issues related to hazardous substances.	NO-GO	NO IMPACT	
DUST	Dust is likely to be a potential nuisance due to the decommissioning activities.	DIRECT	LOW -	LOW -
	Cumulative impact would be low if surrounding developments are not decommissioned simultaneously. Improper management of a neighbouring sites could exacerbate the impact.	CUMULATIVE	LOW -	LOW -
	No-go alternative would result in no impact related to construction nuisance dust as no other decommissioning activities should be taking place on the site, that we are aware of.	NO-GO	NO IMPACT	
TRAFFIC & TRANSPORT	A high number of heavy vehicle movements will occur during the decommissioning phase. This may have a detrimental effect on sensitive receptors.	DIRECT	MODERATE -	LOW -
	Cumulative impact would be moderate should any neighbouring developments start decommissioning at the same time as the proposed Gas Infrastructure. Improper management of a neighbouring sites would exacerbate the impact.	CUMULATIVE	MODERATE -	LOW -
	No-go alternative would result in no impact related to traffic and transport as no other decommissioning activities should be taking place on the site, that we are aware of.	NO-GO	NO IMPACT	

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION
SOIL EROSION	After the removal of all gas infrastructure, the disturbed soils may become exposed, unstable and prone to erosion.	**DIRECT**	**MODERATE -**	**LOW -**
	Cumulative impact would be moderate should any directly adjacent developments start decommissioning at the same time. Improper management of any neighbouring sites could exacerbate the impact.	**CUMULATIVE**	**MODERATE -**	**LOW -**
	No-go alternative would result in no impact related to soil erosion	**NO-GO**	**NO IMPACT**	
LAND-USE	Land previously unavailable for certain types of land use will now be available for those uses.	**DIRECT**	**LOW +**	**LOW +**
	Cumulative impacts are not anticipated as the proposed site is located within a designated Strategic Environmental Zone (SEZ), and as such future land uses are expected to be of a similar nature to the proposed infrastructure.	**CUMULATIVE**	**LOW +**	**LOW +**
	No-go alternative would result in no impact as the site will return to what it was used for before, i.e. the current status quo.	**NO-GO**	**NO IMPACT**	

8.3 KEY IMPACTS

The following identified impacts that are considered to be key to the impact assessment, in most cases requiring specialist input:

- **Climate change** – both contribution of the proposed gas infrastructure to climate change due to increased emissions of greenhouse gases, and potential vulnerability of the project to the effects of climate change;
- **Noise** – impacts of noise generated by the gas infrastructure development on surrounding receptors (human and environmental);
- **Air quality** – the impacts of atmospheric emissions resulting from operation of the power plant on ambient air quality in the SEZ and surrounding area of influence;
- **Quantitative Risk Assessment** – potential safety risk to the public and other users resulting from catastrophic events relating to storage and handling of dangerous goods on the site; and
- **Socio-economic** – increased employment and improvement in livelihoods, enhancement of skills and knowledge; improvement of the local economy are some of the socio-economic benefits during construction and operation
- **Ecological** – the habitats within the Coega SEZ and proposed footprint host several, localised endemic SCC and habitats at risks emanating from the clearance of vegetation required for the proposed gas infrastructure
- **Marine** – dredging, construction of underwater structures, spoiling of dredged material and discharge of heating and cooling water during operation put the local marine ecology at risk of impact
- **Damara Tern Colony** – the presence of a population of critically endangered Damara Terns near to the proposed location for the LNG and Gas Hub as well as the distribution pipelines which connect to the proposed Port Infrastructure.

These impacts have been assessed by the various specialists through desktop investigation, supported by ground-truthing and predictive modelling where appropriate, or in-house by CES. Copies of the full specialist reports are provided in Appendix C and the findings and recommendations of the studies are discussed below.

Table 8-6 contains the specialist impacts associated with the proposed Coega Gas Infrastructure. This table includes direct/indirect impacts, cumulative impacts and no-go alternatives for each impact identified. This table includes the issues, impacts, nature, pre-mitigation significance and post-mitigation significance. The full assessment of each impact as per Table 8-4 above can be found in Appendix C of this Report and in each individual Specialist Report, Appendix D. These tables contain full mitigation measures and include duration, extent, consequence, probability, reversibility of each impact. For the summary related to General Impacts, please see Section 8.2.

8.3.1 DIRECT/INDIRECT KEY IMPACTS

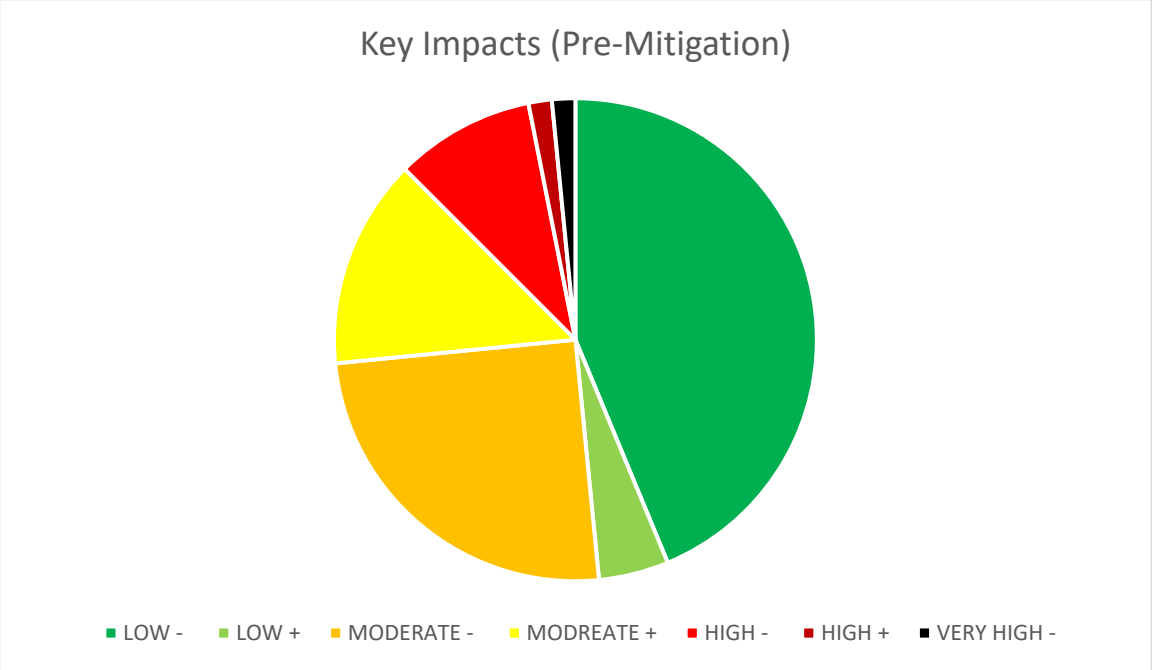


Figure 8-5Figure 8-5 (pre-mitigation) and Figure 8-6 (post mitigation) summarises the direct/indirect specialist impacts. Figure 8-7 (pre-mitigation) and Figure 8-8 (post-mitigation) summarises the cumulative specialist impacts. Of the 65 direct and indirect impacts, the majority are of a LOW (43%) negative impact. The remainder is made up of a split between MODERATE (25%), HIGH (9%) and VERY HIGH (2%) negative impacts, with the remainder made up of LOW (5%), MODERATE (14%) and HIGH (2%) positive impacts. Of the 55 impacts 75% of the impacts are mitigated to LOW negative significance and 3% to MODERATE negative significance. 5% of the HIGH negative impacts and all the VERY HIGH negative impacts cannot be mitigated sufficiently to affect their rating and their ratings remain HIGH (7%) or VERY HIGH (2%) respectively. The negative impacts relate mainly to negative climate change impacts and disturbance to sensitive receptors (Damara Tern Colony). Approximately 2% of the impacts can be enhanced to HIGH positive significance, with the remaining positive impacts being made of MODERATE (8%) and LOW (5%) positive significance. The positive impacts relate largely to anticipated increases in energy security, economic growth and job creation resulting from the proposed development.

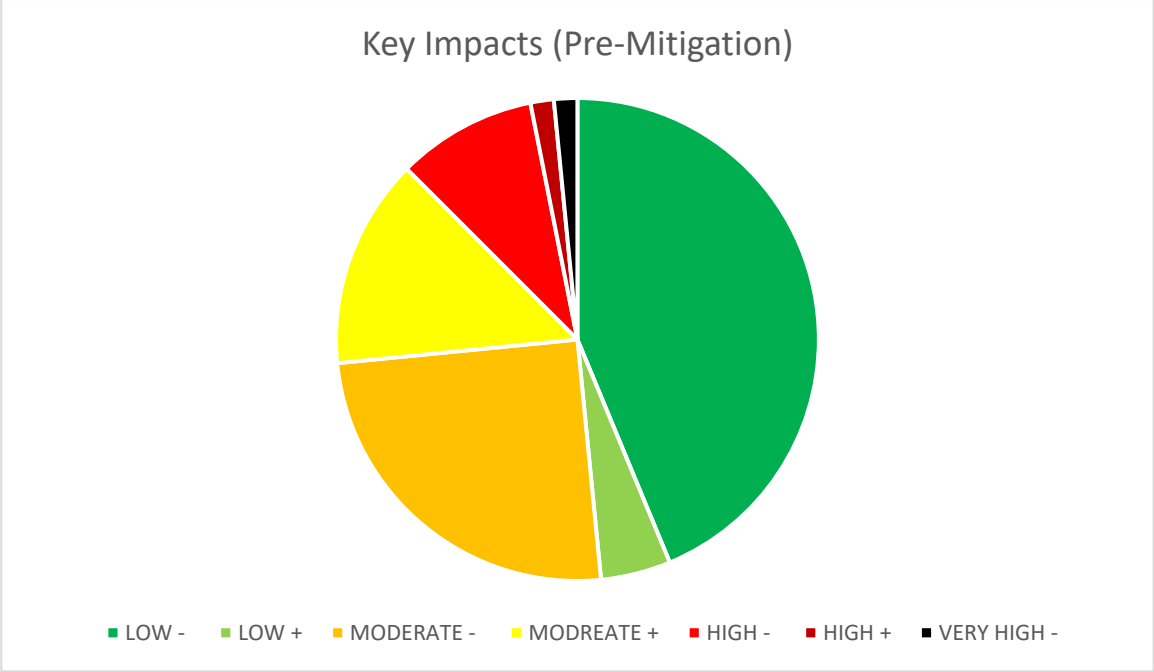


Figure 8-5: Chart Representation of the Key Impacts, Pre-mitigation

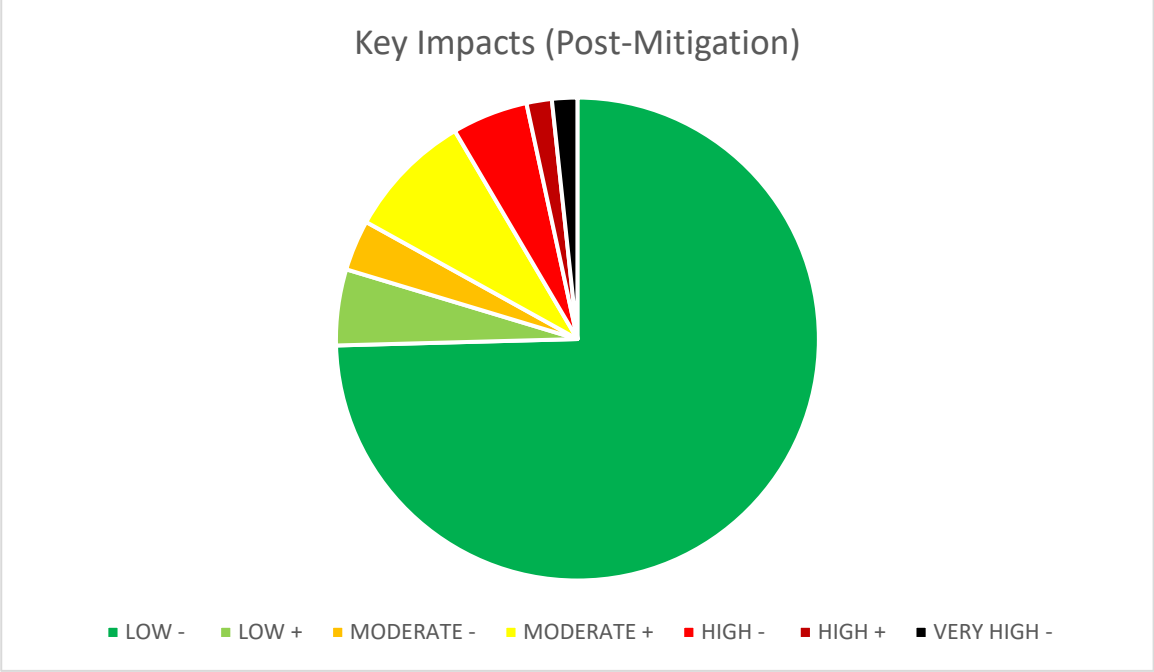


Figure 8-6: Chart Representation of the Key Impacts, Post-mitigation

8.3.2 CUMULATIVE IMPACTS

A total of 64 specialist cumulative impacts were identified. Of the 50 negative cumulative impacts, the majority are of a MODERATE negative (42%) and HIGH negative (18%) pre-mitigation significance within the significance of 24 % of the negative impacts being rated as DON'T KNOW. Cumulative impacts are particularly difficult to mitigate owing to the reliance on numerous developers having the same standard of environmental due diligence, such as monitoring standards, rehabilitation processes, social outreach,

amongst others. Post-mitigation the majority of the negative impacts are MODERATE negative (40%) and LOW negative (28%). 14 positive cumulative impacts were identified, most of which are of LOW positive (93%) pre- and post-mitigation.

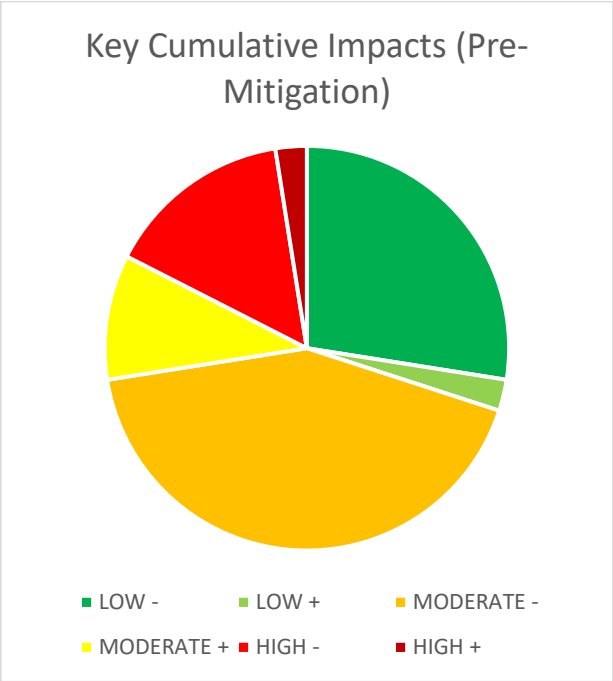


Figure 8-7: Chart Representation of Key Cumulative Impacts, Pre-mitigation

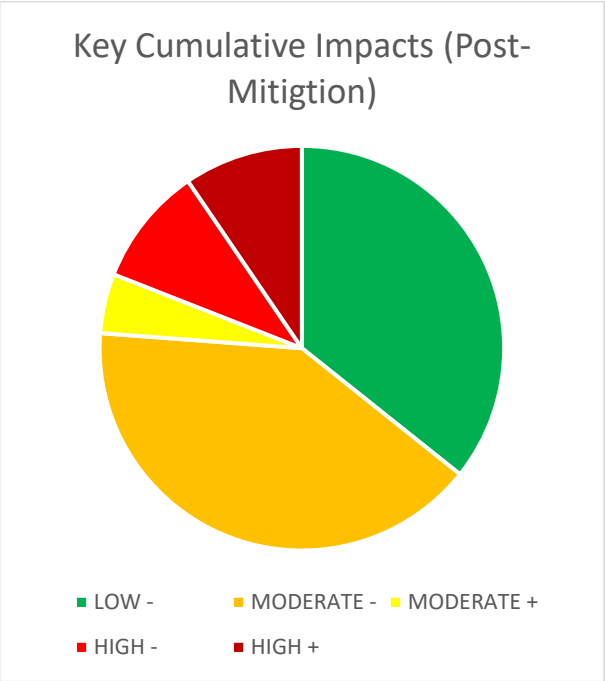


Figure 8-8: Chart Representation of Key Cumulative Impacts Significance, Post-mitigation

8.3.3 No-go Alternatives Key Impacts

Figure 8-9 summarises the no-go specialist impacts, which are the same both pre and post-mitigation. Of the 22 no-go impacts identified and assessed as specialist impacts, most of the impacts are of a MODERATE negative significance. No-go impacts relate to impacts already affecting the receiving environment. The No-Go impacts include impacts related to the continuation of mining activities within the Coega Zone 10 Mining Right Area, the existing invasion of invasive alien species *Acacia cyclops* and the existing infrastructure, marine-traffic and port activity within the Port of Ngqura.

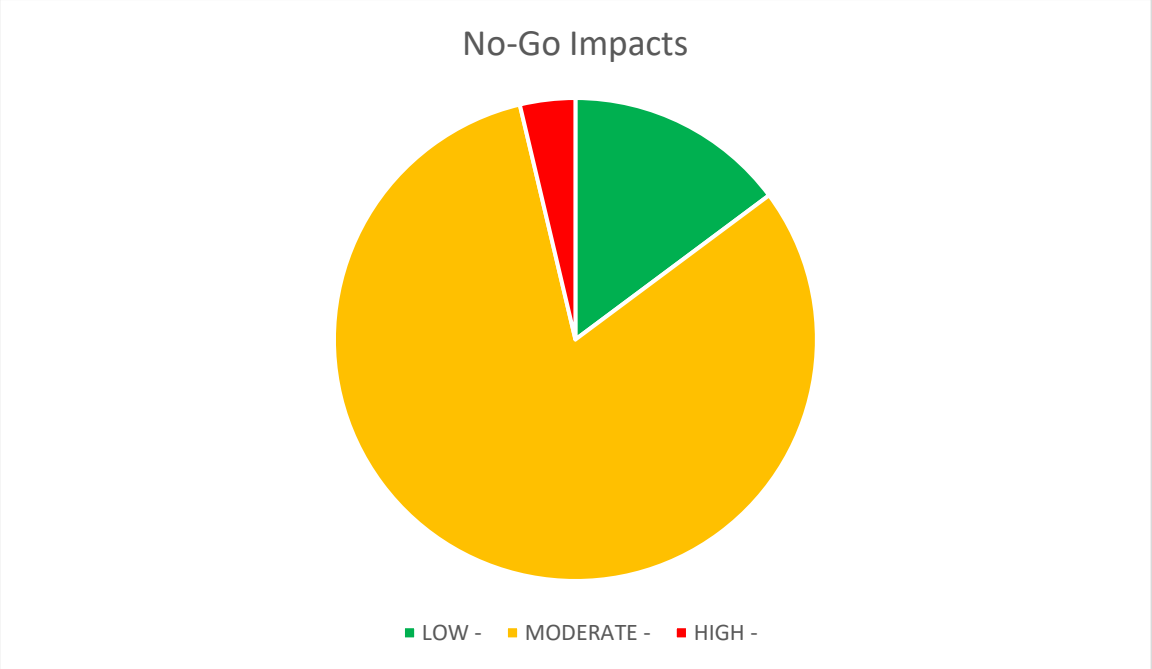


Figure 8-9: Chart Representation of Key No-go Impacts Significance, Pre-mitigation

Table 8-5: Summary of anticipated No-Go alternative impacts

NO-GO IMPACT	PRE-MITIGATION
Disturbance To Damara Tern Colony	MODERATE -
Reduced Physiological Functioning Of Marine Organisms (Due To Turbidity	LOW -
Job Creation	MODERATE -
Economic Growth	MODERATE -
Noise Affecting Sensitive Receptors	MODERATE -
Loss Of Indigenous Vegetation	MODERATE -
Loss Of Sensitive Species Habitat	MODERATE -
Loss Of Plant Scc	MODERATE -
Loss Of Herpetoafauna and Habitat	MODERATE -
Loss Of Mammals and Habitat	LOW -
Loss Of Cba	LOW -
Loss Of Aquatic Esa	LOW -
Disruption Of Ecosystem Function And Process	MODERATE -
Habitat Fragmentation And/Or Degradation	MODERATE -
Establishment And/Or Spread Of Alien Plant Species	MODERATE -
Loss Of Benthic Communities	MODERATE -
Disturbance To Marine Fauna	MODERATE -
Energy Security	HIGH -

Table 8-6: Impact Assessment for Key Impacts Identified

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
CONSTRUCTION PHASE				
DAMARA TERN IMPACT ASSESSMENT				
The Damara Tern is Critically Endangered in South Africa with an estimated 52 breeding pairs of which 43 pairs (83%) breed in Algoa Bay in four colonies, two of which are in the Coega SEZ. At the Abalone Farm colony on the dunefield in Zone 10 adjacent to the proposed Gas Hub 9-11 pairs (17% of the South African population) have bred during the past two seasons but with a median of 3 pairs (7% of the South African population) since 2007. South Africa has only 6.7% of the estimated global population of 773 breeding pairs with nearly all the others breeding in Namibia. Damara Terns nest where there are large coastal dunefields and are sensitive to disturbance at their breeding sites. The proposed site for the Gas Hub in Zone 10 is 200m from the Damara Tern colony and the proposed sites for the Zone 10S and Zone 10N 1000 MW Power Plants are 300m from the colony. Phase 1 of the Gas Infrastructure project comprises Port of Ngqura infrastructure, gas pipelines and road loading facility in the north-west portion of the Gas Hub furthest from the Damara Tern colony. Phase 2 of the Gas Infrastructure comprises the LNG storage tanks and regasification unit at the Gas Hub, close to the Damara Tern colony. The likely mechanism of the impact is that fewer breeding pairs will establish territories, they may more readily abandon the breeding area mid-season and breeding success is likely to decrease, ultimately resulting in the extinction of the colony. It is probable that breeding pairs will eventually move to one of the other Algoa Bay colonies. Sand mining has impacted 50% of the dunefield to date and the impact of past and future sand mining was assessed to be of Moderate Negative significance for the No-Go Alternative reducing to Low negative in the very unlikely scenario of no further sand mining taking place. Following the Species Environmental Assessment Guidelines (SANBI 2020), the Site Ecological Importance of the Damara Tern colony was determined to be High. The SANBI Guidelines indicate that limited activities of low impact are acceptable. Consequently development of Phase 1 of the Gas Infrastructure Project is acceptable with respect to the sustainability of the Damara Tern colony if mitigation recommendations are implemented. For high Site Ecological Importance the most appropriate mitigation for developments with high residual impacts (i.e. Phase 2 of the Gas Infrastructure) is avoidance (selecting an alternative site with lower impacts), failing which offset mitigation may be required. A minimum buffer for high impact developments of approximately 1km from the Damara Tern colony is required (this also conforms to general guidelines for bird Species of Conservation Concern) and this is the preferred option. There is the possibility of an offset opportunity to provide the important Damara Tern colony at Schelm Hoek with formal protection, ideally by including it in the adjacent Addo Elephant National Park, but the feasibility of this would need to be investigated.				

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
CONSTRUCTION DISTURBANCE TO DAMARA TERN COLONY (PHASE 1)	The negative impact of disturbance during construction of Phase 1 of the Gas Infrastructure on the Damara Tern colony is assessed to be Moderate, reducing to Low following successful implementation of mitigation measures. No cumulative impacts are rated for the Construction Phase. The No-Go Alternative prior to mitigation assessed the impact of past and future sand mining (assuming that the 35ha Coega Mining Right will be fully mined) as Moderate Negative. The impact is fully reversible by ceasing sand mining once the current 5ha Ngqura Sand Mine is exhausted (probably within the next 2 years) and not commencing with mining of the Coega Mining Right, resulting in a Low Negative impact after mitigation. However, this mitigation is very unlikely to be implemented and consequently the impact of the No-Go Alternative is considered to be Moderate Negative	**DIRECT**	**MODERATE -**	**LOW -**
		CUMULATIVE	**NO IMPACT**	
		NO-GO	**MODERATE -**	**LOW -**
CONSTRUCTION DISTURBANCE TO DAMARA TERN COLONY (PHASE 2)	The impact rating due to disturbance during construction of Phase 2 infrastructure is consequently based on the Phase 2 construction activities planned within the Gas Hub as these impacts will outweigh other developments further from the colony. Likely disturbance impacts include visual impacts, noise, lighting and movement of personnel and construction machinery. No cumulative impacts are rated for the Construction Phase. The No-Go Alternative prior to mitigation assessed the impact of past and future sand mining (assuming that the 35ha Coega Mining Right will be fully mined) as Moderate Negative. The impact is fully reversible by ceasing sand mining once the current 5ha Ngqura Sand Mine is exhausted (probably within the next 2 years) and not commencing with mining of the Coega Mining Right, resulting in a Low Negative impact after mitigation. However, this mitigation is very unlikely to be implemented and consequently the impact of the No-Go Alternative is considered to be Moderate Negative	**DIRECT**	**HIGH-**	**HIGH-**
		CUMULATIV	**NO IMPACT**	
		NO-GO	**MODERATE -**	**LOW -**
MARINE IMPACT ASSESSMENT				

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
LOSS OF BENTHIC COMMUNITIES	Removal and disturbance of seabed sediments may occur due to the following project-related activities during construction and operation: ❖ dredging within the port for the new LNG berth and release of dredge spoil; ❖ construction of underwater revetments and rock armour, ❖ construction of piles into the seabed for the LNG terminal, and ❖ • discharge of heating and cooling water from the LNGC and FSRU (depending on discharge depth and velocity) during operation. The elimination of marine benthic communities in the dredging area and structural footprint of the LNG Terminal is an unavoidable consequence of the proposed development, and no direct mitigation measures, other than the no-project alternative, are possible. In the case of the heating and cooling water discharges from the LNGC and FSRU, structural adaptations can be implemented to the vessels outlets thereby avoiding impacts to the sediments below the vessels			
	The initial negative impacts are deemed of low intensity within the immediate vicinity of the LNG terminal and dredge disposal site. Furthermore, the negative impacts persist over the short-term only recolonization of unconsolidated sediments will be rapid and as the new structures and rock armouring will offer a new settling ground for hard bottom species and will be rapidly colonised.	**DIRECT**	**LOW -**	**LOW -**
	Cumulative impacts on the marine communities associated with the disturbed sediments are expected. Over the lifetime of the port, these impacts are likely to be of medium significance	**CUMULATIVE**	**MODERATE -**	**MODERATE -**
	No undue impacts are anticipated for the No-Go scenario	**NO-GO**	**NO IMPACT**	
REDUCED PHYSIOLOGICAL FUNCTIONING OF MARINE ORGANISMS (DUE TO TURBIDITY)	Sediment resuspension and increased turbidity may occur due to the activities listed above for impact ME1, the difference being that turbidity is increased with decreasing particle size. Impacts on marine organisms are related to the concentration of suspended material and duration of exposure to it, and range from reduced visibility for feeding, clogging of gills, diminished light penetration affecting photosynthetic capability of aquatic plants. Elevated suspended sediment concentrations and increased turbidity in the Port due to dredging and construction activities, and in the vicinity of the dredge disposal site during dredge spoil disposal is deemed of low intensity within the immediate vicinity of the dredging and construction sites, with impacts persisting over the short-term only.			
	As dredging and construction activities relating to the offloading facilities will be confined to within the Port area, impacts on the adjacent Addo Elephant MPA and Algoa to Amathole EBSA are unlikely. Suspended sediment plumes generated during dumping of dredge spoil and installation of the gas and cryogenic pipelines would, however, overlap with the MPA and EBSA, but as impacts would be highly localised and ephemeral.	**DIRECT**	**LOW -**	**LOW -**
	Cumulative impacts on water quality of medium significance can be expected over the medium to long term	**CUMULATIVE**	**MODERATE -**	**MODERATE -**

