



ECC

ENVIRONMENTAL
COMPLIANCE CONSULTANCY



ECC-106-285-REP-09-D

ENVIRONMENTAL MANAGEMENT PLAN

**PILOT SUSTAINABLE WATER SUPPLY PROJECT BY MEANS OF DESALINATION,
POWERED BY SOLAR TO SUPPLEMENT WATER SUPPLY FOR WALVIS BAY, ERONGO
REGION, NAMIBIA**

PREPARED FOR



JULY 2020

TITLE AND APPROVAL PAGE

Project Name:	Pilot sustainable water supply project by means of desalination, powered by solar to supplement water supply for Walvis Bay, Erongo Region, Namibia.
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Environmental Compliance Consultancy Contact Details:

We welcome any enquiries regarding this document and its content. Please contact:

Stephan Bezuidenhout

Environmental Consultant & Practitioner

Tel: +264 81 699 7608

Email: stephan@eccenvironmental.com

www.eccenvironmental.com

Jessica Mooney

Environmental Consultant & Practitioner

Tel: +264 81 699 7608

Email: jessica@eccenvironmental.com

www.eccenvironmental.com

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TABLE OF CONTENTS

1	INTRODUCTION	6
1.1	PROJECT BACKGROUND	6
1.2	ENVIRONMENTAL REGULATORY REQUIREMENTS.....	7
1.3	PURPOSE AND SCOPE OF THIS REPORT	7
1.4	MANAGEMENT OF THIS EMP	7
1.5	LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS OF THIS EMP	8
1.6	ENVIRONMENTAL CONSULTANCY.....	8
2	PROJECT MANAGEMENT PERSONNEL	9
2.1	ORGANISATIONAL STRUCTURE, ROLES, AND RESPONSIBILITIES	9
2.2	CONTRACTORS.....	10
2.3	EMPLOYMENT	10
3	COMMUNICATIONS AND TRAINING	11
3.1	COMMUNICATIONS.....	11
3.2	ENVIRONMENTAL EMERGENCY AND RESPONSE	11
3.3	COMPLAINTS HANDLING AND RECORDING	11
3.4	TRAINING AND AWARENESS.....	12
3.5	SITE INDUCTION	12
4	REPORTING, COMPLIANCE, AND ENFORCEMENT	13
4.1	ENVIRONMENTAL INSPECTIONS AND COMPLIANCE MONITORING.....	13
4.1.1.	DAILY COMPLIANCE MONITORING	13
4.1.2.	MONTHLY COMPLIANCE MONITORING	13
4.2	REPORTING.....	13
4.3	ENVIRONMENTAL PERMITS.....	13
4.4	NON-COMPLIANCE	13
4.5	INCIDENT REPORTING.....	14
4.6	DISCIPLINARY ACTION	14
5	ENVIRONMENTAL AND SOCIAL MANAGEMENT	15
5.1	OBJECTIVES AND TARGETS	15
5.2	REGISTER OF ENVIRONMENTAL RISKS AND ISSUES	15
6	IMPLEMENTATION OF THE EMP	22

LIST OF TABLES

TABLE 1 - KEY ROLES AND RESPONSIBILITIES.....	9
TABLE 2 - EMERGENCY CONTACT DETAILS	11
TABLE 3 - ENVIRONMENTAL RISKS AND ISSUES, AND MITIGATION AND MONITORING MEASURES	16

LIST OF FIGURES

FIGURE 1 – LOCATION OF THE PROPOSED DESALINATION PROJECT, WALVIS BAY.....	6
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DEFINITIONS AND ABBREVIATIONS

dB	Decibels
ECC	Environmental Compliance Consultancy
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
Hz	Hertz
I&APs	Interested and affected parties
kHz	Kilohertz
kPa	Kilopascal
SL	Sound Level

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Environmental Compliance Consultancy (ECC) was engaged by Turnkey Water Solutions (Pty) Ltd and Innovent SAS Joint Venture to compile an Environmental Management Plan (EMP) in accordance with the Environmental Management Act, No. 7 of 2007. The purpose of this EMP is to support the proposed pilot sustainable water supply project by means of desalination and powered by solar to supplement water supply for Walvis Bay. The proposed project is located on a 4ha portion of Walvis Bay municipal land on Erf 4688 in the Erongo Region, Namibia. The preferred site is located north of Kuisebmond, alongside the existing oil and gas jetty, within proximity of existing physical infrastructure. The preferred site location is set out in Figure 1 below.