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
	No undue impacts are anticipated for the No-Go scenario	**NO-GO**	**LOW -**	**LOW -**
MARINE CONTAMINATION (REBOLISATION)	Resuspension of sediments during dredging and dumping of dredge spoil, as well as construction of piles for the access trestle along the breakwater, may result in the release of contaminants, increased nutrient concentrations and potential alteration of dissolved oxygen levels in the water column. As contaminant concentrations in the sediments are low, and if resuspended should dilute rapidly to background levels, the remobilisation of contaminants and nutrients in the dredge area and spoils disposal site is deemed of low intensity within the immediate vicinity of the dredging and construction sites, with impacts persisting over the short-term only. As dredging and construction activities relating to the offloading facilities will be confined to within the Port area, impacts on the adjacent Addo Elephant MPA and Algoa to Amathole EBSA are highly unlikely. Suspended sediment plumes generated during dumping of dredge spoil and installation of the gas and cryogenic pipelines east of the breakwater could, however, overlap with the MPA and EBSA, but as impacts would be highly localised and ephemeral			
	Although elevated suspended sediment concentrations are an unavoidable consequence of dredging and construction activities, impacts can be kept to a minimum through responsible dredging and construction practices. *Cumulatively, over the lifetime of the port, these impacts are likely to be of medium to high significance*	**DIRECT**	**LOW -**	**LOW -**
		CUMULATIVE	**MODERATE -**	**MODERATE -**
	No undue impacts are anticipated for the No-Go scenario	**NO-GO**	**NO IMPACT**	
DISTURBANCE OF MARINE FAUNA	Dredging, dumping of dredge spoil, deposition of rocks onto the sea bed and pile driving, drilling, etc. during construction of the port infrastructure, as well as pumping of heating and cooling water by the LNGC and FSRU, and regasification of LNG will generate noise and vibrations that may be transmitted underwater and impact on marine organisms.			
	The underwater noise generated by construction barges, dredgers and general construction noise is deemed to be of medium intensity but would remain localised to the port or just beyond and would persist over the short-term only. The long term cumulative impacts of noise on marine organisms in the port are predicted to be of medium significance.	**DIRECT**	**LOW -**	**LOW -**
		CUMULATIVE	**MODERATE -**	**MODERATE -**

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
	No undue impacts are anticipated for the No-Go scenario	**NO-GO**	**NO IMPACT**	
	In the case of pile driving, the intensity of the impact is considered high, and impacts may extend considerable distances beyond the construction site are therefore of regional extent, but persist over the short-term only.	**DIRECT**	**MODERATE -**	**LOW -**
		CUMULATIVE	**MODERATE -**	**LOW -**
	No undue impacts are anticipated for the No-Go scenario	**NO-GO**	**NO IMPACT**	
WASTE DISCHARGES TO SEA	Dredging and construction activities, as well as operation of the LNGC and FSRU at the LNG terminal will result in a reduction of water quality from routine discharges to the sea from vessels. *Cumulative impacts resulting from port developments, vessel discharges and other anthropogenic sources in the Coega SEZ can be expected. Over the lifetime of the port, these impacts are likely to be of medium significance*	**DIRECT**	**LOW -**	**LOW -**
		CUMULATIVE	**MODERATE**	**LOW -**
		NO-GO	**NO IMPACT**	
SOCIO-ECONOMIC IMPACT ASSESSMENT				
THE SOCIO-ECONOMIC IMPACTS RELATED TO THE PROPOSED GAS INFRASTRUCTURE WERE ASSESSED BY CES (THE EAP) USING INFORMATION FROM CDC, IN-HOUSE EXPERIENCE AND A SPECIALIST SOCIAL IMPACT ASSESSMENT WAS NOT CONDUCTED.				
JOB CREATION	The proposed Gas Infrastructure development may result in the direct creation of approximately 2000 temporary job opportunities (over a construction period of 3 years), of which 30% would be unskilled labour. Indirect job opportunities (industries that provide construction materials and services for the project) may also benefit as a result of the construction of the proposed development.	**DIRECT**	**MODERATE +**	**MODERATE +**
		INDIRECT	**MODERATE +**	**MODERATE +**
	The proposed Gas Infrastructure project will help to secure approximately 2,000 direct employment opportunities in the short term and 200 in the long term, and, cumulatively the overall CDC Gas to Power project could potentially result in a significant number of employment opportunities over the construction and operational phases of the project (assuming similar employment numbers for each power plant). The impact is anticipated to be realised over a number of years, as construction of the various components of the broader project is likely to be phased. As the relative timing of development of the various components of the overall project are not yet known, total employment numbers at any one time may vary widely. Increased economic activity is desirable, or even critical, in the context of high unemployment and low income levels. Together with all other productive economic activities in the region, energy production at	**CUMULATIVE**	**MODERATE +**	**MODERATE +**

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	the CDC Gas to Power project benefits the local and national community cumulatively.			
	The No-Go option will result in the loss of job opportunities that will be generated during the construction period.	**NO-GO**	**LOW -**	**LOW -**
ECONOMIC GROWTH	During construction, income to the government is expected to be marginally increased by taxes (VAT) paid by CDC/ the developer on locally procured goods and services. Investment in locally procured goods and services will also have a very limited indirect and induced effect on economic performance.	**DIRECT**	**LOW +**	**LOW +**
	CDC Estimates the Gas Infrastructure development to have a CapEx of approximately R2 billion, disbursed over a 36 month construction period, representing 0.6% of the GVA of R 111.3 billion for the NMBM in 2018, annually for 3 years – a significant short-term investment for a single project. Furthermore, taxes generated by local procurement will contribute a small but significant portion of national income	**INDIRECT**	**MODERATE +**	**MODERATE +**
	The CDC estimates the total cost of construction (CapEx) to develop the entire Gas to Power projects at R8 billion. While the timing and duration of this disbursement is dependent on securing external investors, this would amount to a significant portion of the GVA, at both a local and national level.	**CUMULATIVE**	**MODERATE +**	**MODERATE +**
	The No-Go option will result in the loss of direct and indirect economic growth opportunities that will be generated during the construction period.	**NO-GO**	**LOW -**	**LOW -**
NOISE IMPACT ASSESSMENT				
NOISE AFFECTING NEARBY RECEPTORS	The field study results showed that the ambient noise levels in the area of the proposed development were 49.2dB(A). The Cerebos Office (NSA 3) is approximately 440m away from the nearest pipeline location. Taking this distance into consideration, it can be inferred that NSA 3 will experience noise levels of 58.3 dB(A). While this is above the ambient noise levels, the receptors are expected to be inside the building and thus experience lower noise levels due to the barrier of the building walls blocking the sound from propagating towards these receptors.			
	Construction noise from vehicles, equipment, machinery	**DIRECT**	**LOW -**	**LOW -**
	Noise impacts from the construction and operation of the proposed Gas Infrastructure will be negligible. However, the cumulative levels show that several NSAs will be impacted by the noise that arises during the operational phase from all components of the project.	**CUMULATIVE**	**NO IMPACT**	
	The no-go option will result in the continuation of mining activities within Zone 10 and the resultant noise	**NO-GO**	**MODERATE -**	**MODERATE -**

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	impacts thereof.			
TRAFFIC IMPACT ASSESSMENT				
The following potential traffic related impacts relating to the proposed Gas Infrastructure have been identified. Note that the impacts will occur both in the short-term (i.e. during the construction phase) and medium to long-term once the plant is completed (operational phase): ❖ Road Capacity - Additional vehicle trips generated by the proposed development (up to 323 and 34 additional trips during the AM and PM peak hours for the construction and operational scenarios respectively) will have minimal impact in terms of road capacity given the current low hourly volumes along the road links and at the affected intersections, and low trips generated by the proposed power plant. ❖ Road Pavement - The Coega IDZ Demand Modelling Report indicates that all Class 2 roads would likely need to accommodate 7.5 million E80s per lane over a 20-year period. Given that the Ring Road is a class 2 road it has likely been designed for these volumes. As such the number of E80s generated by the power plant traffic relative to the maximum expected loading over the 20-year period is minimal. Similarly, the cumulative impact of all other known power plants will not impact significantly on the road pavements as their design has taken such volumes into account. ❖ Traffic Safety - Safety issues may initially be a concern given low traffic volumes as traffic is likely to operate at high speeds in low traffic environments			
INCREASED TRAFFIC VOLUMES	Additional vehicle trips generated by the proposed development (up to 323 and 34 additional trips during the AM and PM peak hours for the construction and operational scenarios respectively) will have minimal impact in terms of road capacity given the current low hourly volumes along the road links and at the affected intersections, and low trips generated by the proposed power plant.	**DIRECT**	**LOW -**	**LOW -**
	It is assumed that all proposed plants will be operational by 2030. As such, the TIA has assessed the cumulative operational traffic for the Zone 10 South and North power plants, the Zone 13 power plant and the Liquified Natural Gas terminal and distribution facility added to the latent volumes and the ENGIE Zone 13 plant and the escalated background traffic volumes for the 2030 development horizon	**CUMULATIVE**	**NO IMPACT**	
	The No-Go option would not result in any impacts	**NO-GO**	**NO IMPACT**	
ADDITIONAL AXLE LOADING RESULTING IN DETERIORATION OF ROAD CONDITION	The Coega SEZ Demand Modelling Report indicates that all Class 2 roads would likely need to accommodate 7.5 million E80s per lane over a 20-year period. Given that the Ring Road is a class 2 road it has likely been designed for these volumes. As such the number of E80s generated by the power plant traffic relative to the maximum expected loading over the 20-year period is minimal	**DIRECT**	**LOW -**	**LOW -**
	The cumulative impact of all other known power plants will not impact significantly on the road pavements as their design has taken such volumes into account.	**CUMULATIVE**	**LOW -**	**LOW -**

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	The No-Go option would not result in any impacts	**NO-GO**	**NO IMPACT**	
TRAFFIC SAFETY IMPACT DUE TO ADDITIONAL / HIGH-SPEED TRAFFIC	Safety issues may initially be a concern given low traffic volumes as traffic is likely to operate at high speeds in low traffic environments.	**DIRECT**	**LOW -**	**LOW -**
	It is assumed that all proposed plants will be operational by 2030. As such, the TIA has assessed the cumulative operational traffic for the Zone 10 South and North power plants, the Zone 13 power plant and the Liquified Natural Gas terminal and distribution facility added to the latent volumes and the ENGIE Zone 13 plant and the escalated background traffic volumes for the 2030 development horizon	**CUMULATIVE**	**LOW -**	**LOW -**
	The No-Go option would not result in any impacts	**NO-GO**	**NO IMPACT**	
TERRESTRIAL ECOLOGICAL IMPACT ASSESSMENT				
LOSS OF INDIGENOUS VEGETATION	Vegetation clearance for the construction of the proposed pipeline will result in the approximate loss of 4.42 ha of Grassridge Bontveld and 0.14 ha of Sundays Valley Thicket. The clearance of vegetation for the construction of both the proposed pipeline and LNG hub site will result in the approximate loss of 19.85 ha of St Francis Dune Thicket and 11.25 ha of Cape Seashore Vegetation. Based on the current remaining extent (NBA 2018), the proposed development is expected to alter less than 1% of these vegetation types.			
	Consequently, due to the relatively small size of expected alteration (36,06 ha in total) and the small percentage loss (< 1%) of vegetation relative to remaining extent and combined with the ecological sensitivity of each vegetation type, this impact is rated moderate negative.	**DIRECT**	**MODERATE -**	**LOW -**
	Due to the relatively small percentage loss (< 1% in total) of vegetation expected from the proposed development, relative to the remaining extent of each vegetation type, this impact is rated low negative	**CUMULATIVE**	**LOW -**	**LOW -**
	The project area, particularly areas of St Francis Dune Thicket, is infested with A. cyclops while and sand mining is taking place on the dunes. This has resulted in the alteration of indigenous habitat. This, amongst other land uses in the SEZ, will likely continue to alter native habitat	**NO-GO**	**MODERATE -**	**N/A**
LOSS OF SENSITIVE SPECIES HABITAT	Certain sensitive habitat (i.e., Damara Tern Colony and Rare Butterfly Habitat) and Species of Conservation Concern (i.e., *Aloides clarki*, *Marsilea schelpeana*) habitats occurring within the project area have been delineated and declared no-go areas.			

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	Should construction activities encroach on these areas, the impact associated with the loss of sensitive habitat and/or SCC would be high. However, if the recommended mitigation measures and buffers are implemented, the impact on these areas would be low	**DIRECT**	**HIGH -**	**HIGH -**
	Sand mining has already replaced sensitive habitat within the project area, including sections of Damara Tern habitat in Zone 10 of the SEZ. However, there will be no additional loss of sensitive habitat and/or species associated with the construction of the proposed development if they are treated as no-go areas.	**CUMULATIVE**	**NO IMPACT**	
	If the proposed development does not go ahead, the current impacts associated with sand mining and the infestation of invasive alien plants will continue to replace sensitive habitat in Zone 10. As such, the No-go Alternative is rated moderate negative.	**NO-GO**	**MODERATE -**	**MODERATE -**
LOSS OF PLANT SCC	It is possible that four (4) Endangered species (Brunsvigea. litoralis, C.otyledon adscendens, Rapanea. gilliana, E.uryops ericifolius), six (6) Vulnerable species (E.rica chloroloma, G.ymnosporia elliptica, Agathosma. stenopetala, Erica. glumiflora, O.thonna rufibarbis and S.alvia obtusata), and one (1) Near Threatened species (P.soralea repens) that may occur within the project area.			
	Due to the high number of rare, endemic, or threatened species in the project area, the loss of SCC is rated high negative.	**DIRECT**	**HIGH -**	**MODERATE -**
	SCC have likely already been lost because of existing land uses such as sand mining and alien plant infestation in the project area. As such, the potential loss of SCC associated with the proposed development would contribute to the further loss of SCC within the project area. However, if the mitigation measures outlined in this report are implemented and adhered to, this impact can be reduced to low negative.	**CUMULATIVE**	**MODERATE -**	**LOW -**
	If the proposed development does not go ahead, the current impacts associated with sand mining and the infestation of invasive alien species in Zone 10 will continue to displace plants, including SCC. As such, the No-go Alternative is rated moderate negative.	**NO-GO**	**MODERATE -**	**LOW -**
LOSS OF HERPETOFAUNA AND HABITAT	During the construction phase, construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil, and the movement of construction vehicles) could result in wildlife mortalities through road kills or accidental killing, and/or cause the displacement of herpetofauna via increased noise or air pollution. Additionally, the loss of vegetation/soil due to clearance will result in the direct loss of faunal habitat, which will directly, and indirectly, impact on amphibians and reptiles adapted to their ground dwelling habitats. Reptiles also face a high risk of being poached in the wild, and the increase in individuals associated with the construction of the proposed development could create poaching opportunities. Moreover,			

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	Sensitive Species 18 is restricted to Bonteveld vegetation and has a high risk of being affected by construction (and operation) activities. As such, this impact is rated high negative	**DIRECT INDIRECT**	**HIGH -**	**MODERATE -**
	The proposed development will likely exacerbate current impacts (e.g., road activity) on amphibians and reptiles within the project area and may exacerbate the loss of protected reptile species through increased poaching opportunities. The additional clearing of vegetation reduces habitat further, resulting in displacement.	**CUMULATIVE**	**MODERATE -**	
	If the proposed development does not go ahead, the current impacts associated with other activities in the area, such as sand mining, also pose a threat to herpetofauna SCC. As such, the No-go Alternative is rated moderate negative.	**NO-GO**	**MODERATE -**	
LOSS OF MAMMALS AND HABITAT	Construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil and the movement of construction vehicles) could result in wildlife mortalities through road kills or accidental killing, and/or cause the displacement of mammals via increased noise or air pollution. Additionally, the loss of vegetation/soil due to clearance will result in the direct loss of faunal habitat, which will directly, and indirectly, impact on small sedentary species adapted to their ground dwelling habitats. Larger more agile species such as antelope are likely to disperse to more suitable habitats away from construction areas. As such, this impact is rated moderate negative			
	Construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil and the movement of construction vehicles) could result in wildlife mortalities through road kills or accidental killing, and/or cause the displacement of mammals via increased noise or air pollution.	**DIRECT**	**MODERATE -**	**LOW -**
	The addition of the proposed development may exacerbate current impacts on mammals within the project area due to existing developments (e.g., sand mining). This could exacerbate the loss of mammal SCC through increased poaching opportunities or road kills. However, mammals are relatively agile and can move away from construction areas to more suitable habitat. Therefore, the cumulative impact is rated low negative.	**CUMULATIVE**	**LOW -**	
	If the proposed development does not go ahead, the current impacts associated with other activities in the area, such as sand mining, also pose a threat to mammal SCC. As such, the No-go Alternative is rated low negative.	**NO-GO**	**LOW -**	
LOSS OF CBA (OSMP)	The construction of the proposed pipeline will result in the loss of approximately 0.14 ha of intact Sundays Valley Thicket, which in the OSMP spatial dataset (2014) directly translates to CBA - IDZ. The category of CBA – IDZ is driven by the vegetation type (i.e., Mesic Succulent Thicket), Species of Special Concern,			

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	and long-term conservation commitments. According to the OSMP, development in these areas should be avoided, however certain linear infrastructure such as a pipeline) could be allowed, but this should preferably either be put underground or above vegetation. Disturbed land should be rehabilitated after construction to ensure a continuous system is maintained.			
	Due to the relatively small size of the pipeline within the CBA (~0.14 ha) and the type of activity (i.e., linear), this impact is rated moderate negative.	**DIRECT**	**MODERATE -**	**LOW -**
	The added loss of 0.14 ha of CBA – IDZ due to the proposed pipeline will contribute to the cumulative loss of CBA – IDZ within the SEZ, which may affect long-term conservation commitments. However, as loss is minimal the cumulative impact is rated low negative	**CUMULATIVE**	**LOW -**	
	The No-go alternative will not result in the loss of CBA - IDZ. However, it should be noted that current land uses such as alien plant infestation, sand mining, and roads in Zone 10 have encroached on CBA – IDZ, including Damara Tern Habitat. As such the No-go alternative is rated moderate negative.	**NO-GO**	**MODERATE -**	**LOW -**
LOSS OF AQUATIC ESA	The construction of the proposed development will result in the loss of approximately 32.06 ha of Aquatic ESA (ECBCP, 2019). ESAs extend into catchments that are essential for the maintenance of CBA rivers and wetlands.			
	With the recommended 32m buffer around rivers and wetlands in the project area, combined with the relatively small footprint of the development (32.06 ha), it is unlikely that the proposed development will have a significant impact on nearby rivers and/or wetlands. As such, the significance of this impact is rated low negative.	**DIRECT INDIRECT**	**LOW -**	**LOW -**
	The construction of the proposed development will likely contribute to the cumulative loss of Aquatic ESA in the Coega SEZ. However, this loss is expected to be minimal (> 1 ha). As such, the cumulative impact is rated low negative.	**CUMULATIVE**	**LOW -**	
	The No-go alternative will not result in the loss of Aquatic ESA. However, it should be noted that current land uses such as alien plant infestation and sand mining in Zone 10 will continue to degrade Aquatic ESA in the SEZ. As such the No-go alternative is rated moderate negative.	**NO-GO**	**MODERATE -**	
DISRUPTION OF ECOSYSTEM FUNCTION AND PROCESS	Coastal Dune System: ❖ Development within the coastal dune system will alter the natural dynamic processes characteristic of the coastal zone, including sediment dynamics and windblown sediment transport, ultimately resulting in the modification of the dune system and changes to the coastal sediment budget in the region. Albany Thicket System: ❖ Development within Bontveld and to a lesser extent Sundays Valley Thicket, may cause changes to fire dynamics (e.g., due to increased vehicular use and traffic in the Construction (and Operation) Phase and/or the proliferation of grasses in disturbed areas, amongst other factors.			

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	❖ ?			
	Due to this impact being restricted to the affected areas, this impact is rated moderate negative before mitigation.	**DIRECT**	**MODERATE -**	**LOW -**
	Disruption of ecosystem function and process due to habitat degradation and/or fragmentation has likely already occurred within the project area due to alien plant infestation, sand mining, and road activity, amongst other land uses. The construction of the proposed development may thus cause additional disruption(s).	**CUMULATIVE**	**MODERATE -**	
	Under the No-go alternative, habitat degradation and/or fragmentation which could disrupt ecosystem dynamics will likely still occur because of other land uses such as sand mining. Under the No-go alternative the impact is therefore rated moderate negative.	**NO-GO**	**MODERATE -**	
HABITAT FRAGMENTATION AND/OR DEGRADATION	During the Construction Phase, the loss of vegetation associated with the proposed development will coincide with the loss of faunal habitat, thereby reducing breeding and rearing locales.			
	Faunal populations could become locally extinct or diminish in size. However, as the development is linear in nature and there is sufficient suitable habitat surrounding the proposed servitude, this impact is rated moderate negative.	**DIRECT**	**MODERATE -**	**LOW -**
	Habitat degradation and/or fragmentation has already occurred within the project area due to alien plant infestation, sand mining, and road activity, amongst other land uses. The construction of the proposed development will thus cause additional habitat fragmentation and/or degradation.	**CUMULATIVE**	**MODERATE -**	
	Under the No-go alternative, habitat degradation and/or fragmentation will still occur because of other land uses such as sand mining. Under the No-go alternative the impact is therefore rated moderate negative	**NO-GO**	**MODERATE -**	
ESTABLISH-MENT AND/OR SPREAD OF ALIEN PLANT SPECIES	The removal of existing natural vegetation creates 'open' habitats which favours the establishment of undesirable vegetation in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems. Alien invasive species already present on site include *Acacia cyclops* (Rooikrans).			
	Establishment and spread of alien invasive vegetation	**DIRECT**	**MODERATE -**	**LOW -**
	Pockets of alien invasive vegetation, namely *Acacia cyclops,* has already established in the project area, particularly in St Francis Dune Thicket. Should construction of the proposed development take place, this could lead to the additional spread of alien invasive species in the project area, which would exacerbate	**CUMULATIVE**	**MODERATE -**	

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	the current and land use. As such, the cumulative impact is rated moderate negative.			
	The site is already invaded with *Acacia cyclops* which has resulted in the alteration of habitat, particularly St Francis Dune Thicket. If the project does not go ahead, this infestation is still likely to spread. The current impact under the no-go alternative is therefore rated moderate negative.	**NO-GO**	**MODERATE -**	
OPERATIONAL PHASE				
AIR QUALITY IMPACTS				
For the Gas Infrastructure, the main sources of point source emissions include the Heater Stack, the generators via a combined stack, and the four stacks on a typical LNG carrier. Emissions from LNG handling and storage during start-up are considered to be negligible. Storage and loading of LNG or NG from the Land-based LNG Terminal and Infrastructure Project generates negligible emissions as the fuel is kept at extremely low temperatures. Any gas that may escape will be returned to the storage unit. The Air Quality Assessment found that the main sources of fugitive emissions include: ❖ the LNG resupply vessels during their transit from the eastern breakwater to the berthing area and ❖ The LNG Truck Loading Facility and associated road infrastructure. Impacts resulting from the Land-based LNG Terminal and Infrastructure Project are summarised as follows: ❖ For SO2, NO2, CO and PM10 the extent of the potential impact is very small and limited to the SEZ. Benzene emissions are not expected, and the potential impact is therefore irrelevant ❖ The predicted ambient concentrations of SO2, NO2, CO and PM10 emissions from the Gas Infrastructure Project are very low and the intensity is rated as irrelevant ❖ Any impact will endure for the life of the operation. The duration is therefore long term ❖ The consequence of the potential impact is therefore very low for SO2, NO2, CO and PM10 and irrelevant for benzene ❖ The intensity is very low, so air quality impacts are improbable ❖ The significance rating is therefore considered insignificant for SO2, NO2, CO and PM10 ❖ Air pollutants may have negative health effects even at low concentration. The status of the impact is therefore negative. Air quality management interventions to reduce emissions from the Gas Infrastructure are deemed to be unnecessary considering the low impact of the project on air quality.			

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However ambient monitoring and dispersion modelling show that current baseline ambient concentrations of SO2 and NO2 in the Coega SEZ are generally low, although there are some areas where NO2 exceedances occured.				
IMPACT ON AMBIENT SO2, NO2 AND PM10 CONCENTRATIONS	The predicted ambient concentrations of SO2, NO2, CO and PM10 emissions from the Gas Infrastructure Project are very low and the intensity is rated as irrelevant	**DIRECT**	**LOW -**	**LOW -**
	For SO2, NO2 and PM10, the extent of the potential impact is small and limited to the SEZ. The cumulative effect in the SEZ will therefore be very small or negligible	**CUMULATIVE**	**LOW -**	
	The No-Go option will not impact air quality within the Coega SEZ further	**NO-GO**	**NO IMPACT**	
IMPACT ON AMBIENT CO CONCENTRATIONS DURING OPERATION	The consequence of the potential impact is therefore very low for SO2, NO2, CO and PM10 and irrelevant for benzene. The intensity is very low, so air quality impacts are improbable. The significance rating is therefore considered insignificant for SO2, NO2, CO and PM10	**DIRECT**	**LOW -**	**LOW -**
	For CO and benzene the predicted cumulative concentrations are very low and the extent of any potential impact is regarded as irrelevant.	**CUMULATIVE**	**LOW -**	
	The No-Go option will not impact air quality within the Coega SEZ further	**NO-GO**	**NO IMPACT**	
CLIMATE CHANGE IMPACTS				
A high-level GHG inventory was developed for the proposed Gas distribution infrastructure, to quantify its impacts on climate change. This GHG inventory estimated the emissions associated with the operation and value chain (both upstream and downstream) of the proposed project. The GHG inventory was assessed in comparison to a calculated South African carbon budget, which, in turn, informed the impact assessment conducted in this CCIA. The South African carbon budget was used to benchmark the emissions to be released by the proposed Gas Distribution Infrastructure. Emissions are presented in tonnes of CO2 equivalents (CO2e), and take into consideration the Global Warming Potential (GWP) of all emitted greenhouse gases over 100 years. The included gases are CO2, CH4 and N2O. The GWP of any GHG is the amount of heat absorbed per mass unit of a GHG divided by the amount of heat an equivalent amount of CO2 would absorb over the specified period.				
IMPACT ON CLIMATE CHANGE (GHG EMISSION)	The total annual emissions (Scope 1, 2 and 3) are 28.5 million tCO2e per annum and the total GHG Inventory across the lifetime of the Gas Distribution Infrastructure is 855 million tCO2e. These emissions equate to 19.4% of South Africa's carbon budget. 72% of the emissions across all scopes of the Gas Distribution Infrastructure occur within South Africa (20.5 million tCO2e emissions annually). This equates to 615 million tCO2e emissions in South Africa throughout the lifetime of the Gas Distribution Infrastructure. Furthermore, the total emissions associated with the Gas Distribution Infrastructure cover all the emissions associated with the greater Coega Integrated			

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	Gas-to-Power Project proposed by the CDC. All direct emissions from the accompanying gas-to-power plants are covered by the downstream Scope 3 emissions. The upstream Scope 3 emissions of the gas-to-power plants are also covered by the Scope 1 and upstream Scope 3 emissions of the Gas Distribution Infrastructure. Avoided emissions have not been considered in this impact significance rating, however the specialist has noted that the possible emission avoidance could be in the order of 10 million tons of CO2e per annum for the case where a predominantly gas-as-fuel scenario, rather than coal-as-fuel scenario, is considered. The calculation is presented as a possible scenario to illustrate the potential impact that the project could have if there is a shift from coal-as-fuel to gas-as-fuel in industry, due to the lower emission factor associated with the combustion of natural gas when compared to the combustion of coal.			
	The Scope 1 and Scope 2 emissions were summarised into the following categories: Tanker Berthing and Deberthing; and LNG Regasification. With an assumed project life span of 30 years10, this amounts to 26 million tCO2e throughout the lifespan of the Gas Distribution Infrastructure project. These emissions are related to a total annual throughput of 16.9 million m3 of LNG per year. The Scope 1 and Scope 2 emissions equate to 0.56% of South Africa's carbon budget	**DIRECT**	**LOW -**	**LOW -**
	The upstream Scope 3 emissions (from natural gas extraction, transport, processing and liquefication) amount to a total of 8.0 million tCO2e per annum. The most significant portion of Scope 3 emissions, and of the entire project, is the downstream Scope 3 emissions which are 19.6 million tCO2e per annum, which are related to the combustion of the imported LNG for various processes, including, but not limited to, the combustion emissions arising from the three proposed CDC gas-to-power plants.	**INDIRECT**	**VERY HIGH -**	**VERY HIGH -**
	For the climate change impact assessment (in terms of the Thabametsi case judgement), greenhouse gas emissions are quantified to determine the impact of a project on climate change. Since the project impact on climate change (the project's greenhouse gas emissions) cannot be directly linked to local impacts, it is not possible to determine / quantify cumulative impacts associated with other Gas to Power projects within a 30 km radius of the site. The CCIA did however consider the cumulative nature of climate change, by contextualising impact in terms of the global carbon budget, and on a national level by using the South African carbon budget.	**CUMULATIVE**	**N/A**	
	The No-Go option is not expected to impact upon climate change in any significant manner	**NO-GO**	**NO IMPACT**	

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RISK AND VULNERABILITY OF THE PROJECT TO CLIMATE CHANGE	Several climate change impacts could affect the core operations of the Gas Distribution Infrastructure. These impacts mostly affect the structural integrity of the equipment and installations. The health and safety of employees as well as their performance could also be significantly impacted, mostly due to increasing average temperatures and reducing water security. The climate change impacts that are likely to have severe impacts are associated with the increased frequency and severity of severe weather events, such as severe storms and severe rainfall events. The main outcomes of the risk and vulnerability assessment indicate that the Gas Distribution Infrastructure is resilient to future climate change impacts. The Port of Ngqura has already taken impacts such as sea level rise and increased storm surge into account during its design, whilst the insulation of pipelines and storage units of the Gas Distribution Infrastructure reduces the evaporative losses of liquefied natural gas caused by an increase in average temperature.			
	The Gas Distribution Infrastructure is sensitive to upstream disturbances as a result of Climate Change impacting the reliability of supply of LNG.	**DIRECT**	**LOW -**	**LOW -**
	In terms of the project's vulnerability to climate change, the assessment considers climate change trends impacting both the project and its context. The granularity of this component of the climate change impact assessment relates to a broader area, indicating existing project or contextual risks which could be exacerbated.	**CUMULATIVE**	**NO IMPACT**	
	The No-Go option would result in no impacts as the proposed infrastructure would not exist, and therefore could not be impacted.	**NO-GO**	**NO IMPACT**	
DAMARA TERN IMPACTS				
DISTURBANCE TO DAMARA TERN COLONY (PHASE 1)	Most of the Gas Infrastructure for Phase 1 of the project is located outside of the 700m–1km buffer around the Damara Tern colony. Exceptions are the eastern sections of the Natural Gas and LNG pipelines and the south-east portion of the Road Loading Facility, 550m from the Damara Tern colony. Disturbance from operations outside of this buffer, including operations of the FSRUs at the Port of Ngqura, are not expected to have an impact on the sustainability of the Damara Tern colony. The impact rating due to Disturbance during Phase 1 Operations is consequently based on activities planned within the 700m-1 km buffer around the Damara Tern colony. For Phase 1 (road loading facility, weighbridge and presumably some administrative offices), no large structures are planned and the pipelines will be buried underground. Consequently visual impacts of permanent structures from the Damara Tern colony are expected to be low. Lighting (for operations and security), movement of personnel and especially gas transport trucks (including the impact of headlights at night) is very likely to have an impact on the colony if not controlled and mitigated.			

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
	The negative impact of disturbance during operations of Phase 1 of the Gas Infrastructure on the Damara Tern colony is assessed to be Moderate, reducing to Low following successful implementation of mitigation measures. The cumulative impact of disturbance on the Damara Tern colony, comprising noise, the presence of large physical structures, lighting and general disturbance caused by human activities, vehicle and equipment movements at the two Zone 10 Power Plants and Gas Hub during the operational phase of the Integrated Gas to Power Project is assessed. Disturbance impacts on the Damara Tern colony during the operational phase of the Integrated Zone 10 Gas to Power Facilities due to noise, the visual intrusion and physical presence of the two Power Plants and Gas Hub with associated lights, movement of vehicles, machinery and people are assessed to be High Negative. The Residual Impacts after implementation of on-site mitigation measures are assessed to remain High Negative as mitigation will be very difficult and the physical presence and size of the proposed Zone 10 Gas to Power Facilities cannot be mitigated. The No-Go Alternative prior to mitigation assessed the impact of past and future sand mining (assuming that the 35ha Coega Mining Right will be fully mined) as Moderate Negative. The impact is fully reversible by ceasing sand mining once the current 5ha Ngqura Sand Mine is exhausted (probably within the next 2 years) and not commencing with mining of the Coega Mining Right, resulting in a Low Negative impact after mitigation. However, this mitigation is very unlikely to be implemented and consequently the impact of the No-Go Alternative is considered to be Moderate Negative.	**DIRECT**	**MODERATE -**	**LOVW -**
		CUMULATIVE	**HIGH -**	**HIGH -**
		NO-GO	**MODERATE -**	**LOW -**
CONSTRUCTION DISTURBANCE TO DAMARA TERN COLONY (PHASE 2)	The Gas Infrastructure required for Phase 2 of the project is mostly located in the south-east portion of the Gas Hub, 200m-550m from the Damara Tern colony. The infrastructure includes large structures including a regasification facility, two 160,000 m3 LNG Storage Tanks and a tall stack vent (Figure 5-1; Figure 2-2). The impact rating due to disturbance during construction of Phase 2 infrastructure is consequently based on the Phase 2 construction activities planned within the Gas Hub as these impacts will outweigh other developments further from the colony. Likely disturbance impacts include visual impacts, noise, lighting and movement of personnel and construction machinery.			

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
	The negative impact of disturbance during operations of Phase 2 of the Gas Infrastructure on the Damara Tern colony is assessed to be High. The close proximity of the Damara Tern colony and the size of the infrastructure means that the impacts will be difficult to mitigate and the impact remains High Negative after mitigation. The cumulative impact of disturbance on the Damara Tern colony, comprising noise, the presence of large physical structures, lighting and general disturbance caused by human activities, vehicle and equipment movements at the two Zone 10 Power Plants and Gas Hub during the operational phase of the Integrated Gas to Power Project is assessed. Disturbance impacts on the Damara Tern colony during the operational phase of the Integrated Zone 10 Gas to Power Facilities due to noise, the visual intrusion and physical presence of the two Power Plants and Gas Hub with associated lights, movement of vehicles, machinery and people are assessed to be High Negative. The Residual Impacts after implementation of on-site mitigation measures are assessed to remain High Negative as mitigation will be very difficult and the physical presence and size of the proposed Zone 10 Gas to Power Facilities cannot be mitigated. The No-Go Alternative prior to mitigation assessed the impact of past and future sand mining (assuming that the 35ha Coega Mining Right will be fully mined) as Moderate Negative. The impact is fully reversible by ceasing sand mining once the current 5ha Ngqura Sand Mine is exhausted (probably within the next 2 years) and not commencing with mining of the Coega Mining Right, resulting in a Low Negative impact after mitigation. However, this mitigation is very unlikely to be implemented and consequently the impact of the No-Go Alternative is considered to be Moderate Negative.	**DIRECT**	**HIGH -**	**HIGH -**
		CUMULATIVE	**HIGH -**	**HIGH -**
		NO-GO	**MODERATE -**	**LOW -**
IMPACTS TO DAMARA TERNS DUE TO DUNEFIELD SAND STARVATION	The construction of the Port of Ngqura that became operational in September 2009 appears to have drastically decreased the volume of sand entering the dunefield from the beach and Dove Sand Mine removed most of the mobile sand west of the Damara Tern colony during 2016-18. The entire dunefield is moving in a north-easterly direction under the influence of the prevailing south-westerly winds at a rate of up to 20m per year (Martin 2019, 2021). To date approximately 50% (50ha) of the original dune area has been mined and a further 30% (35ha) is expected to be mined over the next 15 years. The impact of dunefield sand starvation on the Damara Tern colony due to mining was assessed to be High reducing to Medium after mitigation (Martin 2019). The marine intake and outfall servitude downwind of the Damara Tern colony will further reduce sand entering the dunefield by obstructing the coastal and hummock dune sand transport corridor and the EIA for the marine servitude project assessed impacts on the dune system to be High reducing to Moderate after mitigation (CES 2021). The Zone 10 Gas to Power Projects especially the Zone 10S Power Plant are likely to further reduce sand transport into the dunefield.			

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
	No direct/indirect impacts assessed of any significance.	**DIRECT**	**NO IMPACT**	
	The Cumulative Impact of reduced sand transport into the dunefield, thereby reducing the area of habitat available for Damara Tern breeding is assessed to be High reducing to Moderate after mitigation. The no-go option would result in the continuation of mining within the Zone 10 mining right area and the loss of an estimated additional 15% of the dune system's sand resource.	**NO-GO CUMULATIVEE**	**HIGH -**	**MODERATE -**
NOISE IMPACTs				
NOISE AFFECTING NEARBY RECEPTORS	The modelling results show that no NSAs will be impacted from the noise levels emitted during the operational phase. This is because the noise levels will be below the ambient noise levels and thus be masked. The predicted operational noise levels of the proposed project are below the SANS 10103 recommended levels for the human receptors within the SEZ and at the SEZ boundary.			
	The noise impact associated with the operational activities of Gas Infrastructure is predicted to be of very low significance before mitigation on the Port of Ngqura and CDC tenants, well as ecological receptors.	**DIRECT**	**LOW -**	**LOW -**
	The cumulative levels show that several NSAs will be impacted by the noise that arises during the operational phase from all components of the project. The high intensity rating of the predicted noise levels when all components of the CDC Gas to Power project are considered is due to ecological receptors (Damara Tern colony) in Zone 10 that may be affected by noise resulting cumulatively from the proposed projects in that area.	**CUMULATIVE**	**HIGH -**	
	The No-Go option would result in the continuation of current mining activities and the subsequent continuation of the noise impacts thereof on the Damara Tern colony.	**NO-GO**	**MODERATE -**	

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
SAFETY RISK IMPACTS				
Accidental leaks of LNG could occur and result in a vapour cloud. The vapour cloud is quickly vaporised, however if an ignition source is present this can cause a fire which burns back to the source. The storage and handling of LNG (and other hazardous substances) may be considered to be a Major Hazard Installation (MHI) in terms of the Occupational Health & Safety Act. A The main hazards that would occur with a loss of containment of hazardous components at the proposed project include exposure to: ❖ Thermal radiation from fires; ❖ Overpressure from explosions. ❖ Hazardous materials stored on the site and taken into account in the QRA are as follows: ❖ LNG and Natural Gas (predominantly methane), at the FSRU(s) and onshore storage Natural gas consists mostly of methane, which is a flammable gas at atmospheric conditions. Economical transportation of natural gas would require liquefying the gas so that it would occupy less volume by weight. Methane (compressed) is listed as a notifiable substance at a threshold value of 15t. The schedule does not specifically mention LNG, which would be in the liquid state and not compressed, and therefore LNG would not be classified as a notifiable substance. Given the flammable and potentially explosive nature of natural gas, fires and vapour cloud explosions represent the primary hazards associated with the transfer of the gas. The gas is a fire and explosion hazard when it is exposed to heat and flame. This study concentrated on the loss of containment of natural gas, refrigerated and at elevated pressure from the LNG carrier to the end destination.				
LOSS OF CONTAINMENT OF LNG DURING OPERATION OF FSRUs	The risks from the FSRU will remain within the Port of Ngqura and the Coega SEZ and would not impact the general public outside of this area. For this reason, the project would not be considered a Major Hazard Installation.			
	The impact is rated to have a high consequence rating, but low probability of occurring, resulting in a medium significance rating (with and without mitigation), with medium confidence (due to uncertainties in rating of impacts resulting from risks).	**DIRECT**	**MODERATE -**	**LOW -**
	Leaks or spills of LNG and / or natural gas from various components of the Gas Infrastructure (LNGC, FSRU, pipelines, onshore storage tanks, etc.), as well as from other developments in the area, may result in fires and explosions, which may have fatal consequences.	**CUMULATIVE**	**NO IMPACT**	
	The No-Go option will not result in any impacts related to loss of containment of LNG.	**NO-GO**	**NO IMPACT**	

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
LOSS OF CONTAINMENT OF LNG DURING OPERATION OF LNG & GAS HUB	The extent from fires and explosions could extend considerable distances, particularly at low windspeeds. However, the risks would remain within the Port of Ngqura and the Coega SEZ and would not impact the general public outside of this area. For this reason, the project would not be considered a Major Hazard Installation.			
	The impact is rated to have a high consequence rating, but low probability of occurring, resulting in a medium significance rating (reduced to very low with mitigation), with medium confidence (due to uncertainties in rating of impacts resulting from risks).	**DIRECT**	**MODERATE -**	**LOW -**
	Leaks or spills of LNG and / or natural gas from various components of the Gas Infrastructure (LNGC, FSRU, pipelines, onshore storage tanks, etc.), as well as from other developments in the area, may result in fires and explosions, which may have fatal consequences.	**CUMULATIVE**	**NO IMPACT**	
	The No-Go option will not result in any impacts related to loss of containment of LNG.	**NO-GO**	**NO IMPACT**	
MARINE ECOLOGICAL IMPACTS				
Other than the unplanned event of a vessel accident or the release of large volumes of diesel into the marine environment, the impacts of MEDIUM significance relate primarily to short-term construction impacts, the introduction and spread of non-native marine species and impingement and entrainment effects resulting from the intake of large volumes of seawater from the Port for the purposes of re-gasification, cooling and ballasting. Whereas the introduction of non-native marine species is a cosmopolitan problem in all ports, the intake of large volumes of water from a relatively confined and sheltered waterbody such as a port warrants further consideration, especially when the port has been identified as supporting one of the most abundant and diverse fish populations along the South African coastline, and functioning as an important habitat for both juvenile and adult fish many of which are considered 'vulnerable', 'endangered' and 'critically endangered'.				
LOSS OF BENTHIC COMMUNITIES	In the case of the heating and cooling water discharges from the LNGC and FSRU, structural adaptations can be implemented to the vessels outlets thereby avoiding impacts to the sediments below the vessels. Furthermore, the negative impacts persist over the short-term only recolonization of unconsolidated sediments will be rapid and the new structures and rock armouring will offer a new settling ground for hard bottom species and will be rapidly colonised.			
	The initial negative impacts are deemed of low intensity within the immediate vicinity of the LNG terminal and dredge disposal site. The impact is therefore assessed to be of very low significance both without and with mitigation	**DIRECT**	**LOW -**	**LOW -**
	Cumulative impacts during operation are considered low intensity and locally contained.	**NO-GO / CUMULATIVE**	**MODERATE -**	**MODERATE -**
REDUCED PHYSIOLOGICAL FUNCTIONING OF MARINE	Sediment resuspension and increased turbidity may occur during operation as a result of discharge of heating and cooling water from the LNGC and FSRU (depending on discharge depth and velocity) during operation. Impacts on marine organisms are related to the concentration of suspended material and duration of exposure to it, and range from reduced visibility for feeding, clogging of gills, diminished light penetration affecting photosynthetic capability of aquatic plants.			

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
ORGANISMS	Impacts are considered to be highly localised and ephemeral, and therefore the impact is assessed to be of very low significance both without and with mitigation.	**DIRECT**	**LOW -**	**LOW -**
	Although increased suspended sediment concentrations assessed are ephemeral, when taken in combination with capital and maintenance dredging operations, cumulative impacts on water quality of medium significance can be expected over the medium to long term.	**NO-GO / CUMULATIVE**	**MODERATE -**	**MODERATE -**
DISTURBANCE TO MARINE FAUNA	Changes and avoidance of feeding and/or breeding areas in fish, seabirds, seals, turtles and cetaceans due to underwater noise from the LNGCs and FSRU.	**DIRECT**	**LOW -**	**LOW -**
	The long term cumulative impacts of noise on marine organisms in the port are therefore predicted to be of medium significance.	**NO-GO / CUMULATIVE**	**MODERATE -**	**MODERATE -**
CREATION OF ARTIFICIAL SUBSTRATA	The creation of artificial hard substrata through the placement of revetments and rock armour, and the installation of piles is thus deemed to be of low intensity. The impact can be considered positive as the developing successional biofouling communities would serve as a food source for reef-associated fish and invertebrate species thereby potentially enhancing the biodiversity and abundance in the port.	**DIRECT**	**LOW +**	**LOW +**
	Any developments within the port that require the installation of hard structures will have a cumulative impact on the availability of hard substrata for colonisation by marine organisms. The long term cumulative impacts are, however, expected to be of low significance.	**NO-GO / CUMULATIVE**	**LOW +**	**LOW +**
INTAKE OF LARGE VOLUMES OF SEAWATER FROM THE PORT	The operation of the FSRU is estimated to require a seawater flow rate of 45,000 – 600,000 m^3/day for the vaporisers, cooling water and onboard desalination, which will be taken in directly from the port. The LNGCs will also require water for engine cooling and to protect the vessel from damage during LNG transfer and regasification, and both vessels would have a ballast control system to maintain vessel stability during cargo transfer.			
	The impingement and entrainment of marine organisms through the intake of large volumes of seawater by the LNGC and FSRU for ballasting and heating and cooling of onboard processes is deemed to potentially be of medium intensity. The effect will be highly localised but would continue over the medium- (FSRU and LNGC) to long-term (LNGC only) and is assessed to be of medium significance.	**DIRECT**	**MODERATE -**	**LOW -**
	With the proposed development of multiple gas-to-power projects within the port and in the Coega CDC large volumes of seawater will be required for both cooling and regasification. Any impingement and entrainment effects will therefore be cumulative, potentially extending over the long term.	**CUMULATIVE**	**MODERATE -**	
	The No-Go option would result in no impacts occurring.	**NO-GO**	**NO IMPACT**	

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
INTRODUCTION AND SPREAD OF MARINE ALIEN INVASIVE SPECIES	The operation of the ballast control system in the FSRU and LNGC, as well as bio-fouling organisms on the hulls of LNGCs from outside South African waters may result in introduction of species not naturally found in the area. These may be in the form of larvae, eggs, cysts, or adult organisms, using the vessel hull as substrate.			
	The introduction and spread of non-native species through hull fouling or ballast water discharge by the LNGC and FSRU is deemed to potentially be of medium intensity. As the LNGCs would, however, not be de-ballasting in the Port, it is improbable that non-native species would be introduced through ballast water, although they may still be introduced through hull fouling. The impact is thus assessed to be of medium significance without mitigation.	**DIRECT**	**MODERATE -**	**LOW -**
	Any further port developments that result in an increase in vessel traffic to and from the port will result in an increased risk in the introduction of non-native marine organisms. The long term cumulative impacts of the introduction and spread of alien species are difficult to predict with confidence, but could be of medium to high significance (depending on the species involved and its invasive abilities).	**CUMULATIVE**	**MODERATE -**	**MODERATE -**
	The No-Go option will likely not reduce the regular movement of maritime traffic and the impact is therefore the no-go option is rated similar to the direct impacts assessed above.	**NO-GO**	**NO IMPACT**	
DISCHARGE OF HIGH VOLUMES OF WATER WITH DEPRESSED OR ELEVATED TEMPERATURES	Changes in water temperature resulting from thermal water discharges from the LNGC and FSRU during operation can have a substantial impact on aquatic organisms and ecosystems, in terms of physiology oof biota, localised changes in behaviour, or influences om ecosystem functioning.			
	Based on the results of modelling studies from elsewhere, the discharge of thermal effluents from the FSRU moored at the proposed LNG terminal in the Port of Ngqura would be of low intensity and remain localised to within 100 m of the vessel and to within the port. The negative impacts would, however, persist over the medium-term (assuming the FSRU operations are replaced by land-based LNG storage and re-gasification facilities within 15 years).	**DIRECT**	**LOW -**	**LOW -**
	A modelling study undertaken by PRDW (2020) for anticipated thermal discharges in the Coega marine pipeline servitude ascertained that water quality guideline targets with respect to temperature were met within 300 m of the proposed discharge location to the east of the breakwater. There would therefore be no overlap of the thermal plumes from the FSRU moored at the LNG terminal within the Port, with the thermal discharges from the power-plant outfalls to the east of the breakwater and within the Addo Elephant MPA and Algoa Bay to Amathole EBSA. If the thermal plumes are limited to within 100 m of the discharge point, there will also unlikely be cumulative impacts between the thermal discharges from the FSRU and proposed Engie FSU to be situated a few 100 m south along the breakwater. Cumulative impacts of thermal discharges are thus not expected.	**CUMULATIVE**	**LOW -**	
	The No-Go option would result in no impacts occurring.	**NO-GO**	**NO IMPACT**	

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
DISCHARGE OF CO-POLLUTANTS (BIOCIDE, METALS AND SALINITY)	Disinfection of the pipe and plant system with hypochlorite to prevent fouling of the heat-exchange system of the FSRU, as well as operation of the on-board desalination plant on the LNGC and FSRU, may result in release of heated seawater to the port/			
	The release of trace amounts of chlorine, aluminium and copper in the thermal discharges, and the discharge of small volumes of brine from the onboard desalination plant is considered to be of low intensity and remain highly localised to within a few 10s of metres of the vessel and to within the port. Any impacts would, however, persist over the long-term.	**DIRECT**	**LOW -**	**LOW -**
	No long term cumulative impacts on marine organisms are expected as effluents will comply with water quality guidelines.	**CUMULATIVE**	**NO IMPACT**	
	The No-Go option would result in no impacts occurring.	**NO-GO**	**NO IMPACT**	
INCREASE IN AMBIENT LIGHTING	The project will result in an increase in ambient night time lighting through operation of the LNGC and FSRU may disturb and disorientate pelagic seabirds feeding in the area.			
	The intensity of the impact of an increase in ambient lighting at the LNG terminal is considered low, with effects remaining localised. The impact would, however, endure over the life-time of the terminal.	**DIRECT**	**LOW -**	**LOW -**
	No long term cumulative impacts on marine organisms are expected relative to the ambient light levels in the Coega SEZ.	**CUMULATIVE**	**NO IMPACT**	
	The No-Go option would result in no impacts occurring.	**NO-GO**	**NO IMPACT**	
WASTE DISCHARGES TO SEA	Operation of the LNGC and FSRU at the LNG terminal will result in a reduction of water quality from routine discharges to the sea from vessels.			
	The impacts associated with normal waste discharges from construction activities, the LNG vessels and the LNG terminal are deemed to be of low intensity and would remain localised.	**DIRECT**	**LOW -**	**LOW -**
	Although pollutant levels in the waters of the Port of Ngqura are currently low, compromised water quality within the port over the long-term due to cumulative impacts resulting from port developments, vessel discharges and other anthropogenic sources in the Coega SEZ can be expected. Over the lifetime of the port, these impacts are likely to be of medium significance.	**CUMULATIVE**	**MODERATE -**	
	The No-Go option would result in no impacts occurring.	**NO-GO**	**NO IMPACT**	
ACCIDENTAL SPILLS OF LNG AND/OR HYPOCHLORITE	During operation, accidental spills of LNG may occur during connection and disconnection between the LNGC and FSRU, between the FSRU and onshore unloading arms, leakage from joints, emergency disconnection or rupture of the ship's containment system, or casualty / collision of the LNGC.			

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
	During operation, spills of sodium hypochlorite (used or disinfection against biofouling) on the offloading platform may occur. As marine organisms are extremely sensitive to residual chlorine, a spill of concentrated hypochlorite solution into the marine environment at the generation unit would likely have lethal or sublethal effects on the biota in the area affected by the spill.			
	The impacts associated accidental spills are deemed to be of low-medium intensity and would remain localised. The impacts would persist over the short-term only.	**DIRECT**	**LOW -**	**LOW -**
	No long term cumulative impacts on marine organisms are expected relative to the ambient light levels in the Coega SEZ.	**CUMULATIVE**	**NO IMPACT**	
	The No-Go option would result in no impacts occurring.	**NO-GO**	**NO IMPACT**	
FAUNAL STRIKES WITH LNGCS AND DREDGERS	The movement of LNGCs to and from the LNG terminal area may result in collisions, propellor injuries, behavioural disturbance, physiological injury or mortality to marine mammals, turtles, and fish species.			
	As project-associated vessels will be travelling at low speeds the likelihood of a vessel strike is very low improbable). However, should strikes occur, the impacts would be of high intensity for individuals but of LOW intensity for the population as a whole	**DIRECT**	**LOW -**	**LOW -**
	No long term cumulative impacts on marine organisms are expected relative to the ambient light levels in the Coega SEZ.	**CUMULATIVE**	**NO IMPACT**	
	The No-Go option would result in no impacts occurring.	**NO-GO**	**NO IMPACT**	
DIESEL SPILLAGE	Refuelling of vessels (offshore and in port), collisions or other accidents, or operation of the dredger or construction equipment may result in accidental diesel / oil spills, negatively affecting water quality and causing toxic effects potentially resulting in mortality (e.g. suffocation and poisoning) of marine fauna or affecting faunal health.			
	In the case of marine diesel, which evaporates relatively quickly, the impact would only persist over the short-term and would likely remain localised but would be of medium intensity. A precautionary approach is adopted and the worst-case scenario of a heavy fuel oil spill outside of the port boundary is assumed in the assessment.	**DIRECT**	**HIGH -**	**LOW -**
	No long term cumulative impacts on marine organisms are expected relative to the ambient light levels in the Coega SEZ.	**CUMULATIVE**	**NO IMPACT**	

ASSESSMENT OF KEY IMPACTS				
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	The No-Go option would result in no impacts occurring.	**NO-GO**	**NO IMPACT**	
TERRESTRIAL ECOLOGY IMPACTS				
ESTABLISHMENT AND/OR SPREAD OF ALIEN PLANT SPECIES	Failure to rehabilitate and monitor the establishment of Alien Plant Species during the Construction (and Operation) Phase) could lead to the establishment and spread of Alien Plant Species.	**DIRECT**	**MODERATE -**	**LOW -**
	Alien plant species such as *Acacia cyclops* have already established in the project area, particularly within the St Francis Dune Thicket vegetation type. Therefore, should the operation of the proposed development led to the further spread of alien invasive species in the project area, the invasion by alien species could be exacerbated.	**CUMULATIVE**	**MODERATE -**	**N/A**
	Alien invasive plants have already established within the project area. Under the No-go alternative these species are likely to continue multiplying if left unchecked. The current No-go alternative is therefore rated moderate negative.	**NO-GO**	**MODERATE -**	**N/A**
DISTURBANCE AND/OR DEATH OF FAUNAL SCC	Operational activities associated with the proposed development such as vehicular movement are likely to disturb faunal species (e.g., sensitive species 18) using the affected areas. This could result in the movement of faunal species away from the affected areas and/or the loss of faunal species. Slow-moving species such as tortoises and snakes are particularly susceptible to road kills. As such, this impact is rated moderate negative.	**DIRECT**	**MODERATE -**	**LOW -**
	Operational activities associated with the proposed development such as vehicular movement are likely to increase the disturbance of faunal species caused by existing developments and activities within the project area. As such, this impact is rated moderate negative.	**CUMULATIVE**	**MODERATE -**	**N/A**
	Existing developments and activities within the project area will continue to disturb faunal species within the project area, even in the absence of the proposed development. The no-go alternative therefore is rated moderate negative.	**NO-GO**	**MODERATE -**	**N/A**

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
SOCIO-ECONOMIC IMPACTS				
There are a number of positive socio-economic benefits will result as a direct and indirect effect of this activity. The most notable being: ❖ Job Creation; ❖ Growth of the local, regional and provincial economies; and ❖ Contribution to the increase in energy security. ❖ The socio-economic benefits associated with the proposed development will have significant positive long-term positive impacts for the Coega SEZ and the Eastern Cape.				
JOB CREATION	It is estimated that during the operational phase, approximately 200 long-term skilled and unskilled personnel will be required which will in turn create employment opportunities for local labour	**DIRECT**	**MODERATE +**	**MODERATE +**
	Cumulatively the overall CDC Gas to Power project could potentially result in a significant number of employment opportunities over the operational phases of the project.	**CUMULATIVE**	**MODERATE +**	**HIGH +**
	The No-Go option will result in the opportunity cost of job creation for approximately 200 permanent employees	**NO-GO**	**MODERATE -**	**LOW -**
GROWTH OF THE LOCAL, REGIONAL AND PROVINCIAL ECONOMIES	Taxes generated by local procurement will contribute a small but significant portion of national income.	**DIRECT**	**MODERATE +**	**MODERATE +**
	Increased economic activity is desirable, or even critical, in the context of high unemployment and low income levels. Together with all other productive economic activities in the region, energy production at the CDC Gas to Power project benefits the local and national community cumulatively.	**CUMULATIVE**	**MODERATE +**	**HIGH +**
	The No-Go option will result in the opportunity cost of growth of the local, provincial and national economy	**NO-GO**	**MODERATE**	**LOW -**
CONTRIBUTION TO INCREASED ENERGY SECURITY	The main purpose of the proposed CDC Gas-to-Power project is to provide electricity into the national electricity grid whereby contributing to cover the increasing demand of electricity in the country.			
	The energy generated by the project will be fed into the national energy grid and will contribute to energy security both directly, and indirectly by allowing for increased uptake of energy from renewable energy projects.	**DIRECT**	**HIGH +**	**HIGH +**
	The main purpose of the proposed CDC Gas-to-Power project is to provide electricity into the national electricity grid whereby contributing to cover the increasing demand of electricity in the country. The energy generated by the project will be fed into the national energy grid and will contribute to energy security both directly, and indirectly by allowing for increased uptake of energy from renewable energy	**CUMULATIVE**	**HIGH +**	

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
	projects. This could have significant economic benefits for downstream users, in terms of decreased incidence of power outages due to load-shedding.			
	The No-Go option would result in the continuation of the current energy security issues.	**NO-GO**	**HIGH -**	**MODERATE -**
TRAFFIC IMPACT ASSESSMENT				
INCREASED TRAFFIC VOLUMES	Additional vehicle trips generated by the proposed development (up to 323 and 34 additional trips during the AM and PM peak hours for the construction and operational scenarios respectively) will have minimal impact in terms of road capacity given the current low hourly volumes along the road links and at the affected intersections, and low trips generated by the proposed power plant.	**DIRECT**	**LOW -**	**LOW -**
	It is assumed that all proposed plants will be operational by 2030. As such, the TIA has assessed the cumulative operational traffic for the Zone 10 South and North power plants, the Zone 13 power plant and the Liquified Natural Gas terminal and distribution facility added to the latent volumes and the ENGIE Zone 13 plant and the escalated background traffic volumes for the 2030 development horizon.	**CUMULATIVE**	**LOW -**	
	The No-Go option would not result in any impacts	**NO-GO**	**NO IMPACT**	
ADDITIONAL AXLE LOADING RESULTING IN DETERIORATION OF ROAD CONDITION	The Coega IDZ Demand Modelling Report indicates that all Class 2 roads would likely need to accommodate 7.5 million E80s per lane over a 20-year period. Given that the Ring Road is a class 2 road it has likely been designed for these volumes. As such the number of E80s generated by the power plant traffic relative to the maximum expected loading over the 20-year period is minimal.	**DIRECT**	**LOW -**	**LOW -**
	The cumulative impact of all other known power plants will not impact significantly on the road pavements as their design has taken such volumes into account.	**CUMULATIVE**	**NO IMPACT**	
	The No-Go option would not result in any impacts.	**NO-GO**	**NO IMPACT**	

ASSESSMENT OF KEY IMPACTS				
ISSUE	**DESCRIPTION OF IMPACT**	**NATURE OF IMPACT**	**SIGNIFICANCE PRE-MITIGATION**	**SIGNIFICANCE POST-MITIGATION**
TRAFFIC SAFETY IMPACT DUE TO ADDITIONAL / HIGH-SPEED TRAFFIC	Safety issues may initially be a concern given low traffic volumes as traffic is likely to operate at high speeds in low traffic environments.	**DIRECT**	**LOW -**	**LOW -**
	It is assumed that all proposed plants will be operational by 2030. As such, the TIA has assessed the cumulative operational traffic for the Zone 10 South and North power plants, the Zone 13 power plant and the Liquified Natural Gas terminal and distribution facility added to the latent volumes and the ENGIE Zone 13 plant and the escalated background traffic volumes for the 2030 development horizon	**CUMULATIVE**	**LOW -**	
	The No-Go option would not result in any impacts.	**NO-GO**	**NO IMPACT**	

8.4 Summary of Findings and Comparative Assessment of Impacts

This section includes summaries of each field, including the direct/indirect and cumulative impacts. No-go impacts have not been totalled in this section as they relate to the status quo and have been summarised in 8.2.3 and 8.3.3.