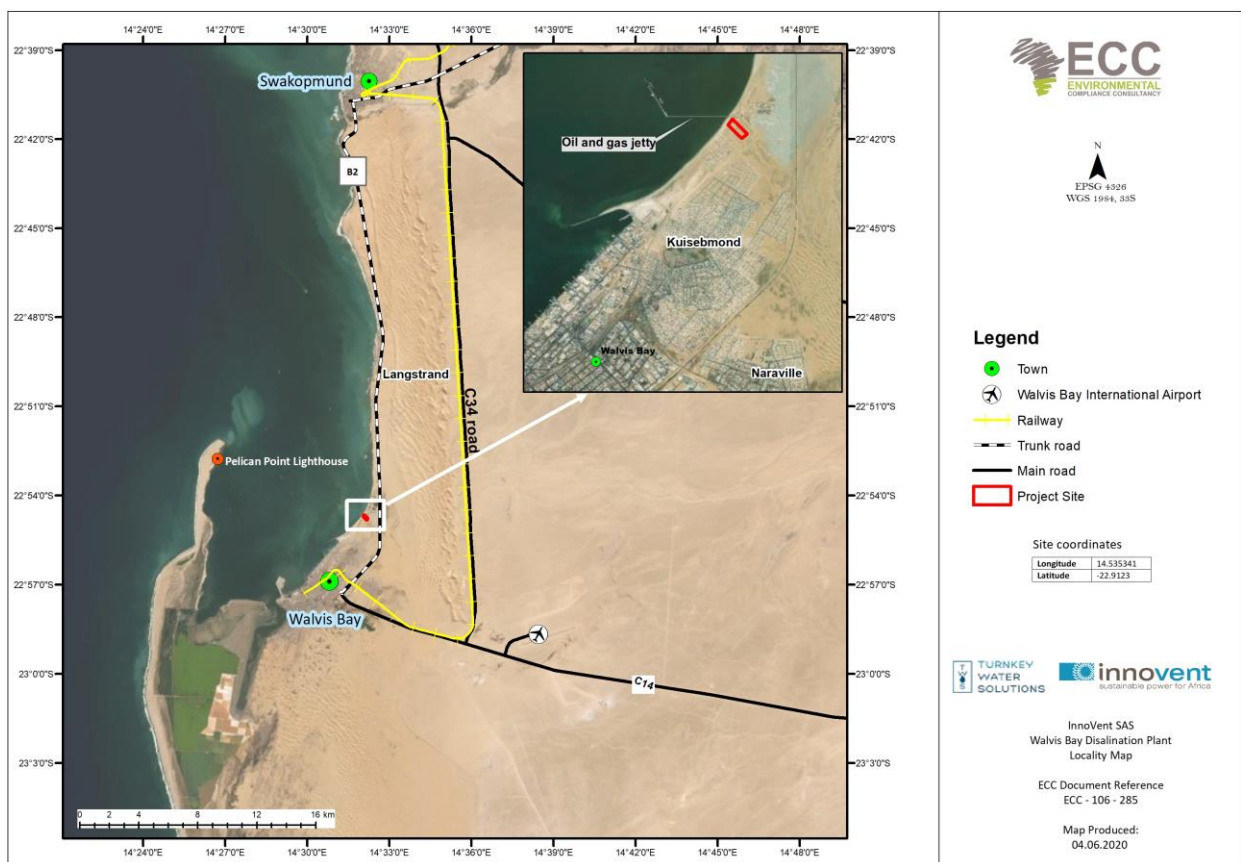


FIGURE 1 – LOCATION OF THE PROPOSED DESALINATION PROJECT, WALVIS BAY

In order to ensure water security and sustainability in the context of population and industry demand growth, as well as considering the potential impacts of climate change, new innovative solutions for supplementing water supply to Walvis Bay is required. Walvis Bay receives less than 50 millimeters average rainfall per year, making it one of the driest inhabited places on earth. Annual average daily demand for the town is estimated at 18,300 m³/day (GLS, 2020). To meet the current water demand, water is supplied to

the municipality from different sources, mainly boreholes in the lower segment of the ephemeral Kuiseb River.

A desalination plant produces water at a constant rate, and as daily and seasonal water demands fluctuate, it is a preferred solution of water supply to a large zone or a reservoir in a coastal urban set-up. In this way a desalination plant plays an important balancing role, augmenting water distribution demands. A volume of 3,900 m³/day was indicated as the potential volume for desalination water injection into the water system of Walvis Bay (GLS, 2020). For the proposed plant, power will be generated on site by a hybrid Photovoltaic (PV) solar plant connected to the grid.