8.4.1 General Impacts

All the general negative impacts could be mitigated to either LOW negative or MODERATE negative. Of the 27 impacts, 16 are direct and indirect impacts, while 9 are cumulative impacts. No-go impacts are not represented in this summary and can be found in Section 8.2 and Appendix C.

Table 8-7: General Impact Summary.

	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	5	0	3	0	0	0	0	0	8	0	0	0	0	0	0	0
Operations	4	0	5	0	0	0	0	0	8	0	1	0	0	0	0	0
Decommissioning	2	1	7	0	0	0	0	0	9	1	0	0	0	0	0	0
TOTAL	**10**	**1**	**15**	**0**	**0**	**0**	**0**	**0**	**25**	**1**	**1**	**0**	**0**	**0**	**0**	**0**

8.4.2 Damara Tern Impact

The Damara Tern Impact Assessment rated most of its impacts as HIGH negative pre-mitigation (5 impacts). Of these, one (1) can be mitigated to MODERATE negative post-mitigation significance, while the remaining four (4) remain of a HIGH negative significance (Table 8-8). Both of the two (2) impacts rated as MODERATE negative pre-mitigation can be mitigated to LOW negative significance.

Table 8-8: Damara Tern Impact Summary.

	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0
Operations	0	0	1	0	4	0	0	0	1	0	1	0	3	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**2**	**0**	**5**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**4**	**0**	**0**	**0**

8.4.3 Air Quality Impact

Of the three (3) impacts identified all of the impacts are of a LOW (100%) negative pre-mitigation significance.

Table 8-9: Air Quality Impact Summary.

	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

8.4.4 Climate Change Impact

The direct (Scope 1 & Scope 2) pre-mitigation climate change impacts are both rated as LOW negative significance. The indirect impact of the Scope 3 emissions is however rated as VERY HIGH negative, due to the significant contribution to CO_2 emissions related to potential downstream power plant emissions. The indirect scope 3 impacts cannot be mitigated to LOW negative significance post-mitigation. However it is important to note that although the impact of the Scope 3 GHG contributions is significant, it also includes the benefit of avoided emissions related to coal-fired energy generation emissions.

Table 8-10: Climate Impact Summary.

	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	2	0	0	0	0	0	1	0	2	0	0	0	0	0	1	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

8.4.5 Noise Impact

The direct/indirect noise impacts based on the current layout are all LOW negative significance both pre- and post-mitigation, however the cumulative noise impact (which include the proposed Zone 10 Power Plants) is expected to have a significant (HIGH-) impact on the Damara Tern Colony (NSA10) receptor. It is important to note that the No-Go alternative results in the continuation of current mining activities and the noise disturbances thereof, and is rated as MODERATE negative significance.

Table 8-11: Noise Impact Summary.

	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Operations	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**

8.4.6 Marine Ecology Impact

Two (2) of identified pre-mitigation impacts are rated HIGH negative significance – these are related to cumulative impacts associated with disturbances emanating from current and future Port activities. Both of these impacts can be mitigated to MODERATE negative significance, while four (4) of the impacts rated as MODERATE negative significance for pre-mitigation can be mitigated to LOW negative significance.

Table 8-12: Palaeontology Impact Summary.

	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	5	0	1	0	0	0	0	0	5	0	1	0	0	0	0	0
Operations	8	0	9	0	2	0	0	0	12	0	7	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**13**	**0**	**10**	**0**	**2**	**0**	**0**	**0**	**17**	**0**	**8**	**0**	**0**	**0**	**0**	**0**

8.4.7 Socio-Economic Impact

The social study identified 10 positive impacts and no negative impacts. Of the impacts identified two (2) direct/indirect impacts and two (cumulative) impacts are rated as HIGH positive significance after mitigation. These are related to the increase in energy security and the cumulative impacts of increased energy supply security and investor confidence.

Table 8-13: Social Impact Summary

	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
Operations	0	0	0	6	0	2	0	0	0	0	0	4		4	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1**	**0**	**7**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**5**	**0**	**4**	**0**	**0**

8.4.8 Safety Risk Impact

All pre-mitigation impacts identified in the Quantitative Risk Assessment (QRA) were rated as MODRATE negative significance, consisting of two (2) direct/indirect impacts and two (2) cumulative impacts. One (1) of the direct impacts can be mitigated to LOW negative significance, while the remainder cannot be mitigated further.

Table 8-14: Traffic Impact Summary

	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	4	0	0	0	0	0	1	0	2	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**

8.4.9 Traffic Impact

All impacts identified in the Traffic Impact Assessment were of LOW negative significance, including cumulative and direct/indirect impacts.

Table 8-15: Terrestrial Ecological Impact Summary.

	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0
Operations	5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

8.4.10 Terrestrial Ecological Impact

The Terrestrial Ecological Impact Assessment identified three (3) operational impacts rated as HIGH negative pre-mitigation, this includes both direct and cumulative impacts related to loss of species or habitat. The remaining pre-mitigation impacts are all of LOW - MODERATE negative significance. Of these 22 impacts, seven (7) cannot be mitigated (direct & cumulative impacts related to habitat loss) from MODERATE negative significance while the remainder can be mitigated to LOW negative significance.

Table 8-16: Terrestrial Ecological Impact Summary.

	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	5	0	10	0	3	0	0	0	13	0	5	0	0	0	0	0
Operations	0	0	4	0	0	0	0	0	2	0	2	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**5**	**0**	**14**	**0**	**3**	**0**	**0**	**0**	**15**	**0**	**7**	**0**	**0**	**0**	**0**	**0**

8.4.11 CUMULATIVE IMPACT

Overall, the cumulative impact of the proposed Coega Gas Infrastructure project, when the adjacent proposed Zone 10 Power Plants, and other proposed gas-generated energy developments, including Karpower, are considered is MODERATE negative. Cumulative impacts are notoriously difficult to mitigate since environmental legislation, related to monitoring, construction and operation, changes over time. Developers are therefore not always prescribed the same standards of environmental care. In addition to this, cumulative impacts can only be assessed using available data and in some cases older EIAs did not assess impacts to the same level of detail, e.g. specialist studies can vary drastically, which means that data is often limited.

In terms of HIGH negative cumulative impacts, the key impact relates to disturbance of key SCC receptors (Damara Tern Colony) and overall contributions to climate change through GHG emissions. In terms of climate change impacts it could be argued that the implementation of gas-fired power plants would cumulatively, decrease the overall national CO2 emissions should similar capacity coal and/or diesel power plants be phased out as a result of the development of the gas-to-power energy facilities.

Conversely, the positive cumulative socio-economic impacts are largely rated as HIGH positive significance after mitigation. This is mainly due to the contribution to increased energy security and potential increases in investment in the Coega SEZ and the economic growth resulting therefrom.

It is concluded that majority of the cumulative impacts are MODERATE or LOW negative significance. A negative HIGH significance impact is expected for Noise Impacts to nearby sensitive receptors (specifically the Damara Tern Colony). This rating is based on the supporting proposed Coega Zone 10 North and Zone 10 South Gas-Fired Power Plants which are the main expected sources of noise rated for the cumulative impact. Additionally, cumulative impacts with HIGH positive impacts are expected as a result of the potential increases in job opportunities, economic growth, energy security and the resultant investor confidence.

8.4.12 NO-GO ALTERNATIVE

There are a number of current environmental impacts which are taking place on the proposed site. The main existing impacts include existing maritime traffic within the Port, existing pollution and habitat degradation, existing mining operations within Zone 10, existing invasive alien infestations (notably NEMBA category 1a species *Acacia cyclops*) and existing noise and faunal disturbances generated by the existing tenants.

The no-go alternatives of the remainder of the impacts mean that the site and its surrounding remain as is (status quo). This means that the negative impacts described in this report would not transpire and nor would the positive impacts.

9 PUBLIC PARTICIPATION

9.1 NOTIFICATION OF INTERESTED AND AFFECTED PARTIES

Public consultation is a legal requirement throughout the EIA process. Developers are required to conduct public consultation throughout the Scoping and EIR phase. Formal EIA documents are required to be made available for public review and comment by the proponent, these include the Project Brief, Scoping Report and Terms of Reference for the EIA, the draft and final EIA reports and the decision of the Competent Authority (DFFE). The method of public consultation to be used depends largely on the location of the development and the level of education of those being impacted on by the project. Required means of public consultation include:

- Site notice(s);
- Newspaper advertisement(s);
- Letter of Notification and information to affected landowner(s), stakeholders and registered I&APs (Proof: e-mail, fax, registered letters to DFFE);
- Background Information Document (BID) distribution;
- Public meeting (Attendance register and meeting minutes); and
- Authority and Stakeholder engagement (DFFE, DWS, SAHRA, DEDEAT, etc.).

Please note that all proof of Public notification has been attached as APPENDIX A.

9.1.1 NEMA EIA REGULATION 21(2)(A) NOTIFICATION

NEMA EIA Regulations 2014 (GNR 326) Section 21 (2)(b) stipulates that "Subject to regulation 46, and if the findings of the scoping report is still valid and the environmental context has not changed, the submission of a scoping report as contemplated in subregulation (1) need not be complied with (b) on condition that regulation 16 is complied with and that such application is accompanied by proof that registered interested and affected parties, who participated in the process conducted as part of the previous application, have been notified of this intended resubmission of the application prior to submission of such application.

All registered I&APs & stakeholders from the previous application were duly notified of the intent to resubmit an application for environmental authorisation on 12 December 2022. Proof of notification if provided in Section 12.4 under APPENDIX A

9.1.2 NEWSPAPER ADVERTISEMENT

The public will be notified via a local newspaper advertisement (The Herald). The advert will be published at the onset of the public review period.

The newspaper advertisement has been placed in The Herald on the INCLUDE DATE*: See APPENDIX A

9.1.3 ONSITE NOTICES

The location for the proposed CDC Gas to Power Infrastructure development has restricted access and thus site notice boards will not be accessible by the general public. Site notices will therefore be placed on the electronic notice board in the CDC Office Foyer, which is accessible by the public.

Electronic Signages have been displayed in the CDC Foyer: See APPENDIX A.

9.1.4 Interested and Affected Parties (I&APs) identification and notification

In addition to the above notification, certain I&APs were identified based on their potential interest in the project. In Table 9-1, relevant organisations were contacted either via e-mail or directly for comment and were sent a Letter of Notification and a Background Information Document (BID). In addition, surrounding landowners and additional I&APs were identified and notified, the details of which can be found in APPENDIX A.

Table 9-1: Stakeholder and Organisational Database

Stakeholder:	Name:
CDC	Duane Mouton
CDC	Khuthala Somdaka
CDC	Viwe Biyana
CDC	Andrea von Holdt
CDC	Amanda Mbokodi
CDC	Lesedi Sipuka
CDC Applicant Representative	Telly Chauke
CDC Gas PM	Duane Mouton
CDC ELC Member Unit Head: Spatial Developer	Firhana Same
CDC Acting Unit Head: Sustainability Unit	Simphiwe Silwana
Africoast	Thomas Jachens
Bird Life SA	Mark Anderson
BirdLife South Africa	Dr Hanneline Smit-Robinson
BirdLife South Africa	Mr Daniel Marnewick
BirdLife South Africa: Birds and Renewable Energy Manager	Ms Samantha Ralson
BirdLife South Africa: Policy & Advocacy Manager	Mr Simon Gear
CDC ELC Member	Graham Taylor
Cell C	Mr Dirk Van Der Walt
Cell C	Mr Hugo Dippenaar
Cell C	Mr Rudi Liebenberg
Cell C	Mr Wiaan Vermaak
DEDEAT	Andries Struwig
DEDEAT	Dayalan Govender
DEDEAT: Provincial Air Quality Officer	Lyndon Mardon
DEDEAT Sarah Baartman District	Dante Rademeyer
DEDEAT Sarah Baartman District	Leon Els
DEDEAT Sarah Baartman District	Mlungiseleli Kosi
DEDEAT: Coastal Zone Management	Leight-Anne Kretzman
DEDEAT: Coastal Zone Management	Loyiso Nondlebe
DEDEAT: Coastal Zone Management	Ricky Hannan
DEDEAT: Coastal Zone Management (Cacadu Region)	Sibulele Nondoda
Department of Agrarian Reform and Rural Development	Bahlekile Keikelame
Department of Agrarian Reform and Rural Development	Ms Thabile Mehlomakhulu
Department of Agrarian Reform and Rural Development	Ms Xoliswa Nyathi
DEDEAT	Mr Alistair McMaster
DEDEAT	Mr Siyabonga Gqalangile
Department of Energy	Ms Mokgadi Mathekgana

DEDEAT: Biodiversity & Conservation	Mr Shonisani Munzhedzi
DEDEAT: Biodiversity & Conservation	Mr Simon Malete
Department of Mineral Resources (DMR) (Eastern Cape)	Ms Brenda Ngebulana
Department of Mineral Resources (DMR) (Eastern Cape)	Ms Zimkita Tyala
Department of Transport	Danie Pretorius
Department of Water & Sanitation (DWS) (Eastern Cape)	Mr Thabo Nokoyo
Department of Water & Sanitation (DWS) (Eastern Cape)	Ms Marisa Bloem
Department of Forestry, Fisheries and the Environment (DFFE): Oceans and Coast	Nontsasa Tonjeni
DFFE: Ocean & Coast	Yazeed Peterson
DFFE	Avhantodi Munyai
DFFE	Babalwa Layini
DFFE	Coenrad Agenbach
DFFE	Jongikhaya Witi
DFFE	Lerato Moja
DFFE	Mactavish Makwarela
DFFE	Mapula Tshangela
DFFE	Masina Morudu (Litsoane)
DFFE	Milicent Solomons
DFFE	Mmamohale Kabasa
DFFE	Mashudu Marubini
DFFE	Thoko Buthelezi
DFFE	Zamalanga Langa
DFFE	Muhammad Essop
DFFE	Olebogeng Matshediso
DFFE	Phumeza Skepe
DFFE	Sibonele Mbanjwa
DFFE	Stanley Tshitwamulomoni
DFFE	Thuli Mdluli
DFFE	Trisha Rene Pillay
DFFE	Vumile Senene
DFFE: Deputy Director: Strategic Infrastructure Development	Wayne Hector
DFFE Biodiversity Conservation Unit (BCU)	Portia Makitla
DFFE Biodiversity Conservation Unit (BCU)	Thobekile Zungu
DFFE Directorate: Sustainable Aquaculture Management	Fatima Daya
DFFE Directorate: Sustainable Aquaculture Management	Kishan Sankar
DFFE Directorate: Sustainable Aquaculture Management	Maxhoba Jezile
DFFE Directorate: Sustainable Aquaculture Management Environmental Officer: Shellfish Production	Michelle Pretorius
DFFE: Biodiversity Mainstreaming EIA	Biodiversity Conservation
DFFE: Biodiversity Mainstreaming EIA	Mmatla Rabothata
DFFE: Biodiversity Mainstreaming EIA	Tsholofelo Shalot Sekonko
DFFE: Directorate: Biodiversity Conservation	Seoka Lekota
DFFE: Oceans & Coast Eastern Cape	Pontsho Makonko
DFFE:Oceans & Coast	Monde Mayekiso
DFFE:Oceans & Coast	Mulalo Tshikotshi

DFFE:Oceans & Coast	Nitasha Baijnath-Pillay
DFFE:Oceans & Coast	Reuben Molale
DMR	Azwihangwisi Mulaudzi
DMR	Deidre Watkins
DMR	McDonald Mdhuli
DMR	Vusi Kubheka
DPW	Monde Manga
DWS	Lizna Fourie (Licensing)
DWS	Ncumisa Mnotoza Heymann
DWS	Thandi Mmachaka
DWS: Groundwater	Babalwa Ndlangisa
DWS: WQM	A Dukashe
DWS: WQM	Bera Moosa
DWS: WQM	Kunene Bhekokwakhe
DWS: WQM	Magwentshu Lawona
DWS: WQM	Moodley Dheegan
DWS: WQM	Z Magodla
DWS: WUA	Esmeralda van Rooyen
Dynamic food	Natasha
East London Museum	Philip Whittington
Eastern Cape Development Corporation (ECDC)	Mr Rory Haschick
Eastern Cape Parks and Tourism Agency	Ayaka Peter
Eastern Cape Parks and Tourism Agency	Dean Peinke
Eastern Cape Parks and Tourism Agency	Kagiso Mangwale
Eastern Cape Parks and Tourism Agency	Mzwabantu Kostauli
Eastern Cape Parks and Tourism Agency	Nomatile Nombewu
Eastern Cape Provincial Heritage Resources Authority (ECPHRA)	Mr Lennox Zote
Eastern Cape Provincial Heritage Resources Authority (ECPHRA)	Mr Sello Mokhanya
EC DEDEAT	Mickey Mama
EC Dept of Labour	Adele Bezuidenhout
ECDoT	Randall Moore
ECPHRA (EC Heritage)	Mzikayise L Zote
Ecxcelerate Energy	Gonzalo Ramirez
Endangered Wildlife Trust: African Crane Conservation Programme Manager	Ms Kerryn Morrison
Endangered Wildlife Trust: CEO	Ms Yolan Friedman
Endangered Wildlife Trust: Head of Conservation Science	Dr Harriet Davies-Mostert
Endangered Wildlife Trust: Wildlife & Energy Programme	Mr Lourens Leeuwner
ENGIE Southern Africa	Tebogo More
Eskom	Chuma Mtati
Eskom	Mr Eddie Leach
Eskom Transmission division and Renewable Energy	John Geeringh
Eskom: Eastern Cape Operating Unit	Xolani Wana
G7 Renewable Energies (Pty) Ltd	Veronique Fyfe
Glendore Sand & Stone	Gavin Eales
Habitat Link Consulting	Christelle du Plessis
L2B	Estelle Pillay
L2B	Sherina Shawe
Monetgas	Tim Foxen
MTN	Mr Krishna Chetty

Mulilo Renewable Project Developments	Ryan David-Anderson
Nelson Mandela Bay Municipality	Andre Van der Westhuizen
Nelson Mandela Bay Municipality	Annette Theresa Lovemore
Nelson Mandela Bay Municipality	Lance Grootboom
Nelson Mandela Bay Municipality	Lawrence Troon (Good)
Nelson Mandela Bay Municipality	Luxolo Namette
Nelson Mandela Bay Municipality	Mkhuseli Jack
Nelson Mandela Bay Municipality	Mokgethi Kabelo Mogatosi
Nelson Mandela Bay Municipality	Retief Odendaal
Nelson Mandela Bay Municipality	Tukela Zumani
Nelson Mandela Bay Tourism	Tourism Office
NMB Rate Payers Association	Khaled El-Jabi
NMBM	Rosa Blaauw
NMBM	Shane Brown
NMBM: Manager Environmental Health	Buyiswa Deliwe
NMBM: Electricity & Energy	Peter Neilson
NMBM: Environmental Management	Jill Miller
NMBM: Environmental Health	Patrick Nodwele
NMBM: Public Health Directorate	Sizwe Mvunelwa
NMBM: Water & Sanitation	Barry Martin
PPC	Hugo Badenhorst
PPC	Karlwim Heese
PPC: Group Company Secretary	Kristell Holtzhausen
Roads (SANRAL/Public Works)	Ms Nenekazi Songxaba
Rural Development & Agrarian Reform	Ms N Bongco
Rural Development & Agrarian Reform	Thembani Nyokana
Rural Development and Agrarian Reform	Siphokazi Ndudane
Rural Development and Agrarian Reform	Vuyokazi Qamba
SAHRA	Ayanda Mncwabe-Mama
SAHRA	Briege Williams
SAHRA	Lesa La Grange
SAHRA	Lungisa Malgas
SAHRA	Ruan Brand
SAMSA	Bongi Stofile
Sanparks	Ane Oosthuizen
Sanparks	Rob Milne
SANRAL	Chumisa Njingana
Sarah Baartman District EC Tourism	Duma Magxwalisu
Sentech	Ms Alishea Viljoen
South African Environment Observation Network (SAEON)	Angelique Brooksbank
South African Heritage Resource Agency (SAHRA)	Briege Williams
Sundays River Valley Tourism Forum	Yvonne van Tol
Telkom	Mr Raymond Couch
Telkom SA	AJ Rautenbach
Transnet General Manager: Corporate Communications	Mboniso Sigonyela
TNPA: SHE Manager	Zimasa Sani
TNPA	Mandilakhe Mdodana
TNPA	Mpatisi Pantsi
TNPA	Renee De Klerk
TNPA	Thulani Dubeko
Total Energies	Bertus van Niekerk
Transnet	Annedene Bantom

Vodacom	Mr Andre Barnard
Ward 53	Nomazulu Mthi
Ward 53	Zwelandile Patrick Tsotso
Ward 60	Thembinkosi Bethwell Mafana
WESSA	Mike Denison
WESSA	Morgan Griffiths
WESSA EC Regional Representatives	Ms Eileen Shepherd
Zwartkops Conservancy	Jenny Rump
CEN Integrated Environmental Management Unit	Mike Cohen
Nelson Mandela Bay Sand and Stone (Pty) Ltd	Barnard Coenrad

9.1.5 Surrounding and Affected Landowners

All tenants and surrounding and affected landowners have been included in the notification of intent to submit an application and will be notified throughout the EIA process.

9.1.6 Registered I&APs

All registered stakeholders and Interested and/or Affected Parties (I&APs) will form part of the stakeholder and I&AP database for this Environmental Impact Assessment Process in the I&AP Database (Appendix A). Furthermore, all registered I&APs for the Scoping Phase (that was previously conducted) have automatically been reregistered as I&APs for the current EIA phase, and have already been notified of intent to submit an application. They will also be notified throughout the EIA process.

Any additional stakeholders and/or I&APs, that register during the 30 day public review period, will also be added to the database. The Draft Environmental Impact Assessment Report (and associated documents) will be made available on the CES website (www.cesnet.co.za/public-documents). A copy of the Draft Environmental Impact Assessment Report will also be made available at the CDC Office Foyer.

9.1.7 The Public Participation Process followed and to be followed includes:

- All registered stakeholders, I&APs and surrounding/affected landowners and tenants were notified of intent to submit an Environmental Application. All previous I&APs and stakeholders from the Scoping Phase were reregistered for the EIA Phase;

- All registered stakeholders and I&APs will form part of the stakeholder and I&AP database for this Environmental Impact Assessment Process. Any additional stakeholders and/or I&APs, that register during the public review period, will also be added to the database;

- The location for the proposed CDC Gas to Power Infrastructure development has restricted access and thus site notice boards will not be accessible by the general public. Site notices will therefore be placed on the electronic notice board in the CDC Office Foyer, which is accessible by the public;

- All registered stakeholders and I&APs will be notified of the availability of the Draft Environmental Impact Assessment Report and associated reports for public review via email and sms (where applicable) notification. The public will be notified via a local newspaper advertisement (The Herald). The advert will be published at the onset of the public review period;

- Release of the Draft Environmental Impact Assessment Report for Authority, Stakeholder, I&AP and Public review: The Draft Environmental Impact Assessment Report and associated specialist reports will be made available for a thirty (30) day public review period. The Draft Environmental Impact Assessment Report (and associated documents) will be made available on the CES website

(www.cesnet.co.za/public-documents). A copy of the Draft Environmental Impact Assessment Report will also be made available at the CDC Office Foyer; and

- No public meetings are planned for the release of the Draft Environmental Impact Assessment Report for public review. However, all comments received via telephone and sms will be included in the Issues and Report Trail (IRT) to accommodate those that do not have access to the internet, those that are illiterate and those with disabilities. In addition, a brief project background can be provided verbally during telephone discussions, where necessary.

9.2 ISSUES & RESPONSE TRAIL

An Issues & Response Trail (IRT) can be found in Appendix H of this document as a separate standalone chapter. The IRT includes all issues raised includes the EAP responses to these issues. These tables will be updated throughout the process from inception until submission of the Final EIR to the Competent Authority (DFFE).

10 CONCLUSION AND RECOMMENDATIONS

10.1 DESCRIPTION OF THE PROPOSED ACTIVITY

The proposed Gas Infrastructure will consist of all key supporting infrastructure required for the operation of the CDC's proposed Gas to Power plants in the Coega SEZ. This will be made up specifically of infrastructure for the import, storage and transmission of LNG via the Port of Ngqura, to the various power plants, and seawater for cooling to and from the Zone 10 power plants (should they be seawater cooled), and heating water to the onshore storage and regasification unit. Additional capacity of supply of LNG and natural gas (NG) to third party offtakers, potentially including the Dedisa peaking power plant, should this be converted to gas, will also be included. The key infrastructure includes the following:

- Up to two floating storage and regasification units (FSRUs), moored in the Port, which will receive, store and regasify the LNG from the LNG carrier. It is proposed that onshore storage and regasification facilities will replace the FSRUs once the demand for NG reaches a point where onshore storage and regasification is the more feasible option, at which point the FSRUs will be removed
- A new jetty with offloading platform and berthing facilities in the Port of Ngqura
- A trestle structure to support the gas and cryogenic pipelines running within the port from the offloading platform parallel to the eastern breakwater, to the point where the pipelines will cross under the breakwater near the admin craft basin, thereafter running underground
- A LNG and gas hub, consisting of storage and regasification facilities (for development once the FSRU is no longer the most feasible option), and a truck delivery centre for third party offtakers. Gas metering, admin, control rooms, workshops, and vents will be included in the LNG and gas hub
- Gas pipelines (for transmission of NG) from the FSRU and jetty to the three proposed power plants, the LNG and gas hub (for third party offtakers) as well as the boundary of the Dedisa power plant in Zone 13
- Cryogenic pipelines (for transmission of LNG) from the berthing facilities in the port to the storage and regasification unit at the LNG and gas hub (once this has replaced offshore storage and regasification at the FSRU)
- Pipelines for the transmission of seawater for cooling from the abstraction point in the port, to the Zone 10 power plants (if seawater cooled), and for heating to the regasification plant at the LNG and gas hub in Zone 10

10.2 NEED AND DESIRABILITY

Increasing pressure is being placed on countries internationally to reduce their reliance on fossil fuels, such as oil and coal, which contribute towards Greenhouse Gases (GHG) being emitted into the atmosphere and thus climate change. Renewable energy resources such as wind energy facilities and solar PV farms are being implemented as alternative sources of energy at a global and national scale.

South African Integrated Resource Plan (IRP 2019) was finalised in 2019, setting out a new direction in energy sector planning. The plan included a shift away from coal, increased adoption of renewables and gas, and an end to the expansion of nuclear power. The revised plan marks a major shift in energy policy. The draft policy aimed to decommission a total of 35 GW (of 42 GW currently operating) of coal generation capacity from Eskom by 2050, starting with 12 GW by 2030, 16 GW by 2040 and a further 7 GW by 2050.

The proposed Gas to Power infrastructure will create employment opportunities during the construction and operation phases and provide the necessary infrastructure for the provision power to the national energy grid during the operation phase, improving energy security at a national level and indirectly facilitating further development opportunities in the area. The project would therefore constitute a strategic investment that will generate benefits through the provision of power, in a more environmentally sustainable manner than coal fired power generation. The project will also potentially allow for increased power supply from renewable energy sources over the longer term, thereby mitigating intermittency of supply to facilitate a more assured, dispatchable power supply.

In essence, the gas infrastructure is needed to address current and projected energy shortfall at a national level, as well as stimulate local employment and the economy.

Gas fired power generation is among the current alternative sources of energy which has been shown to be an efficient and, in comparison with coal fired power plants, a relatively clean method of thermal power generation.

10.3 Assumptions, Limitations and Gaps in Knowledge

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit–

- This report is based on a project description and site plan, provided to CES by the applicant, which has not been approved by DFFE at this stage of the project. The project description and site plan may undergo iterations and refinements before being regarded as final. A project description based on the final design will be concluded once DFFE has provided feedback on the layout provided in this report
- Descriptions of the natural and social environments are based on limited fieldwork and available literature
- It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the accompanying maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken

The following assumptions were made during the EIA process and the EIR assumes that:

- Due to the cost of preparing detailed designs and plans, such detailed design/ planning information would only be developed in the event of EA being granted. As such, it is anticipated that, as is typically the case in an EIA process, the EIA will assess broad land uses and concept designs
- The project, as described in this report, is viable from an engineering design perspective, as well as economically, and that the project has been correctly scoped to align with other infrastructure that is outside the scope of this EIA such as the CDC Marine Pipeline Servitude EIA
- a worst case scenario approach is adopted in assessing the various aspects of the project so that the impacts assessed will cover whatever option is put forward by the chosen bidder
- where overlaps in location occur, all mining operations with existing mineral rights will have ceased prior to commencement of construction activities for the CDC's Gas to Power project

In addition, the following aspects are excluded from the scope of work:

- Sources of gas – we assume LNG would be imported from suitably authorised sources
- An evaluation of different energy sources as part of the energy generation mix, apart from interim use of liquid fuel. It is assumed, based on the IRP, that this has been decided at a strategic level, and it is assumed this included an assessment of environmental factors. Apart from describing the motivation (or

need) for gas generated power as part of the energy mix, this assessment will not consider relative merits of different energy sources

- The transmission of electricity from the power plants to the Grassridge and/or Dedisa substations – it is understood that the bulk powerlines required for this are already authorised (DEA Ref: 12/12/20/781) and therefore will not be assessed as part of this EIA
- Activities (or the equivalent listed activities at the time) previously authorised via separate EIA processes for the whole SEZ, including the clearing of vegetation, rezoning of land, and installation of bulk services infrastructure. Relevant listed activities are listed in Table 2-1 with reasons as to why they are not being applied for
- The evacuation of power from Grassridge and/or Dedisa substations to consumers.

10.4 Environmental Cost-Benefit Analysis

114 impacts were identified during the EIA process. Of the identified impacts 103 are NEGATIVE pre-mitigation and 11 are POSITIVE pre-mitigation. Approximately 67% of the negative impacts are LOW, 17% are MODERATE, 4% are HIGH, and less than 1% are VERY HIGH post-mitigation significance. Most of the positive impacts are of a HIGH-MODERATE post-mitigation significance.

Table 10-1 :Cost-benefit Analysis

DESIGN PHASE	PRE-MITIGATION								POST-MITIGATION							
	LOW		MODERATE		HIGH		VERY HIGH		LOW		MODERATE		HIGH		VERY HIGH	
MINOR AND GENERAL IMPACTS																
Positive/Negative	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
Construction	5	0	3	0	0	0	0	0	8	0	0	0	0	0	0	0
Operations	4	0	5	0	0	0	0	0	8	0	1	0	0	0	0	0
Decommissioning	2	1	7	0	0	0	0	0	9	1	0	0	0	0	0	0
DAMARA TERN IMPACTS																
Construction	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0
Operations	0	0	1	0	4	0	0	0	1	0	1	0	3	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AIR QUALITY IMPACTS																
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLIMATE CHANGE IMPACTS																
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	2	0	0	0	0	0	1	0	2	0	0	0	0	0	1	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MARINE ECOLOGICAL IMPACTS																
Construction	5	0	1	0	0	0	0	0	5	0	1	0	0	0	0	0
Operations	8	0	9	0	2	0	0	0	12	0	7	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NOISE IMPACTS																
Construction	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Operations	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAFETY RISK IMPACTS																
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	4	0	0	0	0	0	1	0	3	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOCIO-ECONOMIC IMPACTS																
Construction	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
Operations	0	0	0	6	0	2	0	0	0	0	0	4		4	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFFIC IMPACTS																
Construction	5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0
Operations	5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TERRESTRIAL ECOLOGICAL IMPACTS																
Construction	5	0	10	0	3	0	0	0	13	0	5	0	0	0	0	0
Operations	0	0	4	0	0	0	0	0	2	0	2	0	0	0	0	0
Decommissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**46**	**2**	**45**	**7**	**11**	**2**	**1**	**0**	**77**	**2**	**20**	**5**	**5**	**4**	**1**	**0**

10.5 Fatal Flaws

It is the opinion of the EAP that based on the information gathered during the course of the EIA process, including specialist studies and PPP, the impacts described do not represent any fatal flaws regarding the proposed Coega Gas Infrastructure.

10.6 EAP's Opinion of Key Impacts

The project will result in unavoidable adverse environmental impacts, some of which cannot be effectively mitigated. Assuming that the recommended mitigation measures will be effectively implemented, most of the adverse impacts predicted to result from the project will be of an acceptable significance. The notable exceptions to this are the impact to the *Abalone Farm* Damara Tern colony and the climate change impacts, resulting from greenhouse gas emissions from operation of the gas infrastructure (more, specifically the cumulative upstream and downstream sources), which are predicted to result in a HIGH - negative impact.

Section 10.6.1 and 10.6.2 below, discuss the anticipated impacts, proposed mitigation and overall opinions of these key HIGH negative significance impacts.

10.6.1 Impacts to Abalone Farm Damara Tern Colony

Its noted that the site alternative for Phase 2 of the proposed development, namely the construction and operation of the LNG and Gas Hub, is located approximately 200 m from the *Abalone Farm Damara Tern* colony and the authors of the specialist Damara Tern Impact Assessment Report are of the opinion that the development of Phase 2 of the Gas Infrastructure Project which includes two LNG Storage tanks and a regasification facility at the Gas Hub will result in adverse impacts to this critically endangered colony. This is largely attributed to the visual presence of the proposed site location for the LNG and Gas Hub. It is concluded that this is likely to result in a decrease in the number of breeding pairs, a decrease in breeding success and ultimately extinction of this Damara Tern colony.

However, the No-Go Alternative for the Integrated Coega Gas to Power projects is not guaranteed to ensure the sustainability of the *Abalone Farm Damara Tern* colony. The impact of past and future sand mining was assessed to be of Moderate negative significance (50% of the dunefield has already been mined) and the EIA for the Marine Intake and Outfall Infrastructure assessed the construction phase impacts on the Damara Tern colony to be High even after mitigation (CES 2021).

Additionally, the report indicates that the impact of dunefield sand starvation on the Damara Tern colony due to mining was assessed to be High reducing to Medium after mitigation (Martin 2019). And the marine intake and outfall servitude downwind of the Damara Tern colony will further reduce sand entering the dunefield by obstructing the coastal and hummock dune sand transport corridor and the EIA for the marine servitude project assessed impacts on the dune system to be High reducing to Moderate after mitigation (CES 2021).

It is also noted that should the Damara Terns cease to breed at the *Abalone Farm* colony, the breeding pairs would likely move to other colonies in Algoa Bay – the *Schelm Hoek* colony being the closest large colony.

Offset mitigation that involves formal protection of the *Schelm Hoek* dunefield, ideally by incorporation into Addo Elephant National Park, if feasible, is an important consideration if the proposed developments in Zone 10 of the Coega SEZ are approved.

There are however, mitigation measures proposed for the foreseen extinction of the *Abalone Farm* colony included in the Damara Tern Impact report, namely:

- Avoidance Mitigation: relocating the proposed site location for the LNG and Gas Hub to outside of a 1 km radius of the Damara Tern colony.
- Offset Mitigation: Secure formal protection for the Damara Tern colony at the nearby *Schelm Hoek Dunefield* colony.

Considering the anticipated impacts of the No-Go alternative and the resultant uncertainty of the sustainability of the *Abalone Farm* colony, as well as the current and future impacts to the dunefield sand resources, it is of the EAP's opinion that although mitigation hierarchy dictates that avoidance mitigation should be the first step in impact mitigation, which would include the relocation of the proposed LNG and Gas Hub site outside of a 1km radius of the Abalone Farm colony, the existing and future anticipated impacts for the No-Go scenario cannot guarantee the sustainability of the Abalone Farm colony and therefore, offset mitigation, as proposed, may result in more certain, long-term sustainability of the cumulative Algoa Bay Damara Tern population.

10.6.2 CLIMATE CHANGE AND SOCIO-ECONOMICS

Climate change impacts, resulting from greenhouse gas emissions from operation of the gas infrastructure (and more specifically, the upstream and downstream sources), are predicted to result in a Very High negative impact. While downstream emission levels will differ depending on the power generation technology used, the impact will remain Very High and this impact is unavoidable for a project of this nature.

It is pertinent when assessing the negative impacts of the GHG contributions that the Department contrasts this negative impact with the positive climate change and socio-economic impacts anticipated from the proposed development.

Gas distribution infrastructure can act as an enabler for a wider use of natural gas within South Africa's economy, especially for power generation. Natural gas is significantly less emission intensive than coal, which will reduce the emission intensity of the national grid, and other combustion related activities, such as for heaters, boilers, furnaces, and similar processes. Compared to coal, the emissions from natural gas also contain significantly less harmful products and a negligible amount of ash.

Other potential benefits of the use of natural gas for power generation (which could contribute towards offsetting greenhouse gas emissions generated) include the greater flexibility of this type of power plant relative to coal, allowing for increased uptake of renewable energy to the grid, and over time a shift in the South African power generation mix to greater reliance on renewables, with the associated advantages in terms of reduced greenhouse gas emissions.

In addition, the project will be of ongoing regional socio-economic benefit of the Coega SEZ and the Nelson Mandela Bay Metro Municipality, as well as nationally in terms of security of energy supply.

The main purpose of the proposed CDC Gas-to-Power project is to provide electricity into the national electricity grid whereby contributing to cover the increasing demand of electricity in the country. This could have significant economic benefits for downstream users, in terms of decreased incidence of power outages due to load-shedding and increased investor confidence as a result. From a socio-economic perspective the

proposed Gas Infrastructure, and overall Coega Gas to Power Project, is likely to lead to increased employment and improvement in livelihoods, enhancement of skills and knowledge; and general improvement of the local and regional economies.

The proposed Gas Infrastructure project will help to secure approximately 2,000 direct employment opportunities in the short term and 200 in the long term, and, cumulatively the overall CDC Gas to Power project could potentially result in a significant number of employment opportunities over the construction and operational phases of the project as well as additional future opportunities borne out of potential future development opportunities, and investor interest, made available because of the Gas-to-Power infrastructure within the Coega SEZ, and wider NMBM area.

10.7 Opinion of the EAP

The ecological, climate-change and socio-economic trade-offs must be factored in by the department during the decision-making process. It is the opinion of the EAP that site is sensitive from a visual perspective (Damara Tern colony), sensitive from a climate change perspective (Very High negative impacts anticipated as a result of GHG emissions), and suitable from a socio-economic perspective (increased energy security, increased economic growth, job opportunities, etc.).

The fundamental decision is whether to allow the development and the operation of the Gas Infrastructure, which is consistent with development policies for the area and will likely have key significant positive socio-economic impacts, but which may also have significant climate change impacts in terms of greenhouse gas emissions, and may likely contribute to the localised extinction of the *Abalone Farm* Damara tern colony.

Based on the contents of this report, and all associated documentation, it is the opinion of the EAP that the proposed Coega Gas Infrastructure (Phase 1), which comprises the Port of Ngqura infrastructure, gas pipelines and road loading facility in the north-west portion of the Gas Hub, should be authorised on condition that all conditions stipulated in Section 10.8 of this report be contained within the EA.

Additionally, it is of the EAPs opinion that the proposed Coega Gas Infrastructure (Phase 2), namely the LNG storage tanks and regasification unit at the onshore LNG and Gas Hub, be authorised on condition that all conditions stipulated in Section 10.8 of this report be contained within the EA, and on condition that either:

- the LNG and Gas Hub site location is repositioned outside of a 1 km radius of the *Abalone Farm* Damara Tern colony; or
- CDC, as the developer, ensures implementation of formal protection of the *Schelm Hoek* dunefield.

10.8 Recommendations of the EAP

10.8.1 Construction Recommendations

The following mitigation measures must be implemented during the construction phase:

- Disturbance to the natural vegetation to be kept to the minimum.
- Dust control measures such as wetting and covering of stockpiles to be implemented when necessary.
- A waste management plan should be in place and should address classification of waste streams, segregation at source, control of waste on site before disposal, removal of wastes from site, and record keeping.
- The Contractor must identify and separate materials that can be reused or recycled to minimise waste, e.g. metals, packaging and plastics, and provide separate marked bins/ skips for these items. These wastes must then be sent for recycling and records kept of recycling.
- No disposal of wastes, other than at registered landfill sites.

- No waste may be burned.
- Sufficient portable on-site weather & vermin proof bins with lids need to be provided and appropriately placed and emptied regularly (contents to be disposed of at a licenced landfill site, and proof of disposal retained for auditing purposes).
- Ensure that construction materials (e.g. bags of cement) are suitably stored and protected to avoid wastage.
- Excess excavated material that cannot be used for backfill should not be allowed to accumulate on site and should be disposed of at a formal landfill site or suitable spoil site identified in conjunction with the ECO.
- Use existing access tracks where possible.
- Handling of hazardous liquids over impermeable surfaces only to prevent leaks or spills.
- An erosion control plan must be compiled by a suitably experienced specialist, outlining specific recommendations for stabilisation of dunes that are cleared or disturbed during construction. This must be compiled in conjunction with a revegetation plan by a suitably experienced specialist in coastal vegetation.
- A revegetation plan must be compiled by a suitably experienced specialist in coastal vegetation, outlining specific recommendations for rehabilitation of coastal vegetation that is cleared or disturbed during construction.
- No-Go/ open space areas must be clearly demarcated/ clearly marked (i.e. with danger tape) before any construction activities commence on site and appropriate measures implemented to ensure compliance.
- Clearing must take place in a phased manner (i.e. the entire area to be developed should not be cleared all at once) to allow any fauna to migrate to adjacent areas safely.
- Vehicles and/ or plant and personnel shall only be permitted within the demarcated construction areas, or on existing roads and/ or access tracks between demarcated areas.
- No clearing of vegetation, abstraction, storage, disposal or mixing of any substance (e.g. water, cement, petroleum etc.) may take place outside the demarcated construction area without prior approval of the ECO.
- No fires permitted on site.
- Limit all activities to within the construction footprint area, which must be demarcated prior to commencement of clearing.
- No hunting, poaching or otherwise harming of wildlife on and around the site.
- Site walkthrough and search and rescue to be conducted by a suitably experienced faunal specialist prior to clearing of the site, with particular focus on faunal species of special concern that may occur in the vicinity.
- Clear vegetation in a phased manner in order to allow any fauna to migrate to adjacent areas safely.
- No wildlife may be removed from the site or surrounding areas unless approved by the ECO in conjunction with the appropriate permits obtainable from relevant competent authorities.
- Educate workers on site about the protection of all fauna on site.
- An alien invasive vegetation monitoring and control programme must be implemented throughout the construction and defects notification period, to clear alien invasive vegetation from all areas affected by construction activities and prevent its regrowth.
- The following management plans must be compiled prior to construction, implemented, and made available to the authorities on request:
    - Alien invasive plant management plan
    - Plant rescue and protection plan
    - Revegetation, maintenance and habitat rehabilitation plan
    - Erosion management plan
- An archaeologist must be present on site during vegetation clearing of selected strips of vegetation (to be identified by the archaeologist). Clearing must be by small machinery, or the least invasive method of clearing.

- Monitoring by an archaeologist must take place during all earthmoving activities, including, but not limited, to trenching and piling.
- If any concentrations of heritage material / fossils are exposed during construction, all work in that area must cease and it must be reported immediately to the Albany Museum so that the required investigations can be undertaken. This could entail Phase 2 mitigation (to be determined by the Albany Museum).
- After vegetation clearing a report must be sent to SAHRA for review and guidance on the way forward.
- Any excavations in the Salnova formation must be examined and sampled by a professional palaeontologist WHILE fresh bedrock is still exposed. The presence of a palaeontologist is required on site soon after exposure.
- Should historic remains be uncovered during construction of the port infrastructure, all works must cease until SAHRA has been contacted to advise the way forward.
- Clear vegetation in a phased manner.
- Areas to be cleared of vegetation or topsoil shall be cleared only when required and shall be rehabilitated immediately on completion of the construction activity in that area.
- Access roads should be kept to a minimum and their length and width should be minimised to reduce the surface area from which dust can be generated.
- When transporting fine materials, dust tarps should be installed on vehicles.
- Limit speeds on access and internal roads to.
- When necessary, appropriate dust control measures (such as wetting of soil14 and covering of stockpiles) shall be implemented.
- Maintain a complaints register to monitor levels of nuisance experienced by neighbours and respond to complaints by increasing the frequency and/or intensity of the dust suppression.
- Existing infrastructure and services within or close to the construction footprint are to be located (via GPR if necessary) and demarcated prior to construction activities commencing.
- Relevant authority agencies and/or Department of the service supplied are to be notified should existing infrastructure be damaged by construction related activities.
- Other users are to be notified of any planned disruptions to services ahead of time.
- Smoking is not to be permitted on site except in designated areas.
- Sufficient fire-fighting equipment to be maintained and be accessible on sites at all times.
- Any incidents or accidents must be recorded, and a record thereof must be kept on site.

- The following construction recommendations from the Damara Tern Impact Assessment must be implemented:
    - The Phase 1 development within the Gas Hub (road loading facility, weighbridge, entrance gate, administrative offices, construction site offices and facilities) must be located in the north-west portion of the Gas Hub, as far from the Damara Tern colony as possible.
    - Ideally, to avoid some of the mitigation measures below, all Phase 1 construction activities east of the south-north pipeline corridor, located approximately 500m west of the Damara Tern colony, should take place outside of the Damara Tern breeding season, 1 October to end February.
    - During the Damara Tern breeding season, 1 October to end February, construction must take place only during daylight hours to take advantage of the unstable atmospheric conditions during the day to ameliorate noise and to prevent lights from vehicles, machinery and the construction site from disturbing the colony.
    - A noise reduction plan, approved by a Professional Engineer and a practitioner qualified in acoustics must be developed with the objective of ensuring that daytime noise levels attributable to construction activities do not exceed 50 dBA at the boundaries of the Damara Tern colony during the Damara Tern breeding season. The plan must detail how this will be measured, monitored and reported on.

- Loud construction activities, especially those causing sudden loud noises (e.g. piling) must be scheduled for periods outside of the Damara Tern breeding season, 1 October to end February.
- All construction vehicles and equipment must be well maintained and in good condition.
- Construction staff should receive "noise sensitivity" training such as switching off vehicles and equipment when not in use.
- A No-Go buffer of 200m around the Damara Tern colony must be permanently demarcated and no activities or human movement are permitted within this buffer. Exceptions would be management activities (such as litter picking) outside the breeding season only and specialist monitoring of the breeding colony.
- During the Damara Tern breeding season 1 October to end February, the boundaries of the construction footprints closest to the Damara Tern colony (generally the southern and south-eastern boundaries) must be fenced off to prevent human access and disturbance and must be screened off to prevent visual disturbance (fence should be a minimum of 2m high with e.g. shade cloth able to withstand the strong winds). There must be no activity between the fence and the Damara Tern colony.
- CDC's Standard Environmental Specifications for Construction must be strictly adhered to. These control most of the negative impacts associated with construction activities (e.g. minimise construction footprint, management of construction material, chemicals and equipment, dust control, waste management, provision and control of ablutions and dining areas, worker induction and toolbox talks).
- All lighting must be down / shielded lighting, not directed towards the Damara Tern colony and should be kept within the site boundaries and at the minimum required for security and health and safety.
- A light audit on a moonless night must be undertaken near the (north-west) boundary of the Damara Tern colony closest to the Gas Hub before construction starts, to establish a baseline and in September of each year (prior to the Damara Tern breeding season). The target should be to ensure a light level of <1 lux on the ground (Jagerbrand & Bouroussis 2021).
- No domestic animals (e.g. feral cats and dogs) are to be tolerated. If present they must be removed to a suitable facility.
- CDC must establish a Damara Tern Management Programme that includes specialist monitoring of the Damara Tern colonies in Algoa Bay by a suitably qualified and experienced professional. An annual report on the status of the Damara Tern population in the Coega SEZ and Algoa Bay, providing management recommendations where appropriate, must be submitted for approval to CDC and the Coega Environmental Monitoring Committee.
- The key performance indicators for the sustainability of the Damara Tern colony are at least three pairs of Damara Terns nesting per year and at least a 33% fledging rate (i.e. at least one chick being successfully reared per year).
- Fencing around the Gas Hub will contain human access and disturbance within the Gas Hub precinct. In addition, during the Damara Tern breeding season 1 October to end February, the south-eastern boundary of the Gas Hub and the west and east boundaries for a distance of at least 200m northwest of their junction with the south-eastern boundary, must be screened off to prevent visual disturbance to the Damara Tern colony (e.g. with shade cloth able to withstand the strong winds). Unfortunately, even a 3m high fence will not adequately screen construction of the larger components of the project.

- The following construction recommendations from the Marine Impact Assessment must be implemented:
  - All dredging activities and associated environmental monitoring must be conducted in accordance with the conditions stipulated under the port expansion authorisation.
  - All contractors must have an approved Environmental Management Plan (EMP) in place that ensures that environmental impacts are minimised as far as practicably possible.

- Ensure that all pile driving is undertaken in accordance with international protocols (e.g. JNCC 2010; DPTI 2012), which stipulate:
    - − Avoid conducting piling activities during times when marine mammals are likely to be breeding, calving, feeding, or resting in biologically important habitats. In Algoa Bay, African Penguins breeding is extended, but nesting usually peaks from March to May; nesting of Cape Gannets extends from August to April. Humpback whales pass through the area around April, continuing through to September/October when the southern migration begins and continues through to December; cow-calf pairs are usually the last to leave and may use Algoa Bay as a resting site on their way south. Southern right whales typically arrive in coastal waters between June and November each year, although animals may be sighted as early as April and as late as January. Southern rights are found in groups of 1-10 individuals, with cow-calf pairs predominating in inshore nursery areas. From July to October, animals aggregate and become involved in surface-active groups, which can persist for several hours. Piling operations should therefore take place between January and March.
    - Use low noise piling methods, such as vibro-driving, instead of impact piling methods where possible.
    - Piling activities should be monitored by Marine Mammal Observers (MMO) and Passive Acoustic Monitoring (PAM) operatives to detect marine mammals and to potentially recommend a delay in the commencement of piling activity if any marine mammals are detected;
    - Establish a 500 m radius mitigation zone around the pile driving activity (measured from the pile location).
    - Prior to the commencement of pile driving operations, the mitigation zone must be monitored visually by MMO and acoustically by PAM for a period of at least 30 minutes.
    - Piling should not be commenced if marine mammals are detected within the mitigation zone or until 20 minutes after the last visual or acoustic detection.
    - Implement a 'soft-start' procedure of at least 10 minutes at the start of piling operations. This involves the gradual ramp-up of piling power allowing marine mammals and fish to move away from the noise source.
    - Piling should not commence in the dark or during periods of low visibility.
    - If a marine mammal enters the mitigation zone during the soft-start then, whenever possible, the piling operation should cease, or at least the power should not be further increased until the marine mammal exits the mitigation zone, and there is no further detection for 20 minutes.
    - When piling at full power, there is no requirement to cease piling or reduce the power if a marine mammal is detected in the mitigation zone. The marine mammal should, however, be continuously monitored by MMO;
    - If there is a pause in the piling operations for a period of greater than 10 minutes, then the pre-piling search and soft-start procedure should be repeated before piling recommences. If a watch has been kept during the piling operation, the MMO or PAM operative should be able to confirm the presence or absence of marine mammals, and it may be possible to commence the soft-start immediately. However, if there has been no watch, the complete pre-piling search and soft-start procedure should be undertaken.
    - The MMO and PAM reports compiled in accordance with JNCC guidelines should be sent to the relevant conservation agency after the end of the piling activity.
- Include the standard management and mitigation procedures, and any in the contract documentation of the construction contractor.
- Consider the use of a bubble curtain. As the noise from pile driving is transmitted through the sediment into the water, bubble screens do not eliminate all behavioural responses to the piling noise, but reported noise reductions range from 3 to 20 dB (Würsig et al. 2000; DPTI 2012).

- The following construction recommendations from the Noise Impact Assessment must be implemented:
  - All construction operations should only occur during daylight hours if possible.
  - No construction piling should occur at night where possible. Piling should only occur during the day to take advantage of unstable atmospheric conditions.
  - Construction staff should receive "noise sensitivity" training such as switching off vehicles when not in use, location of NSA's etc.
  - An ambient noise survey should be conducted at the noise sensitive receptors during the construction phase.

- The following construction recommendations from the Terrestrial Ecological Impact Assessment must be implemented:
  - All necessary permitting and authorisations pertaining to indigenous terrestrial biodiversity (i.e., plants and animals) must be obtained prior to the commencement of any construction activities.
  - A suitably qualified ECO must be appointed prior to the commencement of the construction phase. If this appointment is to be done in-house by the CDC, then it is important to ensure that the ECO has sufficient knowledge of the local fauna and flora. If not, an external specialist might need to be appointed.
  - Except to the extent necessary for the carrying out of construction works, plants shall not be removed, damaged, or disturbed. The clearance of vegetation at any given time should be kept to a minimum and vegetation clearance must be strictly limited to the development footprint(s).
  - Ground truthing of the development footprint(s) must be conducted by an experienced botanist prior to vegetation clearance to ensure that no populations of rare and/or threatened plant species will be lost. If populations of rare and/or threatened species are present within the development footprint(s), then the associated infrastructure (i.e., pipeline servitude, LNG Hub site) should be moved to avoid these areas. Only plant SCC which are known to survive translocation should be relocated to the nearest appropriate habitat.
  - A thorough Search and Rescue (S&R) for plant SCC should be conducted prior to vegetation clearance. This must be carried out in accordance with the Project Vegetation Specification (PVS) by a competent and qualified service provided.
  - In areas where vegetation density restricts access and the ability of S&R teams to conduct thorough searches, strip clearing of the thicket vegetation using a tractor loaded backhoe (TLB) is permitted to allow access into the dense vegetation for the S&R efforts.
  - Except to the extent necessary for the carrying out of the Works, fauna shall not be removed, injured, disturbed, or killed. Trapping, poisoning, poaching and/or shooting of fauna is strictly forbidden. No domestic pets or livestock are permitted on site.
  - A thorough Search and Rescue (S&R) for herpetofauna SCC should be conducted prior to vegetation clearance by a qualified herpetologist. If found, herpetofauna SCC's should be placed in similar habitat directly adjacent to the affected area.
  - The priority biodiversity areas delineated by the Coega OSMP, including the Ecological Support Area and the Secondary Dune have been classified as HIGH sensitivity and the strict management/mitigation measures as specified in the approved OSMP (2014) and Section 8.1 of this report must be applied to development in or near these areas.
  - The Alien Vegetation Management Plan developed for the Coega SEZ must be implemented and managed to prevent the further spread of alien invasive species within Zone 10 of the Coega SEZ. This requires active management and maintenance.
  - A comprehensive Rehabilitation Plan must be compiled and implemented. Only indigenous plant species typical of the local vegetation should be used for rehabilitation purposes. This requires active management and maintenance.

- An Erosion Management Plan must be developed prior to the commencement of construction activities to mitigate the unnecessary loss of topsoil and runoff. This requires active management and maintenance.
- Activities within 500 m upstream of a wetland must obtain the necessary Water Use License prior to the commencement of such activities.
- Lay down areas must not be located within any watercourses or drainage lines.

- The following construction recommendations from the Traffic Impact Assessment must be implemented:
  - Provide suitable traffic accommodation measures as part of construction contract to inform other road users of presence of construction related traffic.
  - Traffic accommodation measures to be provided in terms of Chapter 13 of the South African Road Traffic Signs Manual. Measures to be provided subject to approval by the Engineer.
  - Ensure construction traffic is confined to site area where possible.
  - Minimise need for continuous construction traffic on Ring Road by confining construction traffic to the site.
  - Ensure that vehicle loads are within legislated limits, i.e. maximum Gross vehicle mass of 56 000kg
  - Source relevant permits from the Eastern Cape Department of Transport should abnormal loads be required for transport of components.
  - Provide suitable traffic accommodation measures as part of construction contract to inform other road users of presence of construction related traffic, including speed restriction signage; and
  - Increased law enforcement protocols.

- The following design and construction recommendations from the Socio-economic Impact Assessment must be implemented:
  - Local employment (unskilled, semi- and skilled workers) as well as the number of local SMMEs and vendors must be maximised. Set standards for local employment in the Contractor Services Management Plans.
  - Implement a fair and transparent employment process and employ a Community Employer Relations Officer for the duration of the construction period.
  - Implement a SMME skills development programme (training on how to tender, understanding contracts, etc.) at least 4 months prior to inviting SMMEs to tender. The programme must not only assist local small businesses but also aim to do skills development for the local Municipality.
  - A policy regarding employment equity of minority groups must be formulated and implemented wherever possible.
  - As part of the tender documents, the Contractor/s must provide subcontracting values per package and the plan on how they will meet procurement of minority groups (women, youth, disabled) and SMMEs targets assigned.
  - Relevant measures must be implemented should the Contractor/s not comply with the social management plan that they submitted (impose penalties, termination where necessary, review of future prospective work, etc.).
  - A local procurement strategy, specifically aimed at increasing the local content of the Project to its maximum, must be implemented.
  - A value-chain analysis of services required (directly and indirectly related to construction such as transport, laundry, catering, uniform supplies, etc.) must be undertaken.
  - Contractually obligate contractors and subcontractors must employ temporary workers through the labour desk/job seeker registration database and make this fact known to the communities.
  - The study area and the beneficiary communities who would benefit through employment, equity, SED and ED spend must be clearly defined.
  - Larger contractors must be required to work with small SMMEs to train and transfer skills. This must be included in the CEMP.

- The following construction recommendations from the Safety Risk Assessment must be implemented:
  - Installation of instrumentation, including detection and emergency shut down.

10.8.2 OPERATIONAL RECOMMENDATIONS

The following mitigation measures must be implemented during the operational phase:

- CDC must maintain infrastructure and services associated the proposed Gas Infrastructure.
- The developer must identify and separate materials that can be reused or recycled to minimise waste e.g. metals, packaging and plastics, and provide separate marked bins/ skips for these items. These wastes must then be sent for recycling and records kept of recycling.
- No dumping within the surrounding area shall be permitted, and no waste may be buried or burned on site.
- Sufficient portable on-site weather & vermin proof bins with lids need to be provided and appropriately placed and emptied regularly (contents to be disposed of at a licenced landfill site, and proof of disposal retained for auditing purposes).
- Cleared alien vegetation should be disposed of so that it does not re-establish on site.
- Regular (weekly) waste collection service to be provided.
- All staff shall be trained on correct waste management.
- Implementation of a site specific stormwater management plan, in accordance with the CDC's overarching stormwater management strategy for the SEZ, to ensure stormwater exiting the site meets the requirements in terms of quality and volume.
- Harvesting of rainwater and stormwater where possible for use on site.
- Separation of clean and dirty stormwater on site and treatment of dirty stormwater prior to discharge; Ensure all storage and handling of hazardous liquids takes place over an impermeable surface to capture any leaks or spills for disposal or further treatment.
- Include bunding to at least 110% of storage capacity around all fuel and chemical storage vessels where appropriate to do so, to capture any spills / leaks.

- The following operational recommendations from the Climate Change Impact Assessment must be implemented:
  - Source LNG from nearby suppliers such as northern Mozambique, to reduce upstream transport emissions.
  - Source LNG from responsible suppliers, reducing emissions associated with extraction and upstream processing of the LNG.
  - Use good quality equipment to reduce the amount of natural gas that escapes as fugitive emissions and reducing the need for flaring.
  - The designs of infrastructure and processes must consider the potential impact of extreme weather events such as severe storms/storm surge, severe winds, extreme heat, heavy rains, and flooding impacts. The corrosive nature of maritime climate on infrastructure and equipment must be taken into account in design and maintenance.
  - The designs for the piping must account for increasing ambient temperatures as well as an increased frequency of very hot days and the associated material fatigue.
  - Safety protocols must take into consideration the impacts of climate change on construction and operations. This includes the introduction of disaster management policies, as well as onsite employee training, specifically for risk management of extreme weather events.
    Design of an on-site stormwater drainage system, and implementation of a stormwater management plan.
  - Improve storm water drainage capacity to minimise flood occurrences onsite and the associated contamination occurrences.
  - Use a closed-loop water system for the Gas Infrastructure to minimise water losses to evaporation, and reduce water consumption.

- The following operational recommendations related to the Damara Tern Impact Assessment must be implemented:
  - Phase 1 of the Gas Hub (the road loading facility) must be fenced off to contain human access and disturbance within the facility. The south east boundary (closest to the Damara Tern colony) must be sufficiently high (e.g. 3m) and screened off (ideally with a wall) to prevent visual disturbance to the colony, especially from vehicle headlights. Ideally the road loading facility should operate during daylight hours only (during the Damara Tern breeding season, 1 October to end February) to minimise disturbance to the colony from vehicle headlights.
  - Planned maintenance of the gas pipelines east of the south-north corridor must not take place during the Damara Tern breeding season, 1 October to end February. If emergency repairs or inspections are required during the Damara Tern breeding season they should be undertaken during daylight hours and the work site should be screened off (e.g. high fence, shadecloth), in a similar manner to that required by the construction phase mitigation.
  - CDC's Operational Safety, Health and Environmental Management Plan for the Coega SEZ must be complied with. This management plan is applicable to all tenants and governs the management, monitoring and reporting requirements for most operational activities (e.g. environmental awareness, waste, storm-water, waste- water, air quality management, noise control, pollution control, management of hazardous substances, emergency preparedness, visual impacts, alien vegetation management, species of conservation concern, problem animal control, resource management).

- The following operational recommendations from the Noise Assessment must be implemented:
  - The noise impact from the proposed Gas Infrastructure should be measured during the operational phase, to ensure that the impact is within the required legal limit.

- The following operational recommendations from the Marine Impact Assessment must be implemented:
  - All dredging activities and associated environmental monitoring must be conducted in accordance with the conditions stipulated under the port expansion authorisation.
  - All contractors must have an approved Environmental Management Plan in place that ensures that environmental impacts are minimised as far as practicable possible.
  - Design intakes to minimise entrainment or impingement by reducing the average intake velocity to about 0.1 to 0.15 m/s. This is comparable to background currents in the oceans, and will allow mobile organisms to swim away from the intake under these flow conditions (UNEP 2008).
  - Optimise operating modes in the open-loop system as far as possible to reduce impacts, or use closed-loop systems in recruitment areas or during periods when abundances of eggs and larvae are seasonally high.
  - The developer is to undertake an entrainment study prior to the commencement of construction to more accurately determine the potential impacts of impingement and entrainment on communities within the Port of Ngqura.
  - The LNGCs must have a Ballast Water Management Plan in place.
  - Ballast water exchange must be done at least 200 nautical miles from the nearest land in waters of at least 200 m deep; the absolute minimum being 50 nautical miles from the nearest land.
  - Ensure that routine cleaning of ballast tanks to remove sediments is carried out, where practicable, in mid-ocean or under controlled arrangements in port or dry dock, in accordance with the provisions of the ship's Ballast Water Management Plan.
  - Use filtration procedures during loading of ballast in order to avoid the uptake of potentially harmful aquatic organisms, pathogens and sediment that may contain such organisms.
  - Optimise operating modes in the open-loop system as far as possible to reduce impacts, or use closed-loop systems whenever practicable.
  - Use multi-port discharges and adjust discharge rate to facilitate enhanced mixing with the receiving water body.

- Ports should discharge horizontally or within -45° of horizontal to maximise dilution and avoid erosion of the sediments where the jet hits the seabed.
- Neutralise NaOCl with SMBS prior to discharge to ensure that the most conservative international guideline value (<2 µg/ℓ) for residual chlorine at the point of discharge is met.
- Blend the brine with the cooling/heating water prior to release.
- Reduce lighting in non-essential areas.
- Use guards to direct lights to areas requiring lighting.
- Avoid direct light in water, exept during safety inspections.
- Use Low light mounting where possible.
- Use long wavelength lights that are less intense for nocturnal animals.
- Implement leak detection and repair programmes for valves, flanges, fittings, seals, etc.
- Use a low-toxicity biodegradable detergent for the cleaning of all deck spillage.
- Prepare an emergency response plan covering recommended measures to prevent and respond to LNG spills.
- The hypochlorite generation unit must be suitably bunded to prevent and spills from the plant entering the marine environment.
- Ensure that vessel speed is kept below 10 knots when underway in Algoa Bay.
- The vessel operators should keep a constant watch for slow-swimming large pelagic fish, marine mammals and turtles in the path of the vessel.
- Ensure that all project-associated vessels have an oil spill contingency plan in place.
- As far as possible, and whenever the sea state permits, attempt to control and contain the spill at sea with suitable recovery techniques to reduce the spatial and temporal impact of the spill.
- Ensure adequate resources are provided to collect and transport oiled birds to a cleaning station.
- Refuelling is to take place only under controlled conditions within the port.

- The following operational recommendations related to the Safety Risk Assessment must be implemented:
  - Installation and maintenance of monitoring instrumentation including detection and emergency shut-down facilities.

- The following operational recommendations related to the Socio-Economic Assessment must be implemented:
  - Recruit local labour as far as feasible to increase the benefits to the local households.
  - Sub-contract to local maintenance companies where possible.
  - Use local suppliers where feasible and arrange with local SMMEs and BBBEE compliant enterprises to provide transport, catering and other services to the maintenance crews.

10.8.3 DECOMMISSIONING RECOMMENDATIONS

The following mitigation measures must be implemented during the operational phase:

- This section of mitigation measures must be reassessed by a suitably qualified EAP and specialists prior to decommissioning.
- Littering must be avoided, and litter bins must be made available at various strategic points on site. Refuse from the construction site must be collected on a regular basis and deposited at an appropriate landfill.
- Fugitive/nuisance dust must be reduced by implementing one of or a combination of the following
  - Damping down of un-surfaced and un-vegetated areas;
  - Retention of vegetation where possible;
  - Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas;
  - A speed limit of 40km/h must not be exceeded on dirt roads;

- Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.
- Construction vehicles and machinery must make use of existing infrastructure such as roads as far as possible to minimise disturbance on the receiving environment.
- After the removal of all gas infrastructure-related structures, the disturbed soils must be re-vegetated to avoid unnecessary soil erosion.

10.8.4 MONITORING RECOMMENDATIONS

Monitoring recommendations related to the Construction Phase:

- Monitoring by an archaeologist and palaeontologist must take place during all earthmoving activities, including, but not limited, to trenching and piling.
- An alien invasive vegetation monitoring and control programme must be implemented throughout the construction and defects notification period, to clear alien invasive vegetation from all areas affected by construction activities and prevent its regrowth.

Monitoring recommendations related to the Damara Tern Impact during operation include:

- CDC to establish a Damara Tern Management Program within the CDC OSMP mechanisms, which incorporates:
  - Specialist monitoring of the Damara tern population to determine the extent of their habitat, by an expert with previous experience monitoring this species,
  - An annual report on the status of the SEZ Damara tern population, and approval of the annual report / management plan by the EMC.
  - Continued monitoring of the Damara Tern population must be implemented.

Monitoring recommendations related to the Marine Impacts during operation include:

- During pile-driving operations monitoring by Marine Mammal Observers (MMO) and Passive Acoustic Monitoring (PAM) operatives to detect marine mammals must be undertaken;
- Engage an acoustic consultant to undertake a site-specific underwater noise assessment.
- Undertake an entrainment study to more accurately determine the potential impacts of impingement and entrainment on communities within the Port of Ngqura.
- Implement an invasive species monitoring programme both in the harbour and on the St Croix Island Group.

11 EAP AFFIRMATION

Report Title: Coega Gas Infrastructure: Environmental Impact Assessment Report
Report Version: *Draft*
Department of Forestry, Fisheries and Environment (DFFE) Reference Number: 14/12/16/3/3/2/2265
Coastal & Environmental Services Project Code: P40700856

Environmental Assessment Practitioner (EAP) Details

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EAP Declaration

- I act as the independent environmental practitioner in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not;
- All of the particulars furnished by me in this form are true and correct; and
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations.

ENVIRONMENTAL CONSULTANT	RESPONSIBILITY	DATE
Alan Carter	*Project Leader & Reviewer*	February 2022
Luc Strydom	*EAP, Project Manager & Author*	February 2022
Sage Wansell	*Co-Author & PPP*	February 2022

PLEASE FIND HERE WITHIN A SIGNED COPY OF THE DEPARTMENTAL EAP DECLARATION

12 APPENDIX A: PPP DOCUMENTATION

12.1 BACKGROUND INFORMATION DOCUMENT

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

BACKGROUND INFORMATION DOCUMENT (BID) & INVITATION TO COMMENT

NOTIFICATION OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED COEGA GAS TO POWER INFRASTRUCTURE PROJECT, COEGA SEZ, GQEBERHA, EASTERN CAPE PROVINCE.

AIM OF THIS DOCUMENT

The purpose of this document is to ensure that people that are interested in, or affected by, the proposed development are provided with the information about the project, the process being followed and provided with an opportunity to be involved in the Scoping and Environmental Impact Assessment (EIA) process for the proposed Coega Gas to Power Project, including three power plants and associated Infrastructure, within the Coega Special Economic Zone (SEZ), Eastern Cape Province.

An EIA process was undertaken in 2020/2021 (DFFE Ref: 14/12/16/3/3/2/1131) for the Coega Gas to Power Infrastructure project, and the Final Scoping Report was accepted by DFFE on 6 January 2021. Ultimately, environmental authorisation was refused due to incorrect proof of landowner consent and insufficient information within the EIR for the Department to make a decision.

The deadline for the submission of the Final Environmental Impact Assessment Report (EIAR) was the 26th of April 2021. However, on the 19th of April 2021, the appointed service provider and the CDC received feedback on the Draft EIAR from the DFFE stipulating that additional specialist input was required to be undertaken to determine the impact of the anticipated noise generated by the proposed project on the nearby Damara Tern colony. This specialist assessment was conducted and submitted on the 28th of August 2021. However, CDC received a Record of Refusal, in terms of Regulation 24(1)(b)), on the 18th of August 2021.

The EIA phase (phase 2) includes an EIR (prepared in accordance with Appendix 3 of GN R. 982), specialist reports (prepared in accordance with Appendix 6 of GN R. 982) and an Environmental Management Programme (EMPr) (prepared in accordance with Appendix 4 of GN R. 982). This phase must also undergo Public Participation Process in accordance with Chapter 6 of GN R. 982.

Registering as an Interested and/or Affected Party (I&AP) allows individuals or groups the opportunity to contribute ideas, issues and concerns relating to the project. I&APs also have an opportunity to review all the reports and submit their comments on those reports. The Final Scoping Report and DFFE Acceptance letter is also available to I&APs and Stakeholders upon request. All the comments which are received during this process will be included in the final reports, which are then submitted to the relevant Competent Authority, the National Department of Environment, Forestry and Fisheries (DEFF).

THE SCOPING AND ENVIRONMENTAL IMPACT REPORTING PROCESS

According to the National Environmental Management Act (NEMA) (Act No. 107 of 1998 and subsequent amendments) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments), the potential impacts on the environment will have to be assessed in terms of the listed activities. These environmental listed activities, initially published on the 21st of April 2006, were amended in 2010, 2014 and again on the 7th of April 2017, as Government Notice (GN) Numbers R. 983 (GN R. 327), R. 984 (GN R. 325), and R. 985 (GN R. 324) which define the activities which require, respectively, a Basic Assessment (GN R. 983 and GN R. 985 listed activities which apply to activities with limited environmental impacts), or a Scoping and EIA process (GN R. 984 listed activities which apply to activities which are significant in extent and duration).

The proposed development triggers activities contained in Listing Notice 2 (GN R. 984, as amended by GN R. 325) of the NEMA EIA Regulations (2014 and subsequent 2017 amendments) and therefore requires a full Scoping and EIA Process. As part of the Scoping and EIA Process, as well as Regulation 41 of the NEMA EIA Regulations (2014 and subsequent 2017 amendments), CES (on behalf of the Applicant) must consult with the landowners, occupiers, abutting landowners and the public and submit the results of such consultation to the Competent Authority.

Table 1: NEMA Listed Activities triggered by the proposed development.

GOVERNMENT NOTICE	ACTIVITY NUMBER	ACTIVITY DESCRIPTION	DESCRIPTION OF PROJECT ACTIVITY THAT TRIGGERS LISTED ACTIVITY
GN R. 327 (EIA Listing Notice 1)	15	The development of structures in the coastal public property where the development footprint is bigger than 50 square metres, excluding - (i) the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour;	The cryogenic and natural gas pipelines, firewater as well as the seawater intake pipeline, include footprints exceeding 50 m2 outside the port and within coastal public property.
	17	Development- (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 — (e) infrastructure or structures with a development footprint of 50 square metres or more —	Mooring facilities in the port and infrastructure for intake of seawater and transport of LNG and gas to storage facilities and the power plants are proposed within 100 m of the high water mark of the sea and within the littoral active zone. This includes a new jetty, offloading platform and trestle to support the LNG and gas pipelines within the port, a cryogenic pipeline as well as gas pipelines associated with land-based regasification infrastructure, firewater pipeline and a seawater intake pipeline from the port to the Zone 10 power plants

GOVERNMENT NOTICE	ACTIVITY NUMBER	ACTIVITY DESCRIPTION	DESCRIPTION OF PROJECT ACTIVITY THAT TRIGGERS LISTED ACTIVITY
			and onshore regasification areas at the LNG and Gas Hub
	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, excluding where - (i) the planting of vegetation or placement of material relates to restoration and maintenance of indigenous coastal vegetation undertaken in accordance with a maintenance management plan; or (ii) such planting of vegetation or placing of material will occur behind a development setback.	LNG and gas pipelines, seawater intake pipeline, and LNG and gas hub will be constructed within the littoral active zone/dunes and will therefore require stabilisation measures, exceeding 10 m^2. This may include planting of vegetation as part of rehabilitation of the site during construction. The CDC's Standard Vegetation Specification for Construction (dated 2005) will be adhered to, however specific measures to address revegetation of coastal vegetation will be required.
	19A	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- (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing , dredging, excavation, removal or moving- (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance	Excavations, infilling or deposition (in excess of 5 m^3) will be required for the proposed pipelines and infrastructure within Zone 8 and 10 of the Coega SEZ, including a new jetty and trestle structure within the port. This will take place within 100 m inland of the high water mark and within the littoral active zone. **Dredging within the port for construction of the jetty and mooring platform will be required, however it is understood that this activity has already been authorised under the existing RoD for the port and therefore is not specifically applied for.**

GOVERNMENT NOTICE	ACTIVITY NUMBER	ACTIVITY DESCRIPTION	DESCRIPTION OF PROJECT ACTIVITY THAT TRIGGERS LISTED ACTIVITY
		behind a development setback.	
	19A	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- (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing , dredging, excavation, removal or moving- (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies	Excavations, infilling or deposition (in excess of 5 m^3) will be required for the proposed pipelines and infrastructure within Zone 8 and 10 of the Coega SEZ, including a new jetty and trestle structure within the port. This will take place within 100 m inland of the high water mark and within the littoral active zone. Dredging within the port for construction of the jetty and mooring platform will be required, however it is understood that this activity has already been authorised under the existing RoD for the port and therefore is not specifically applied for.
	27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear	The LNG & gas hub will require the clearing of vegetation. It is anticipated that this will be up to approximately 181,000 m2. The equivalent/similar activity is authorised in the 2007 Rezoning EA for the SEZ, and therefore clearing of

GOVERNMENT NOTICE	ACTIVITY NUMBER	ACTIVITY DESCRIPTION	DESCRIPTION OF PROJECT ACTIVITY THAT TRIGGERS LISTED ACTIVITY
		activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	**vegetation will not be applied for or assessed in this EIA.**
GN R. 325 (EIA Listing Notice 2)	4	The development of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.	The proposed Gas Infrastructure includes both on & off-shore infrastructure for storage of up to approximately 340,000 m³ of LNG, and other dangerous goods such as chemicals and fuels.
	6	The development of facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent	The development of the Gas Infrastructure will require licences, including an Atmospheric Emission Licence in terms of NEM:AQA (Act 39 of 2004) for the storage of fuel and potentially a coastal waters discharge permit may also be required for the discharge of heating water required for regasification
	7	The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods– (i) in gas form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity of more than 700 tons per day; (ii) in liquid form, outside an industrial	All proposed infrastructure for the conveyance of LNG and Natural Gas falls within the Coega SEZ and the Port of Ngqura, and will be in pipelines exceeding 1 km in length, with throughput capacities exceeding the thresholds specified. In the event that either of these activities are deemed to occur outside of an industrial complex, then this activity would be triggered.

GOVERNMENT NOTICE	ACTIVITY NUMBER	ACTIVITY DESCRIPTION	DESCRIPTION OF PROJECT ACTIVITY THAT TRIGGERS LISTED ACTIVITY
		complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity of more than 50 cubic metres p-er day	
	14	The development and related operation of- (ii) an anchored platform; or (iii) any other structure or infrastructure on, below or along the sea bed;	The development of an LNG terminal for the FSRU will require the construction of a jetty and mooring structures, as well as a trestle running inside the harbour breakwater to support the gas and LNG pipelines. All of these will require the construction of piling or other structures into the sea bed for support.

The Applicant, or the EAP on behalf of the Applicant, is initially required to submit a report detailing the Scoping Phase (Scoping Report – completed) and set out the ToR for the EIA Process (Plan of Study for EIA). This is then followed by a report detailing the EIA Phase, the Environmental Impact Report (EIR). The Competent Authority will issue a final decision subsequent to their review of the Final EIR.

The Competent Authority that must consider and decide on the application for authorisation in respect of the activities, listed in Table 1 above, is the National Department Forestry, Fisheries and the Environment (DFFE) as the Department has reached an agreement with all Provinces that all electricity-related projects, including generation, transmission and distribution, are to be submitted to the National DFFE, irrespective of the legal status of the Applicant. This decision has been made in terms of Setion 24(C)(3) of the NEMA (Act No. 107 of 1998 and subsequent amendments).

In addition to the requirements for an Environmental Authorisation (EA) in terms of the NEMA, there may be additional legislative requirements that need to be considered prior to commencing with the activity, these include but are not limited to:

- National Heritage Resources Act (Act No. 25 of 1999);
- National Water Act (Act No. 36 of 1998);
- Civil Aviation Act (Act No. 74 of 1962) as amended;
- National Environmental Management Biodiversity Act (Act No. 10 of 2004);

- National Forests Act (Act No. 84 of 1998); and the
- Eastern Cape Nature and Environmental Conservation Ordinance (No. 19 of 1974).

PROJECT DESCRIPTION

At the outset, it is important to note that this description is deliberately non-specific in terms of the proprietary technologies that would be required for the overall site development. As the specific technology providers have not yet been selected, the approach in this report is to describe each of the components of the development using typical/standard Gas to Power plant design information.

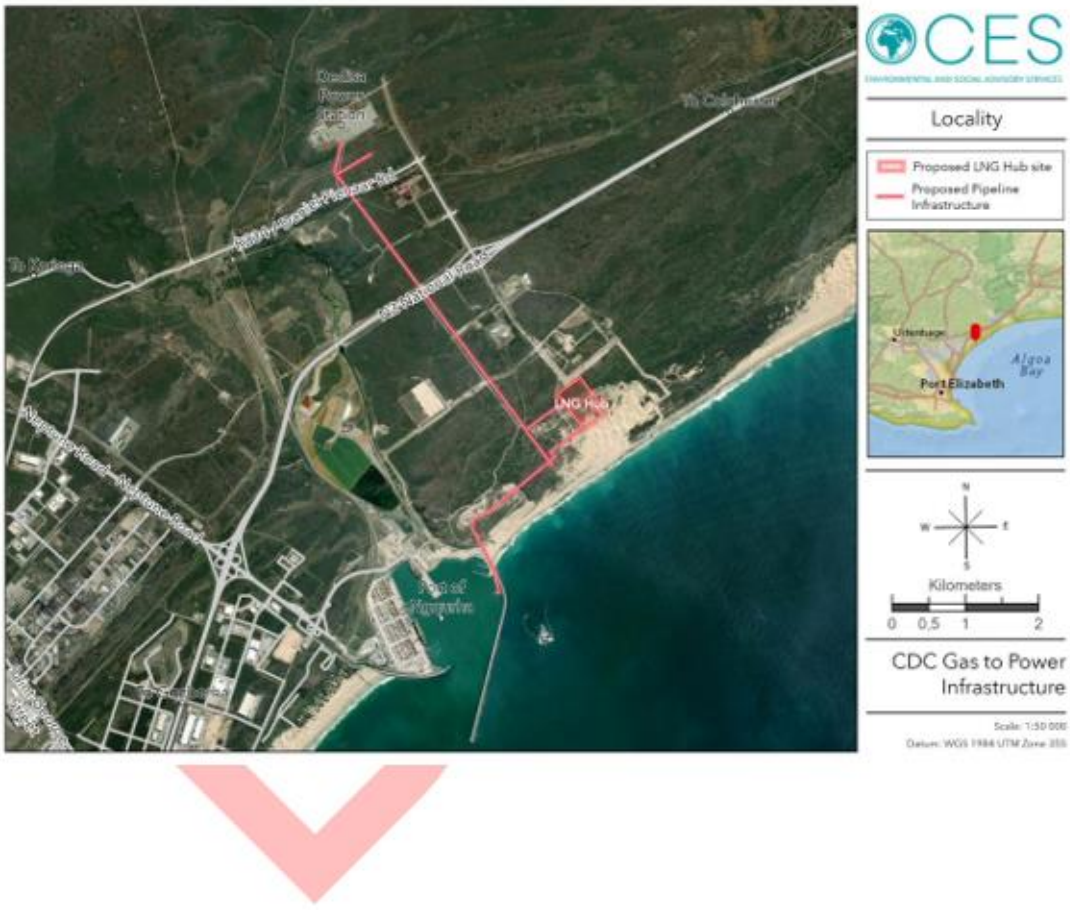
Where the different technologies that reasonably might be procured for this project have differing potential impacts, the worst case scenario was assessed. The basis of the design for the power plants, and the associated infrastructure, is that the power plants would operate at 100% capacity 80% of the time and the assessment of environmental impacts is based on the quantities associated with this design basis.

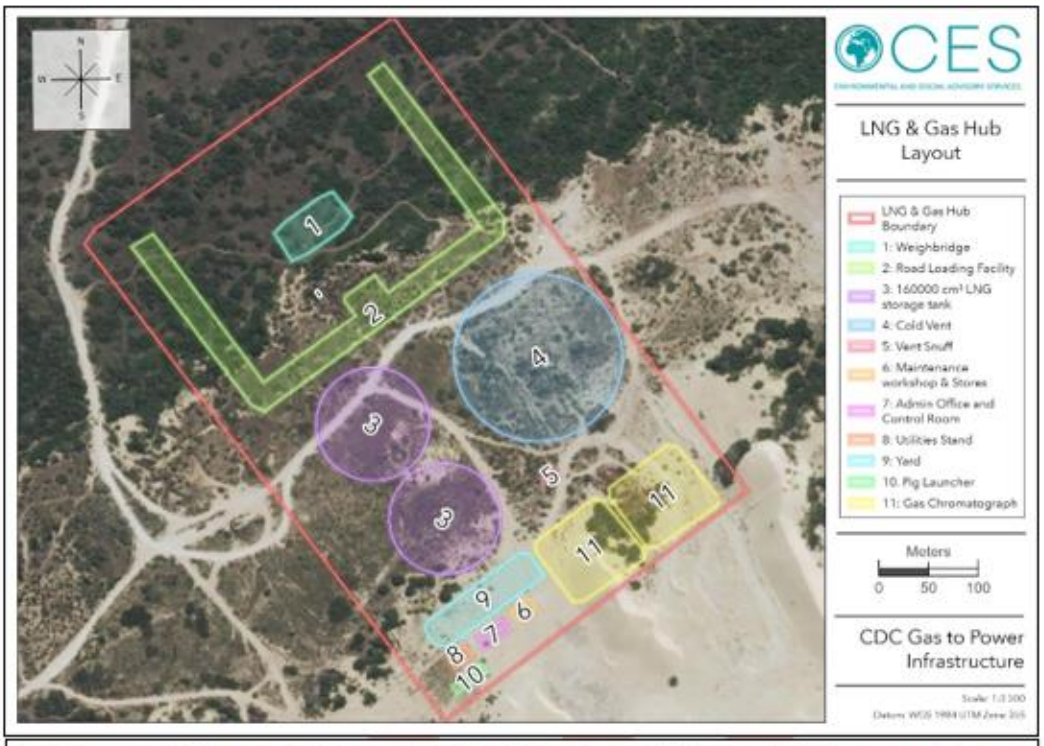
The proposed Gas Infrastructure will consist of all key supporting infrastructure required for the operation of the CDC's proposed Gas to Power plants in the Coega SEZ. This will be made up specifically of infrastructure for the import, storage and transmission of LNG via the Port of Ngqura, to the various power plants, and seawater for cooling to and from the Zone 10 power plants (should they be seawater cooled), and heating water to the onshore storage and regasification unit. Additional capacity of supply of LNG and natural gas (NG) to third party offtakers, potentially including the Dedisa peaking power plant, should this be converted to gas, will also be included. The key infrastructure includes the following:

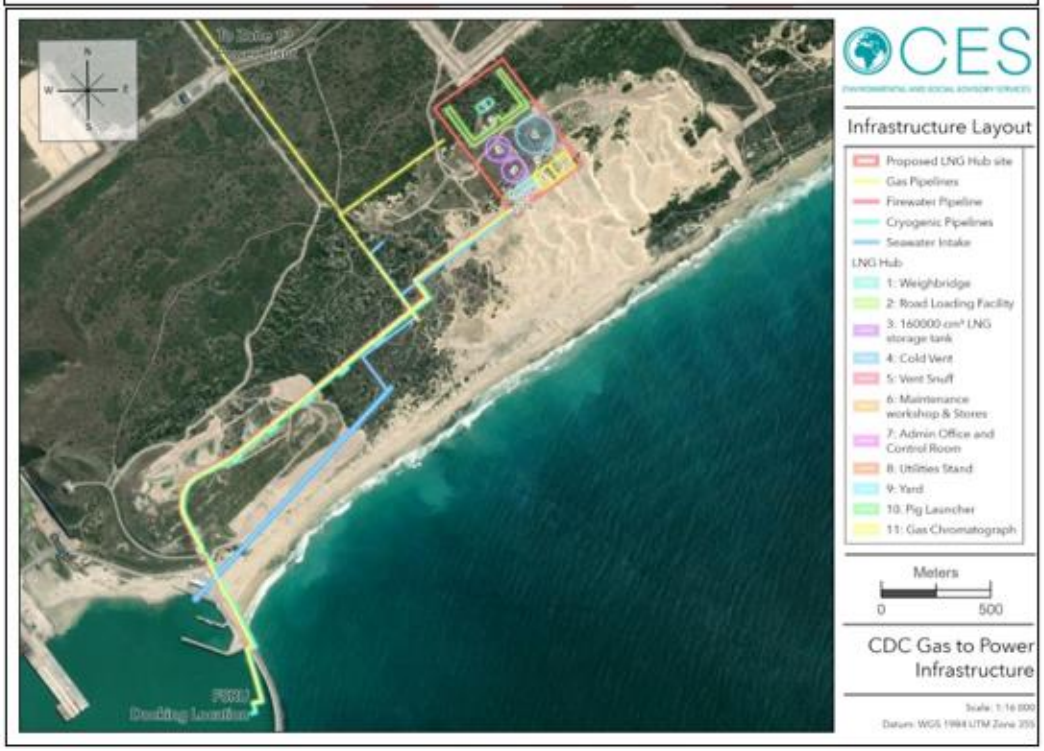
- Up to two floating storage and regasification units (FSRUs), moored in the Port, which will receive, store and regasify the LNG from the LNG carrier. It is proposed that onshore storage and regasification facilities will replace the FSRUs once the demand for NG reaches a point where onshore storage and regasification is the more feasible option, at which point the FSRUs will be removed
- A new jetty with offloading platform and berthing facilities in the port of Ngqura
- A trestle structure to support the gas and cryogenic pipelines running within the port from the offloading platform parallel to the eastern breakwater, to the point where the pipelines will cross under the breakwater near the admin craft basin, thereafter running underground
- A LNG and gas hub, consisting of storage and regasification facilities (for development once the FSRU is no longer the most feasible option), and a truck delivery centre for third party offtakers. Gas metering, admin, control rooms, workshops, and vents will be included in the LNG and gas hub
- Gas pipelines (for transmission of NG) from the FSRU and jetty to the three proposed power plants, the LNG and gas hub (for third party offtakers) as well as the boundary of the Dedisa power plant in Zone 13
- Cryogenic pipelines (for transmission of LNG) from the berthing facilities in the port to the storage and regasification unit at the LNG and gas hub (once this has replaced offshore storage and regasification at the FSRU)

- Pipelines for the transmission of seawater for cooling from the abstraction point in the port, to the Zone 10 power plants (if seawater cooled), and for heating to the regasification plant at the LNG and gas hub in Zone 10

LAYOUT AND LOCALITY MAP



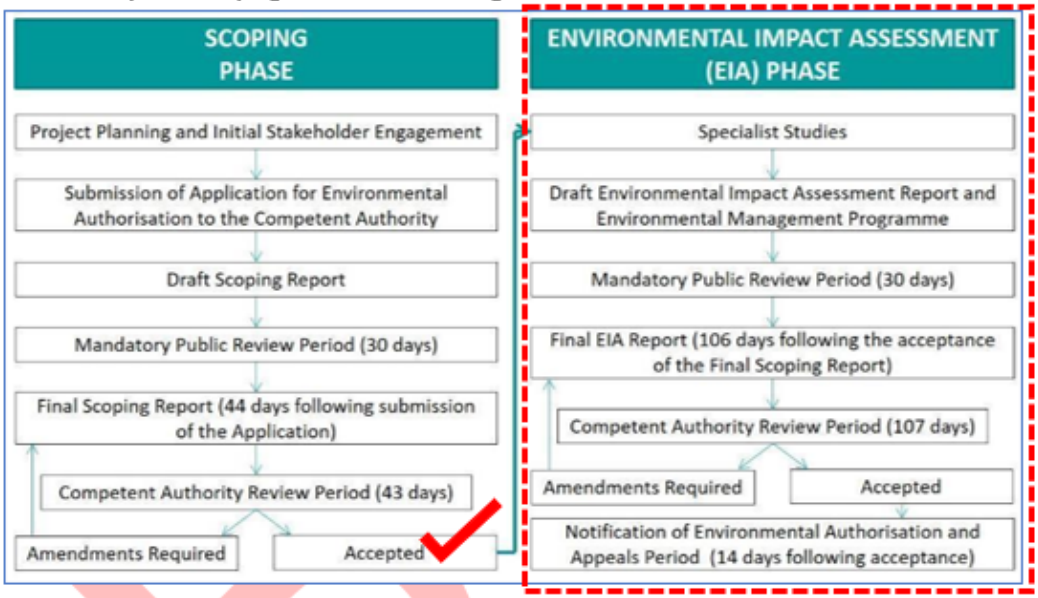

CES
LNG & Gas Hub Layout
LNG & Gas Hub Boundary
1: Weighbridge
2: Road Loading Facility
3: 160000 cm³ LNG storage tank
4: Cold Vent
5: Vent Snuff
6: Maintenance workshop & Stores
7: Admin Office and Control Room
8: Utilities Stand
9: Yard
10: Pig Launcher
11: Gas Chromatograph
Meters
0 50 100
CDC Gas to Power Infrastructure


CES
Infrastructure Layout
Proposed LNG Hub site
Gas Pipelines
Firewater Pipeline
Cryogenic Pipelines
Seawater Intake
LNG Hub
1: Weighbridge
2: Road Loading Facility
3: 160000 cm³ LNG storage tank
4: Cold Vent
5: Vent Snuff
6: Maintenance workshop & Stores
7: Admin Office and Control Room
8: Utilities Stand
9: Yard
10: Pig Launcher
11: Gas Chromatograph
Meters
0 500
CDC Gas to Power Infrastructure

APPROACH TO THE SCOPING AND EIR PROCESS

The proposed project triggers activities contained in Listing Notice 2 (GN R. 984, as amended by GN R. 325) of the of the NEMA EIA Regulations (2014 and subsequent 2017 amendments) and therefore requires a **full Scoping and EIA Process**. The Scoping Report was completed and accepted by the department in January 2021 during the previous application process as mentioned above. The relevant Competent Authority for the Environmental Assessment Process is DFFE.

Table 2: Simplified Scoping and EIA Process Diagram.



POTENTIAL IMPACTS AND BENEFITS

A number of specialist studies are proposed in the Impact Assessment phase in order to investigate the potential environmental impacts associated with the proposed development. The identification of impacts and terms of reference for specialist studies is based on:

- The legal requirements;
- The nature of the proposed activity;
- The nature of the receiving environment;
- Discussions with DFFE regarding their requirements during pre-application meetings for the project; and
- Issues raised during the public participation programme.

The proposed specialist studies to be conducted during the Impact Assessment phase are as follows:

- Air Quality Impact Assessment;
- Traffic Impacts;
- Quantitative Risk Assessment;
- Climate Change Impact Assessment;
- Noise Impacts; and

Telephone Number:	+27 874057499
E-mail Address:	cesppp@cesnet.co.za
Website:	www.cesnet.co.za

12.2 ADVERTISEMENT

Advert to be placed in The Herald:

INSERT ADVERT PROOF HERE WITH DATE**

12.3 SIGNAGE

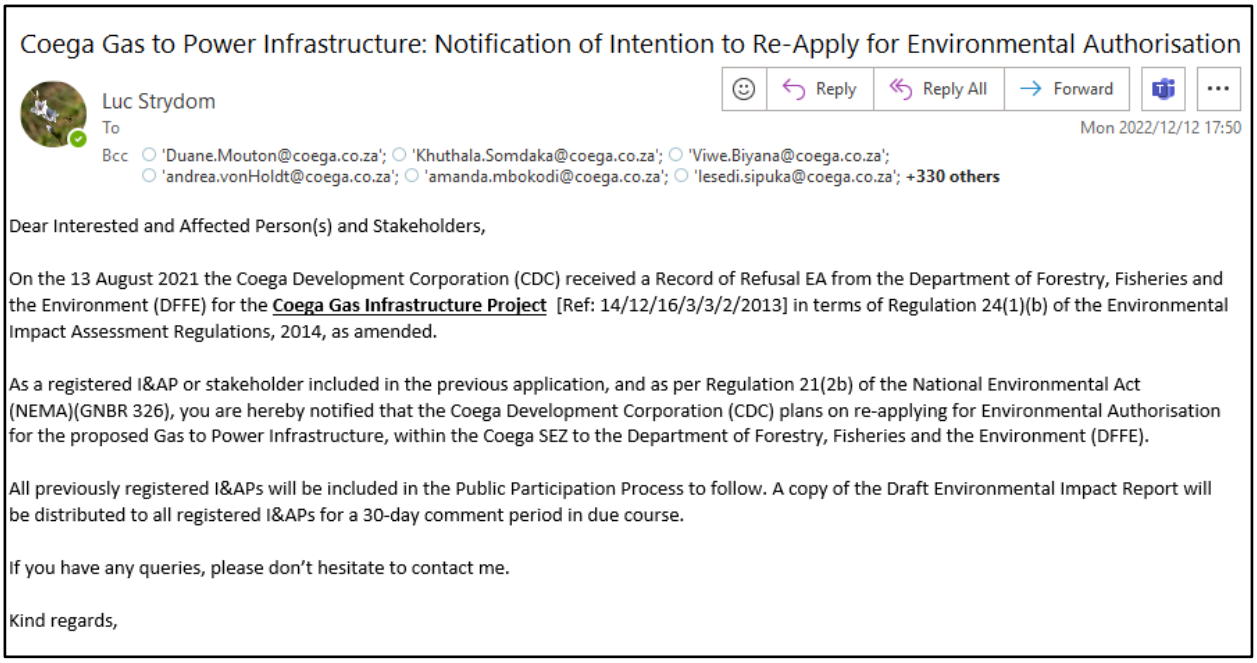
The Coega Development Corporation is located in the peri-urban area with restricted access and, in the past, DFFE has allowed placement of a poster on an electronic site notice board to accommodate for this factor. An electronic site notice on the electronic notice board was, therefore, placed in the CDC Office Foyer to inform and notify I&APs and stakeholders of the proposed project.

INSERT PHOTO OF ELETRONIC SIGNAGE ONCE PROIVDED*

12.4 INITIAL NOTIFICATION

Initial Notification was circulated as part of an informal PPP process. All stakeholders were sent a BID and I&APs were invited to register to be part of the I&AP Database. This, combined with a newspaper advert and the electronic site notification served as a gathering of I&APs for the project.

All documentation from the formal PPP process, which starts with the submission of the Application for Environmental Authorisation, will be included in Appendix A as part of the process.



Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Luc Strydom

Reply | Reply All | Forward

To

Mon 2022/12/12 17:50

Bcc 'Duane.Mouton@coega.co.za'; 'Khuthala.Somdaka@coega.co.za'; 'Viwe.Biyana@coega.co.za'; 'andrea.vonHoldt@coega.co.za'; 'amanda.mbokodi@coega.co.za'; 'lesedi.sipuka@coega.co.za'; **+330 others**

Dear Interested and Affected Person(s) and Stakeholders,

On the 13 August 2021 the Coega Development Corporation (CDC) received a Record of Refusal EA from the Department of Forestry, Fisheries and the Environment (DFFE) for the **Coega Gas Infrastructure Project** [Ref: 14/12/16/3/3/2/2013] in terms of Regulation 24(1)(b) of the Environmental Impact Assessment Regulations, 2014, as amended.

As a registered I&AP or stakeholder included in the previous application, and as per Regulation 21(2b) of the National Environmental Act (NEMA)(GNBR 326), you are hereby notified that the Coega Development Corporation (CDC) plans on re-applying for Environmental Authorisation for the proposed Gas to Power Infrastructure, within the Coega SEZ to the Department of Forestry, Fisheries and the Environment (DFFE).

All previously registered I&APs will be included in the Public Participation Process to follow. A copy of the Draft Environmental Impact Report will be distributed to all registered I&APs for a 30-day comment period in due course.

If you have any queries, please don't hesitate to contact me.

Kind regards,

12.5 SCOPING DECISION NOTIFICATION

Please find proof of the notification of the decision of the Scoping Phase here. The Final Scoping Report was approved on 06/01/2021, DFFE Reference: 14/12/16/3/3/1/2013.

environment, forestry & fisheries
Department:
Environment, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

Private Bag X 447· PRETORIA 0001· Environment House 473 Steve Biko Road, Arcadia· PRETORIA

DEFF Reference: 14/12/16/3/3/2/2013
Enquiries: Mmamohale Kabasa
Telephone: (012) 310 9420 **E-mail:** MKabasa@environment.gov.za

Ms Nicola Rump
SRK Consulting (South Africa) (Pty) Ltd
PO Box 21842
PORT ELIZABETH
6000

Telephone Number: (041) 509 4800
Email Address: nrump@srk.co.za

PER MAIL / E-MAIL

Dear Ms Rump

ACCEPTANCE OF THE SCOPING REPORT FOR THE LIQUEFIED NATURAL GAS (LNG) TERMINAL, GAS PIPELINES AND DISTRIBUTION HUB FOR THE TRANSMISSION, DISTRIBUTION AND RETICULATION OF NATURAL GAS WITHIN THE COEGA SEZ AND PORT OF NGQURA WITHIN THE NELSON MANDELA BAY MUNICIPALITY IN THE EASTERN CAPE PROVINCE

The Application for Environmental Authorisation and Draft Scoping Report (SR) received by the Department on 09 October 2020, the comments on the draft SR dated 05 November 2020, the final Scoping Report (SR) and the Plan of Study for Environmental Impact Assessment dated November 2020 and received by the Department on 23 November 2020, refer.

The Department has evaluated the submitted final SR and the Plan of Study for Environmental Impact Assessment dated September 2019 and is satisfied that the documents comply with the minimum requirements of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended. The Final SR is hereby accepted by the Department in terms of Regulation 22(1)(a) of the EIA Regulations, 2014, as amended.

You may proceed with the environmental impact assessment process in accordance with the tasks contemplated in the Plan of Study for Environmental Impact Assessment as required in terms of the EIA Regulations, 2014, as amended.

In addition, the following amendments and additional information are required for the EIAr:

(a) Listed Activities

(i) The EIAr must provide an assessment of the impacts and mitigation measures for each of the listed activities applied for.
(ii) The listed activities represented in the EIAr and the application form must be the same and correct.
(iii) The EIAr must assess the correct sub listed activity for each listed activity applied for.
(iv) Listing Notice 1, Item 24 of the EIA Regulations 2014 (As amended) included in the application form is not applicable to this development and must be removed from the application form.

(b) Public Participation

(i) Please ensure that comments from all relevant stakeholders are submitted to the Department with the EIAr. This includes but is not limited to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism; the Department of Environment, Forestry and Fisheries: Climate Change; the provincial Department of Agriculture; SANRAL, TNPA, the Nelson Mandela Bay Metropolitan Municipality, the Department of Water and Sanitation (DWS), the South African Heritage Resources Agency (SAHRA), the Endangered Wildlife Trust (EWT), BirdLife SA, and the Department of Environment, Forestry and Fisheries: Directorate Biodiversity and Conservation.

(ii) Please ensure that all issues raised and comments received during the circulation of the draft SR and draft EIAr from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final EIAr. Proof of correspondence with the various stakeholders must be included in the final EIAr. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments.

(iii) A Comments and Response trail report (C&R) must be submitted with the final EIAr. The C&R report must incorporate all comments for this development. The C&R report must be a separate document from the main report and the format must be in the table format as indicated in Appendix 1 of this comments letter. Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as "noted" is not regarded as an adequate response to I&APs' comments.

(iv) Comments from I&APs must not be split and arranged into categories. Comments from each submission must be responded to individually.

(v) The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations, 2014, as amended.

(vi) The EAP is requested to contact the Department to make the necessary arrangements to conduct a site inspection prior to the submission of the final EIAr.

(c) Alternatives

(i) Please provide a description of each of the preferred alternative type and provide detailed motivation on why it is preferred.

(ii) The applicant must determine the need for decommissioning of lines. This information must inform whether there is a need to update the application form and/or to amend the terms of reference for the specialist studies.

(d) Layout & Sensitivity Maps

(i) The EIAr must provide coordinate points for the proposed development site (note that if the site has numerous bend points, at each bend point coordinates must be provided) as well as the start, middle and end point of all linear activities.

(ii) Please provide a layout map which indicates the following:
   a) Positions of the power island, steam turbine and generator, fuel storage tanks, water storage reservoir and tanks, water and gas supply pipelines;
   b) Permanent laydown area footprint;
   c) All supporting onsite infrastructure e.g. roads (existing and proposed);
   d) Substation(s) and/or transformer(s) sites including their entire footprint;
   e) Connection routes (including pylon positions) to the distribution/transmission network; and
   f) All existing infrastructure on the site.

(iii) Please provide an environmental sensitivity map which indicates the following:
   a) The location of sensitive environmental features on site e.g. Marine Protected Areas, CBAs, heritage sites, wetlands, drainage lines etc. that will be affected;
   b) Buffer areas; and,
   c) All "no-go" areas.

(iv) The above layout map must be overlain with the sensitivity map and a cumulative map which shows neighbouring energy developments and existing grid infrastructure.

(e) Specialist assessments

(i) 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 authorisation.

(ii) 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.

(iii) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons and were necessary, include further expertise advice.

(f) Cumulative Assessment

(i) As there are other similar Gas to Power plants proposed within a 30km radius of the proposed development site, a cumulative impact assessment must be conducted for all identified and assessed impacts which must be refined to indicate the following:
   a) Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e. hectares of cumulatively transformed land.
   b) Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.
   c) The cumulative impacts significance rating must also inform the need and desirability of the proposed development.
   d) A cumulative impact environmental statement on whether the proposed development must proceed.

(g) General

(i) The EIAr must provide the technical details for the proposed facility in a table format as well as their description and/or dimensions.

(ii) The EAP must provide landowner consent for all farm portions affected by the proposed project, whether the project component is linear or not, i.e. all farm portions where the access road, facility and associated infrastructure is to be located.

(iii) A construction and operational phase EMPr that includes mitigation and monitoring measures must be submitted with the final EIAr.

The applicant is hereby reminded to comply with the requirements of Regulation 45 of GN R982 of 04 December 2014, as amendment, with regard to the time period allowed for complying with the requirements of the Regulations.

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.

Yours faithfully

Mr Sabelo Malaza
Chief Director: Integrated Environmental Authorisations
Department of Environment, Forestry and Fisheries
Signed by: Mr Coenrad Agenbach
Designation: Deputy Director: Priority Infrastructure Projects
Date: 06/01/2021

cc:	Themba Koza	The Coega Development Corporation	Email: themba.koza@coega.co.za

Annexure 1

Format for Comments and Response Trail Report:

Date of comment, format of comment, name of organisation/I&AP	Comment	Response from EAP/Applicant/Specialist
27/01/2016 Email Department of Environment, Forestry and Fisheries: Priority Infrastructure Projects (John Doe)	Please record C&R trail report in this format Please update the contact details of the provincial environmental authority	EAP: (~~Noted~~)The C&R trail report has been updated into the desired format, see Appendix K EAP: Details of provincial authority have been updated, see page 16 of the Application form

12.6 DRAFT EIR NOTIFICATION

All proofs of the notification of the submission of the Draft EIR will be provided in the final EIR.

12.7 FINAL EIR NOTIFICATION

The Final EIR will be placed on the CES website and all Stakeholders and I&APs will be made aware of the documentation for their reading.

12.8 PPP DATABASE

12.8.1 STAKEHOLDER DATABASE

Company	Capacity	Name	Email
DFFE		Babalwa Layini	BLayini@dffe.gov.za
DEDEAT: Coastal Zone Management (Cacadu Region)	Coastal Zone Management (Cacadu Region)	Sibulele Nondoda	sibulele.nondoda@dedea.gov.za
DFFE	Air Quality	Avhantodi Munyai	AMunyai@dffe.gov.za
DFFE	Strategic Infrastructure Development	Coenrad Agenbach	Cagenbach@dffe.gov.za
DFFE	Climate change monitoring and evaluation	Jongikhaya Witi	JWiti@dffe.gov.za
DFFE	Air Quality	Lerato Moja	lmoja@envronment.gov.za
DFFE	Climate change mitigation	Mactavish Makwarela	MAMakwarela@dffe.gov.za
DFFE	Climate change mitigation	Mapula Tshangela	MTshangela@dffe.gov.za
DFFE	Environmental Impact Management	Masina Morudu (Litsoane)	mlitsoane@dffe.gov.za
DFFE	Director: Strategic Infrastructure Development	Milicent Solomons	MSolomons@dffe.gov.za
DFFE	Assistant Director – Priority Infrastructure Projects	Muhammad Essop	MEssop@dffe.gov.za
DFFE	Air Quality	Olebogeng Matshediso	OMatshediso@dffe.gov.za
DFFE	Environmental Impact Management	Phumeza Skepe	pskepe@dffe.gov.za
DFFE	Climate change adaptation	Sibonele Mbanjwa	SMbanjwa@dffe.gov.za
DFFE	Biodiversity	Stanley Tshitwamulomoni	StanleyT@dffe.gov.za
DFFE	Air Quality Manager	Thuli Mdluli	tnmdluli@dffe.gov.za
DFFE		Ms Thoko Buthelezi	thokob@dffe.gov.za
DFFE		Ms Mashudu Marubini	MashuduMa@dffe.gov.za
DFFE	Air Quality	Vumile Senene	vsenene@dffe.gov.za

Company	Capacity	Name	Email
DFFE		Ms Zamalanga Langa	zlanga@dffe.gov.za
DFFE Biodiversity Conservation Unit (BCU)		Portia Makitla	pmakitla@dffe.gov.za
DFFE Biodiversity Conservation Unit (BCU)		Thobekile Zungu	tzungu@dffe.gov.za
DFFE: Biodiversity Mainstreaming EIA		Tsholofelo Shalot Sekonko	tsekonko@dffe.gov.za
DFFE: Biodiversity Mainstreaming EIA		Mmatla Rabothata	MRabothata@dffe.gov.za
DFFE: Biodiversity Mainstreaming EIA		Biodiversity Conservation	BCAdmin@dffe.gov.za
DFFE Directorate: Sustainable Aquaculture Management Environmental Officer: Shellfish Production		Michelle Pretorius	MPretorius@dffe.gov.za
DFFE Directorate: Sustainable Aquaculture Management		Fatima Daya	FDaya@dffe.gov.za
DFFE Directorate: Sustainable Aquaculture Management		Kishan Sankar	KSankar@dffe.gov.za
DFFE Directorate: Sustainable Aquaculture Management		Maxhoba Jezile	MJezile@dffe.gov.za
South African Environment Observation Network (SAEON)		Angelique Brooksbank	angelique@saeon.ac.za
Department of Environmental Affairs: Biodiversity & Conservation		Mr Shonisani Munzhedzi	smunzhedzi@dffe.gov.za
Department of Environmental Affairs:		Mr Simon Malete	smalete@dffe.gov.za

Company	Capacity	Name	Email
Biodiversity & Conservation			
Department of Economic Development, Environmental Affairs and Tourism		Mr Siyabonga Gqalangile	siyanbonga.gqalangile@dedea.gov.za
Department of Economic Development, Environmental Affairs and Tourism		Mr Alistair McMaster	Alistair.McMaster@dedea.gov.za
Department of Water & Sanitation (DWS) (Eastern Cape)		Ms Marisa Bloem	BloemM@dws.gov.za
Department of Water & Sanitation (DWS) (Eastern Cape)		Mr Thabo Nokoyo	NokoyoT@dwa.gov.za
Department of Mineral Resources (DMR) (Eastern Cape)		Ms Brenda Ngebulana	Brenda.Ngebulana@dmre.gov.za
Department of Mineral Resources (DMR) (Eastern Cape)		Ms Zimkita Tyala	Zimkita.Tyala@dmre.gov.za
DEDEAT: Coastal Zone Management		Ricky Hannan	Ricky.Hannan@dedea.gov.za
DEDEAT: Coastal Zone Management		Loyiso Nondlebe	loyiso.nondlebe@dedea.gov.za
DEDEAT: Coastal Zone Management		Leight-Anne Kretzman	Leigh-ann.Kretzmann@dedea.gov.za
DEDEAT Sarah Baartman District	Regional Director	Leon Els	leon.els@dedea.gov.za
DEDEAT Sarah Baartman District	Assistant Manager: Administration	Dante Rademeyer	dante.rademeyer@dedea.gov.za
DEDEAT Sarah Baartman District	Regional Manager: Environmental Affairs	Dayalan Govender	dayalan.govender@dedea.gov.za
DEDEAT Sarah Baartman District	Regional Manager: Economic Development	Mlungiseleli Kosi	mlungiseleli.losi@dedea.gov.za

Company	Capacity	Name	Email
EC DEDEAT	Head of Department	Mickey Mama	mickey.mama@dedea.gov.za
DFFE:Oceans & Coast	Deputy Director General	Monde Mayekiso	mmayekiso@dffe.gov.za
DFFE:Oceans & Coast	Pollution Manager	Mulalo Tshikotshi	mtshikot@dffe.gov.za
DFFE:Oceans & Coast	Coastal Pollution Management Division	Nitasha Baijnath-Pillay	nbpillay@dffe.gov.za
WESSA		Mike Denison	Mike.Denison@wessa.co.za
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12.8.2 LANDOWNER DATABASE

The Applicant is the landowner for majority of the proposed Gas Infrastructure footprint. However, Port of Ngqura – Transnet National Ports Authority owns a portion of land which a section of gas infrastructure will intersect. A letter was submitted with the Environmental Application (Appendix 3) from TNPA confirming consent for the EIA.

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12.8.3 SURROUNDING LANDOWNER DATABASE

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12.8.4 REGISTERED I&AP DATABASE

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12.9 ISSUES & RESPONSE TRAIL

The Issues & Response Trail (IRT) can be found in Appendix H of this document as a separate standalone chapter. The IRT includes all issues raised includes the EAP responses to these issues. These tables will be updated throughout the process from inception until submission of the Final EIR to the Competent Authority (DFFE).

12.10 PPP PROOFS

The following documents include all PPP proofs as per this section. Full reports and comments from I&APs are available in Appendix I of this report.

13 APPENDIX B: LAYOUT DRAWINGS

14 APPENDIX C: FULL IMPACTS TABLES

15 APPENDIX D: SPECIALIST REPORTS

16 APPENDIX E: SPECIALIST DECLARATIONS

17 APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMMES (EMPRS): GENERIC AND APPENDIX 4

18 APPENDIX G: ISSUES & RESPONSE REPORT

**** Please note that this table has be updated throughout the EIA Processes. Comments are captured in chronological order, with the oldest comment at the top of the table and the newest comment at the bottom of the table.***

I&AP, Stakeholder or Neighboring Landowner	Comment	Response
12 November 2022 Mike Oberholzer Quantitative Risk Specialist RISCOM	(Response to CES email right) In doing the QRA, I was given specific layouts to use as well as specific process parameters. The risk assessment would be valid, providing there is no change to the original scope. Thus, any change to the original scope will invalidate the report. This email is without prejudice.	Dear Mr Oberholzer I hope this email finds you well. CES have been appointed by Coega Development Corporation (Pty) Ltd to submit an Application for Environmental Authorisation (EA) for the development of the CDC Gas to Power Infrastructure with associated gas infrastructure components within the Coega SEZ and PON, Nelson Mandela Metropolitan Municipality. A previous EA Application was submitted in 2020 for this project, and the scoping report approved in 2021, however the EIR and EA was ultimately rejected by DFFE in August 2021. CES has since been appointed to review and update the EIR (specific to the Gas to Power infrastructure component and not including the Power Generating Plants) for reapplication and would like to request confirmation that the Quantitative Risk Assessment of importation and distribution of LNG into Coega report (attached) by Riscom (Pty) Ltd that you submitted is still valid and no significant changes to the baseline or impact ratings are anticipated?
14 November 2022 Mark Zunckel Atmospheric Impact Specialist uMoya-Nilu Consulting	(Response to CES email right) Thanks for the email. As long as the proposed gas infrastructure project is the same then the air quality impact report that uMoya-NILU submitted is still valid and I don't believe that there are any no significant changes required to the baseline, and that the impact ratings will remain the same.	Dear Mr Zunckel CES have been appointed by Coega Development Corporation (Pty) Ltd to submit an Application for Environmental Authorisation (EA) for the development of the CDC Gas to Power Infrastructure with associated gas infrastructure components within the Coega SEZ and PON, Nelson Mandela

		Metropolitan Municipality. A previous EA Application was submitted in 2020 for this project, and the scoping report approved in 2021, however the EIR and EA was ultimately rejected by DFFE in August 2021. CES has since been appointed to review and update the EIR (specific to the Gas to Power infrastructure component and not including the Power Generating Plants) for reapplication and would like to request confirmation that the Atmospheric Impact Report (attached) from uMoya-Nilu Consulting (Pty) Ltd that you submitted is still valid and no significant changes to the baseline or impact ratings are anticipated?
14 November 2022 Dr Brett Williams Noise Impact Specialist Safetech	(Response to CES email right) If the scope of the project has not changed at all then the report should be ok. Why was the EA rejected as this may mean our report needs to be updated?	Dear Dr Williams. I hope this email finds you well. CES have been appointed by Coega Development Corporation (Pty) Ltd to submit an Application for Environmental Authorisation (EA) for the development of the CDC Gas to Power Infrastructure with associated gas infrastructure components within the Coega SEZ and PON, Nelson Mandela Metropolitan Municipality. A previous EA Application was submitted in 2020 for this project, and the scoping report approved in 2021, however the EIR and EA was ultimately rejected by DFFE in August 2021. CES has since been appointed to review and update the EIR (specific to the Gas to Power infrastructure component and not including the Power Generating Plants) for reapplication and would like to request confirmation that the Noise Impact Assessment report by Safetech (Pty) Ltd (attached) that you submitted is still valid and no significant changes to the baseline or impact ratings are anticipated?

	If the scope of the project has not changed at all then the report should be ok. Why was the EA rejected as this may mean our report needs to be updated? Based on the information below the report from a human noise impact perspective is still valid.	Thanks a lot. The EA was rejected because of an issue with land owner consent during the operational phase, as well as the lack of a report on the impacts to the Damara terns (which has subsequently been conducted by Acoustech and Dr Paul Martin). There has not been any change in the scope and the Final Scoping Report is still valid. We are of the opinion that your report is still valid, and does not require updating and hence why we are asking for confirmation.
12 December 2022 Ryan David-Anderson Permitting Manager Mulilo Renewable Project Developments (Pty) Ltd	Legend thanks Luc!	CES acknowledged the receipt of notification from the I&AP.
13 December 2022 Dr Ian Little Endangered Wildlife Trust	Please retain us as I&APs.	Endangered Wildlife Trust were retained as I&APs.
15 December 2022 Briege Williams SAHRIS	Thank you for the email regarding the above project. If the re-application will be under the same reference number (14/12/16/3/3/2/2013) then the new DEIR must be uploaded onto the existing case on SAHIRS (case ID 16279) and the case status changed to SUBMITTED. If the application will have a new reference number then a new case must be created on SAHRIS and all the relevant documents uploaded for review.	A new case will be created on SAHRIS and all relevant documents will be uploaded for review.
15 December 2022 Jennifer Gon Intekom	Please can you remove me from this mailing list and from the CES list of I&APs.	Jennifer Gon was removed as an I&AP.

16 December 2022 Christina Hagen Birdlife South Africa	Please can you add Birdlife South Africa to your list of I&Aps for the Coega gas to power project? Please include my email address and advocacy@birdlife.org.za	The I&APs were registered and added to the database.
11 January 2023 EIA Applications Integrated Environmental Authorisations DFFE	14/12/16/3/3/2/2265 ACKNOWLEDGEMENT OF RECEIPT OF THE NEW APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOLLOWING A SCOPING ASSESSMENT PROCESS FOR THE PROPOSED COEGA DEVELOPMENT CORPORATION (CDC) GAS TO POWER PROJECT PROPOSED GAS INFRASTRUCTURE, EASTERN CAPE PROVINCE. The Department confirms having received the Application form for Environmental Authorisation for the abovementioned project on 06 January 2023. You have submitted these documents to comply with the Environmental Impact Assessment (EIA) Regulations, 2014, as amended. Kindly note that your application for Environmental Authorisation falls within the ambit of an application applied for in terms of Part 3 of Chapter 4 of the EIA Regulations, 2014, as amended. You are therefore referred to Regulation 21 of the EIA Regulations, 2014 as amended. Please take note of Regulation 40(3) of the EIA Regulations, 2014, as amended, which states that potential Interested & Affected Parties, including the Competent Authority, may be provided with an opportunity to comment on reports and plans contemplated in Regulation 40(1) of the EIA Regulations, 2014, as amended, prior to the submission of an application but must be provided an opportunity to comment on such	CES acknowledges the receipt of the application for environmental authorisation from DFFE.

	reports once an application has been submitted to the Competent Authority. Note that in terms of Regulation 45 of the EIA Regulations, 2014, as amended, this application will lapse if the applicant fails to meet any of the time-frames prescribed in terms of these Regulations, unless an extension has been granted by the Department in terms of Regulation 3(7) of the EIA Regulations, 2014, as amended. 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. Kindly quote the abovementioned reference number in any future correspondence in respect of the application.	
18 January 2023 Andrea von Holdt Environmental Manager CDC	Kindly ensure that Dr Schumann is on the IAP database for the EIA currently underway for CDC's proposed Gas to Power Infrastructure Project. <u>Details below</u>: Dr Eckart Schumann 53 Summerdunes Retirement Village Richardson Road, Summerstrand, Port Elizabeth Tel: 041 503 7864 - Cell: 083 299 2092	Noted. CES has added Dr Schumann as an I&AP onto the database.
	1. Could you kindly provide CDC with the list of registered IAPs, including email addresses for the Gas Infrastructure EIA? Are we able to share this list with ECA Consulting, appointed	Noted. CES has added Ms Friend to the database (see attached). You are welcome to share the database with the powerplant consultants.

	to conduct the EIAs for the 2 power stations? 2. Please add below to IAP database: Algoa Bay Conservation Ms Ronelle Friend Cell: 0836361156 ronelle@baymt.co.za	

19 APPENDIX H: COMMENTS AND REPORTS RECEIVED

Sage Wansell

From: mike@riscom.co.za
Sent: Saturday, November 12, 2022 12:39 PM
To: Sage Wansell
Cc: Luc Strydom
Subject: RE: Quantitative Risk Assessment for Coega CDC Gas to Power Infrastructure project (report number R/20/SRK-01 Rev 2, March 2021)

Dear Sage,

Thank you for your enquiry.

In doing the QRA, I was given specific layouts to use as well as specific process parameters. The risk assessment would be valid, providing there is no change to the original scope. Thus, any change to the original scope will invalidate the report.

This email is without prejudice.

Regards,

Mike Oberholzer
Pr. Eng. BSc (Chem. Eng.) MSAIChE MIChemE
Managing Director

RISCOM®

mike@riscom.co.za
www.riscom.co.za

Tel: +27 (0) 11 431 2198
Cell: +27 (0) 82 457 3258
Fax: +27 (0) 86 624 9423

P O Box 2541
Cresta, 2118

From: Sage Wansell <Sage.Wansell@cesnet.co.za>
Sent: 11 November 2022 15:21
To: mike@riscom.co.za
Cc: Luc Strydom <Luc.Strydom@cesnet.co.za>
Subject: Quantitative Risk Assessment for Coega CDC Gas to Power Infrastructure project (report number R/20/SRK-01 Rev 2, March 2021)

Dear Mr Oberholzer

I hope this email finds you well. CES have been appointed by Coega Development Corporation (Pty) Ltd to submit an Application for Environmental Authorisation (EA) for the development of the CDC Gas to Power Infrastructure with associated gas infrastructure components within the Coega SEZ and PON, Nelson Mandela Metropolitan Municipality. A previous EA Application was submitted in 2020 for this project, and the scoping report approved in 2021, however the EIR and EA was ultimately rejected by DFFE in August 2021.

CES has since been appointed to review and update the EIR (specific to the Gas to Power infrastructure component and not including the Power Generating Plants) for reapplication and would like to request confirmation that the Quantitative

Risk Assessment of importation and distribution of LNG into Coega report (attached) by Riscom (Pty) Ltd that you submitted is still valid and no significant changes to the baseline or impact ratings are anticipated?

Thank you for your time,

Sage

NEXTEC

SAGE WANSELL
ENVIRONMENTAL CONSULTANT
CES – ENVIRONMENTAL AND
SOCIAL ADVISORY SERVICES

T +27875491645
Sage.Wansell@cesnet.co.za

Sage Wansell

From: Mark Zunckel <Mark@umoya-nilu.co.za>
Sent: Monday, November 14, 2022 2:35 PM
To: Sage Wansell
Cc: Luc Strydom
Subject: RE: Atmospheric Impact Report for CDC Gas to Power Infrastructure Project (report number uMN101-2020, February 2021)

Hi Sage

Thanks for the email. As long as the proposed gas infrastructure project is the same then the air quality impact report that uMoya-NILU submitted is still valid and I don't believe that there are any no significant changes required to the baseline, and that the impact ratings will remain the same.

Regards, Mark

From: Sage Wansell <Sage.Wansell@cesnet.co.za>
Sent: Friday, 11 November 2022 15:17
To: mark@umoya-nilu.co.za
Cc: Luc Strydom <Luc.Strydom@cesnet.co.za>
Subject: Atmospheric Impact Report for CDC Gas to Power Infrastructure Project (report number uMN101-2020, February 2021)

Dear Mr Zunckel

I hope this email finds you well. CES have been appointed by Coega Development Corporation (Pty) Ltd to submit an Application for Environmental Authorisation (EA) for the development of the CDC Gas to Power Infrastructure with associated gas infrastructure components within the Coega SEZ and PON, Nelson Mandela Metropolitan Municipality. A previous EA Application was submitted in 2020 for this project, and the scoping report approved in 2021, however the EIR and EA was ultimately rejected by DFFE in August 2021.

CES has since been appointed to review and update the EIR (specific to the Gas to Power infrastructure component and not including the Power Generating Plants) for reapplication and would like to request confirmation that the Atmospheric Impact Report (attached) from uMoya-Nilu Consulting (Pty) Ltd that you submitted is still valid and no significant changes to the baseline or impact ratings are anticipated?

Thank you for your time,

Warm regards

Sage

Sage Wansell

From: Dr Brett Williams <Brett.Williams@safetech.co.za>
Sent: Monday, November 14, 2022 10:30 AM
To: Luc Strydom; Sage Wansell; Jason Hutten
Subject: Re: Noise Impact Assessment report for Coega CDC Gas to Power Infrastructure project (report no. P7142)

Hi Luc

Based on the information below the report from a human noise impact perspective is still valid.

Regards

Brett

Dr Brett Williams
Mobile: +27 (0)82 5502137
Tel: +27 41 3656846

From: Luc Strydom <Luc.Strydom@cesnet.co.za>
Date: Monday, 14 November 2022 at 10:26
To: Dr Brett Williams <Brett.Williams@safetech.co.za>, Sage Wansell <Sage.Wansell@cesnet.co.za>, Jason Hutten <jason.hutten@safetech.co.za>
Subject: RE: Noise Impact Assessment report for Coega CDC Gas to Power Infrastructure project (report no. P7142)

Hi Brett,

Thanks a lot. The EA was rejected because of an issue with land owner consent during the operational phase, as well as the lack of a report on the impacts to the Damara terns (which has subsequently been conducted by Acoustech and Dr Paul Martin). There has not been any change in the scope and the Final Scoping Report is still valid.

We are of the opinion that your report is still valid, and does not require updating and hence why we are asking for confirmation.

Kind regards,

NEXTEC

LUC STRYDOM
PRINCIPAL ENVIRONMENTAL CONSULTANT
CES – ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

T +27874057499
Luc.Strydom@cesnet.co.za

From: Dr Brett Williams <Brett.Williams@safetech.co.za>
Sent: Monday, 14 November 2022 10:17
To: Sage Wansell <Sage.Wansell@cesnet.co.za>; Jason Hutten <jason.hutten@safetech.co.za>
Cc: Luc Strydom <Luc.Strydom@cesnet.co.za>
Subject: Re: Noise Impact Assessment report for Coega CDC Gas to Power Infrastructure project (report no. P7142)

Hi sage

If the scope of the project has not changed at all then the report should be ok. Why was the EA rejected as this may mean our report needs to be updated?

Regards

Brett

Dr Brett Williams
Mobile: +27 (0)82 5502137
Tel: +27 41 3656846

From: Sage Wansell <Sage.Wansell@cesnet.co.za>
Date: Friday, 11 November 2022 at 15:43
To: Dr Brett Williams <Brett.Williams@safetech.co.za>
Cc: Luc Strydom <Luc.Strydom@cesnet.co.za>
Subject: Noise Impact Assessment report for Coega CDC Gas to Power Infrastructure project (report no. P7142)

Dear Dr Williams

I hope this email finds you well. CES have been appointed by Coega Development Corporation (Pty) Ltd to submit an Application for Environmental Authorisation (EA) for the development of the CDC Gas to Power Infrastructure with associated gas infrastructure components within the Coega SEZ and PON, Nelson Mandela Metropolitan Municipality. A previous EA Application was submitted in 2020 for this project, and the scoping report approved in 2021, however the EIR and EA was ultimately rejected by DFFE in August 2021.

CES has since been appointed to review and update the EIR (specific to the Gas to Power infrastructure component and not including the Power Generating Plants) for reapplication and would like to request confirmation that the Noise Impact Assessment report by Safetech (Pty) Ltd (attached) that you submitted is still valid and no significant changes to the baseline or impact ratings are anticipated?

Thank you for your time,

Sage

NEXTEC
SAGE WANSELL
ENVIRONMENTAL CONSULTANT
CES – ENVIRONMENTAL AND
SOCIAL ADVISORY SERVICES

2

Sage Wansell

From: Ryan David-Andersen <ryan@mulilo.com>
Sent: Monday, December 12, 2022 6:04 PM
To: Luc Strydom
Subject: Re: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Legend thanks Luc!!

Ryan David-Andersen
Permitting Manager
Mulilo Renewable Project Developments (Pty) Ltd
Tel: +27 72 678 1523 Email: ryan@mulilo.com
Physical: Top Floor Golf Park 4 Raapenberg Rd Mowbray 7700
Postal: PostNet Suite #53 Private Bag X21 Howard Place 7450

From: Luc Strydom <Luc.Strydom@cesnet.co.za>
Sent: Monday, 12 December 2022 17:50
Subject: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Dear Interested and Affected Person(s) and Stakeholders,

On the 13 August 2021 the Coega Development Corporation (CDC) received a Record of Refusal EA from the Department of Forestry, Fisheries and the Environment (DFFE) for the **Coega Gas Infrastructure Project** [Ref: 14/12/16/3/3/2/2013] in terms of Regulation 24(1)(b) of the Environmental Impact Assessment Regulations, 2014, as amended.

As a registered I&AP or stakeholder included in the previous application, and as per Regulation 21(2b) of the National Environmental Act (NEMA)(GNBR 326), you are hereby notified that the Coega Development Corporation (CDC) plans on re-applying for Environmental Authorisation for the proposed Gas to Power Infrastructure, within the Coega SEZ to the Department of Forestry, Fisheries and the Environment (DFFE).

All previously registered I&APs will be included in the Public Participation Process to follow. A copy of the Draft Environmental Impact Report will be distributed to all registered I&APs for a 30-day comment period in due course.

If you have any queries, please don't hesitate to contact me.

Kind regards,

NEXTEC
LUC STRYDOM
PRINCIPAL ENVIRONMENTAL CONSULTANT
CES – ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

1

Sage Wansell

From: Ian Little <ianl@ewt.org.za>
Sent: Tuesday, December 13, 2022 9:13 AM
To: Luc Strydom
Subject: FW: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Dear Luc

Please retain us an I&AP.

Thank you,

Dr. Ian T. Little

Head of Conservation | Endangered Wildlife Trust
W + 27 21 799 8460 | F + 27 11 608 4682 | C + 27 84 240 7341

Email: ianl@ewt.org.za | Web: www.ewt.org.za | Skype: ian.tchagra.little

Broad-Based Black Economic Empowerment – BBBEE Level 4 Certificate & 95% Civil Society Organisation
PBO number: 930 001 777
NPO number: 015-502 NPO
IT number: IT 6247

Physical Address: 27 and 28 Austin Road, Glen Austin AH, Midrand, 1685, Gauteng, South Africa
Postnet Suite # 027, Postnet Suite 002, Private Bag X08, Wierda Park 0149, Gauteng, South Africa

"We all have one universal and inherent commonality and that is the turmoil and joy of being human." (Bryan Little, 2012)

From: Kerryn Morrison <kerrynm@ewt.org.za>
Sent: Monday, 12 December 2022 19:57
To: EWT EIA Applications <eia@ewt.org.za>; Ian Little <ianl@ewt.org.za>; Ashleigh Dore <ashleighd@ewt.org.za>
Subject: FW: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Sage Wansell

From: Briege Williams <bwilliams@sahra.org.za>
Sent: Wednesday, December 14, 2022 2:15 PM
To: Luc Strydom
Subject: RE: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Luc

Thank you for the email regarding the above project. If the re-application will be under the same reference number (14/12/16/3/3/2/2013) then the new DEIR must be uploaded onto the existing case on SAHIRS (case ID 16279) and the case status changed to SUBMITTED. If the application will have a new reference number then a new case must be created on SAHRIS and all the relevant documents uploaded for review.

Kind regards

Briege

From: Luc Strydom <Luc.Strydom@cesnet.co.za>
Sent: Monday, 12 December 2022 17:50
Subject: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Dear Interested and Affected Person(s) and Stakeholders,

On the 13 August 2021 the Coega Development Corporation (CDC) received a Record of Refusal EA from the Department of Forestry, Fisheries and the Environment (DFFE) for the Coega Gas Infrastructure Project [Ref: 14/12/16/3/3/2/2013] in terms of Regulation 24(1)(b) of the Environmental Impact Assessment Regulations, 2014, as amended.

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All previously registered I&APs will be included in the Public Participation Process to follow. A copy of the Draft Environmental Impact Report will be distributed to all registered I&APs for a 30-day comment period in due course.

If you have any queries, please don't hesitate to contact me.

Kind regards,

NEXTEC

LUC STRYDOM
PRINCIPAL ENVIRONMENTAL CONSULTANT

1

CES – ENVIRONMENTAL AND
SOCIAL ADVISORY SERVICES

T +27874057499
Luc.Strydom@cesnet.co.za

Briege Williams
Heritage Officer: Maritime and Underwater
Cultural Heritage Unit

T: 021 462 4502/ 8688
M:
E: BWilliams@sahra.org.za
A: SAHRA, 111 Harrington Street, Cape Town, 8001,
Western Cape, ZA
www.sahra.org.za

Sage Wansell

From: Jenny Gon <j-gon@intekom.co.za>
Sent: Wednesday, December 14, 2022 5:45 PM
To: Luc Strydom
Subject: RE: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Luc
Please can you remove me from this mailing list and from the CES list of IAPs.
Many thanks
Jennifer Gon

From: Luc Strydom [mailto:Luc.Strydom@cesnet.co.za]
Sent: Monday, December 12, 2022 5:50 PM
To: Undisclosed@zmmtain1.telkomsa.net; "recipients:"@zmmtain1.telkomsa.net
Subject: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Dear Interested and Affected Person(s) and Stakeholders,

On the 13 August 2021 the Coega Development Corporation (CDC) received a Record of Refusal EA from the Department of Forestry, Fisheries and the Environment (DFFE) for the Coega Gas Infrastructure Project [Ref: 14/12/16/3/3/2/2013] in terms of Regulation 24(1)(b) of the Environmental Impact Assessment Regulations, 2014, as amended.

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All previously registered I&APs will be included in the Public Participation Process to follow. A copy of the Draft Environmental Impact Report will be distributed to all registered I&APs for a 30-day comment period in due course.

If you have any queries, please don't hesitate to contact me.

Kind regards,

NEXTEC

LUC STRYDOM
PRINCIPAL ENVIRONMENTAL CONSULTANT
CES – ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

T +27874057499
Luc.Strydom@cesnet.co.za

Sage Wansell

From: Christina Hagen <christina.hagen@birdlife.org.za>
Sent: Thursday, December 15, 2022 2:03 PM
To: Luc Strydom
Subject: Coega Gas to Power Infrastructure

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Luc

Please can you add BirdLife South Africa to your list of I&APs for the Coega gas to power project?

Please include my email address and advocacy@birdlife.org.za

Many thanks
Christina

Christina Hagen
Pamela Isdell Fellow of Penguin Conservation

BirdLife SOUTH AFRICA

Centre for Biodiversity Conservation, Kirstenbosch Botanical Gardens, Newlands 7700, Cape Town
P.O. Box 7119, Roggebaai 8012, Cape Town, South Africa
Cell: +27 (0)83 301 8765
E-mail: christina.hagen@birdlife.org.za
http://www.birdlife.org.za

1

Sage Wansell

From: Ephron Maradwa <EMaradwa@dffe.gov.za>
Sent: Wednesday, January 11, 2023 11:44 AM
To: Luc Strydom
Cc: Mmamohale Kabasa; EIAadmin; Salome Mambane
Subject: 14/12/16/3/3/2/2265

Dear Luc

14/12/16/3/3/2/2265

ACKNOWLEDGEMENT OF RECEIPT OF THE NEW APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOLLOWING A SCOPING ASSESSMENT PROCESS FOR THE PROPOSED COEGA DEVELOPMENT CORPORATION (CDC) GAS TO POWER PROJECT PROPOSED GAS INFRASTRUCTURE, EASTERN CAPE PROVINCE.

The Department confirms having received the Application form for Environmental Authorisation for the abovementioned project on 06 January 2023. You have submitted these documents to comply with the Environmental Impact Assessment (EIA) Regulations, 2014, as amended.

Kindly note that your application for Environmental Authorisation falls within the ambit of an application applied for in terms of Part 3 of Chapter 4 of the EIA Regulations, 2014, as amended. You are therefore referred to Regulation 21 of the EIA Regulations, 2014 as amended.

Please take note of Regulation 40(3) of the EIA Regulations, 2014, as amended, which states that potential Interested & Affected Parties, including the Competent Authority, may be provided with an opportunity to comment on reports and plans contemplated in Regulation 40(1) of the EIA Regulations, 2014, as amended, prior to the submission of an application but must be provided an opportunity to comment on such reports once an application has been submitted to the Competent Authority.

Note that in terms of Regulation 45 of the EIA Regulations, 2014, as amended, this application will lapse if the applicant fails to meet any of the time-frames prescribed in terms of these Regulations, unless an extension has been granted by the Department in terms of Regulation 3(7) of the EIA Regulations, 2014, as amended.

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.

Kindly quote the abovementioned reference number in any future correspondence in respect of the application.

EIA Applications
Integrated Environmental Authorisations
Department of Forestry, Fisheries and the Environment

Please note that this email is for the receipt and processing of online applications only, and is not monitored for responses. All queries must be directed to EIAadmin@dffe.gov.za.

You are advised that this mailbox has a 48 hour response time.

Please note that this mailbox has a 5mb mail limit. No zip files are to be attached in any email.

forestry, fisheries & the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X 447· PRETORIA 0001· Environment House 473 Steve Biko Road, Arcadia· PRETORIA

DFFE Reference: 14/12/16/3/3/2/2265
Enquiries: Ms Mmamohale Kabasa
Telephone: (012) 399 9420 **E-mail:** MKabasa@dffe.gov.za

Mr Luc Strydom
CES Environmental & Social Advisory Services
29 Campbell Street
GQEBERHA
6001

Telephone Number: (083) 515 4702
Email Address: Luc.Strydom@cesnet.co.za

PER MAIL / EMAIL

Dear Mr Strydom

ACKNOWLEDGEMENT OF RECEIPT OF THE NEW APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOLLOWING A SCOPING ASSESSMENT PROCESS FOR THE PROPOSED COEGA DEVELOPMENT CORPORATION (CDC) GAS TO POWER PROJECT PROPOSED GAS INFRASTRUCTURE, EASTERN CAPE PROVINCE.

The Department confirms having received the Application form for Environmental Authorisation for the abovementioned project on 06 January 2023. You have submitted these documents to comply with the Environmental Impact Assessment (EIA) Regulations, 2014, as amended.

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Please take note of Regulation 40(3) of the EIA Regulations, 2014, as amended, which states that potential Interested & Affected Parties, including the Competent Authority, may be provided with an opportunity to comment on reports and plans contemplated in Regulation 40(1) of the EIA Regulations, 2014, as amended, prior to the submission of an application but **must** be provided an opportunity to comment on such reports once an application has been submitted to the Competent Authority.

Note that in terms of Regulation 45 of the EIA Regulations, 2014, as amended, this application will lapse if the applicant fails to meet any of the time-frames prescribed in terms of these Regulations, unless an extension has been granted by the Department in terms of Regulation 3(7) of the EIA Regulations, 2014, as amended.

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.

Kindly quote the abovementioned reference number in any future correspondence in respect of the application.

Yours sincerely

Mr Vusi Skosana
Acting Chief Director: Integrated Environmental Authorisations
Department of Forestry, Fisheries and the Environment
Letter signed by: Mr Muhammad Essop
Designation: Acting Director: Reporting and Sector Monitoring
Date: 19/01/2023

RE: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Luc Strydom <Luc.Strydom@cesnet.co.za>
Fri 1/27/2023 12:19 PM
To: Andrea von Holdt <Andrea.VonHoldt@coega.co.za>;Sage Wansell <Sage.Wansell@cesnet.co.za>

1 attachments (199 KB)
updated PPP database 26 Jan 2023 Coega CDC Gas to Power project.xlsx;

Hi Andrea,

Noted. We have added Ms Friend to the database (see attached). You are welcome to share the database with the powerplant consultants.

Kind regards,

LUC STRYDOM
PRINCIPAL ENVIRONMENTAL CONSULTANT
CES – ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES
NEXTEC

T +27874057499
Luc.Strydom@cesnet.co.za

From: Andrea von Holdt <Andrea.VonHoldt@coega.co.za>
Sent: Thursday, 26 January 2023 12:24
To: Luc Strydom <Luc.Strydom@cesnet.co.za>; Sage Wansell <Sage.Wansell@cesnet.co.za>
Subject: RE: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Dear Luc and Sage

1. Could you kindly provide CDC with the list of registered IAPs, including email addresses for the Gas Infrastructure EIA? Are we able to share this list with ECA Consulting, appointed to conduct the EIAs for the 2 power stations?

2. Please add below to IAP database:

   Algoa Bay Conservation
   Ms Ronelle Friend
   Cell: 0836361156
   ronelle@baymt.co.za

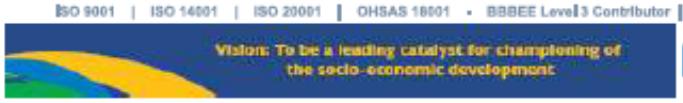
Sincerely,

Andrea von Holdt, MSc, PrSciNat

Environmental Manager – Sustainability Business Unit

Mobile: 082-657 4648
Office: 041-403 0664
Email: Andrea.vonholdt@coega.co.za
Website: www.coega.co.za

ISO 9001 | ISO 14001 | ISO 20001 | OHSAS 18001 • BBBEE Level 3 Contributor | EPWP Awards Recipient



From: Luc Strydom <Luc.Strydom@cesnet.co.za>
Sent: Monday, 12 December 2022 17:50
Subject: Coega Gas to Power Infrastructure: Notification of Intention to Re-Apply for Environmental Authorisation

Dear Interested and Affected Person(s) and Stakeholders,

On the 13 August 2021 the Coega Development Corporation (CDC) received a Record of Refusal EA from the Department of Forestry, Fisheries and the Environment (DFFE) for the **Coega Gas Infrastructure Project** [Ref: 14/12/16/3/3/2/2013] in terms of Regulation 24(1)(b) of the Environmental Impact Assessment Regulations, 2014, as amended.

As a registered I&AP or stakeholder included in the previous application, and as per Regulation 21(2b) of the National Environmental Act (NEMA)(GNBR 326), you are hereby notified that the Coega Development Corporation (CDC) plans on re-applying for Environmental Authorisation for the proposed Gas to Power Infrastructure, within the Coega SEZ to the Department of Forestry, Fisheries and the Environment (DFFE).

All previously registered I&APs will be included in the Public Participation Process to follow. A copy of the Draft Environmental Impact Report will be distributed to all registered I&APs for a 30-day comment period in due course.

If you have any queries, please don't hesitate to contact me.

Kind regards,

NEXTEC

LUC STRYDOM
PRINCIPAL ENVIRONMENTAL CONSULTANT
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Luc.Strydom@cesnet.co.za

20 APPENDIX I: CURRICULUM VITAE

- Dr Alan Carter
- Mr Luc Strydom
- Ms Sage Wansell