1.2 ENVIRONMENTAL REGULATORY REQUIREMENTS

In terms of the Environmental Impact Assessment (EIA) Regulations and the Environmental Management Act, No. 7 of 2007, the proposed development qualifies as a listed activity. Therefore, an application for an environmental clearance certificate is to be submitted to the Directorate of Environmental Affairs. An Environmental Scoping Report and EMP are required to be submitted as part of the application process, as well as to support the decision-making process. This report presents the EMP and has been undertaken in terms of the requirements of the act and its regulations.

1.3 PURPOSE AND SCOPE OF THIS REPORT

The purpose of this EMP is to provide a management framework for the proposed activities so that the potential environmental impacts identified through the scoping process are avoided, minimised and mitigated as far as reasonably practicable, and that statutory requirements and other legal obligations are fulfilled.

This EMP also presents protocols, procedures, roles and responsibilities to ensure the management arrangements are appropriately and effectively implemented. This EMP forms an appendix to the Environmental Scoping Report and has been based on the findings of the assessment; therefore, the Environmental Scoping Report should be referred to for further information on the proposed project, assessment methodology, applicable legislation, and assessment findings.

This EMP is a live document and shall be reviewed at predetermined intervals, and / or updated when the scope of works alters, or when further data / information can be added. All personnel working on the project will be legally required to comply with the standards set out in this EMP.

The scope of this EMP includes all construction and operational activities carried out.

1.4 MANAGEMENT OF THIS EMP

The proponent, Turnkey Water Solutions (Pty) Ltd and Innovent SAS Joint Venture will hold the environmental clearance certificate for the proposed project and will be responsible for the implementation and management of this EMP. The implementation and management of this EMP and thus the monitoring of compliance shall be undertaken through daily duties and activities and monthly inspections.

This EMP shall be circulated to all contractors and made available on ECC's website.

1.5 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS OF THIS EMP

This EMP does not include measures for compliance with statutory occupational health and safety requirements. This will be provided in the health and safety management plan to be developed by the proponent.

Where there is any conflict between the provisions of this EMP and any contractor's obligations under their respective contracts, including statutory requirements (such as licences, project approval conditions, permits, standards, guidelines, and relevant laws), the contract and statutory requirements are to take precedence.

The information contained in this EMP has been based on the project description as provided in the environmental scoping report. Where the design or construction methods alter, this EMP may require updating and potential further assessment to be undertaken.

1.6 ENVIRONMENTAL CONSULTANCY

Environmental Compliance Consultancy (ECC), a Namibian consultancy with registration number 2013/11401, has prepared this EMP on behalf of the proponent. ECC operates exclusively in the environmental, social, health and safety fields for clients across southern Africa, in the public and private sectors. ECC is independent of the proponent and has no vested or financial interest in the proposed project, except for fair remuneration for professional services rendered.

All compliance and regulatory requirements regarding this document should be forwarded by email or posted to the following address:

Environmental Compliance Consultancy

PO BOX 91193

Klein Windhoek, Namibia

Tel: +264 81 669 7608

Email: info@eccenvironmental.com

2 PROJECT MANAGEMENT PERSONNEL

This EMP provides measures, guidelines, and procedures for managing and mitigating potential environmental impacts. The EMP also indicates monitoring and reporting requirements and sets responsibilities for those carrying out management and mitigation measures. Turnkey Water Solutions (Pty) Ltd and InnoVent SAS Joint Venture shall provide a project team to oversee activities and responsibilities.

2.1 ORGANISATIONAL STRUCTURE, ROLES, AND RESPONSIBILITIES

The proponent shall be responsible for:

- Ensuring all members of the project team, including contractors, comply with the procedures set out in this EMP
- Ensuring that all persons are provided with sufficient training, supervision, and instruction to fulfil this requirement, and
- Ensuring that any person's allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood.

Contractors shall be responsible for ensuring and demonstrating that all personnel employed by them are compliant with this EMP, and meet the responsibilities listed above.

The key personnel and environmental responsibilities of each role are presented in Table 1.

TABLE 1 - KEY ROLES AND RESPONSIBILITIES

ROLE	RESPONSIBILITY & DUTIES
Proponent	<ul style="list-style-type: none"> - Overall responsibility for the implementation and management of this EMP; - Ensure the environmental policy is communicated to all personnel throughout the proposed project and ensure that employees, contractors and visitors understand and adhere to the EMP; - Responsible for providing the required resources (including financial and technical) to complete the required tasks; - Appoint a project manager and a site manager (or nominated supervisor); - Ensure that all employees, contractors and visitors are inducted on environmental measures.
Project Manager	<ul style="list-style-type: none"> - Responsible for ensuring compliance with this EMP including overseeing all day to day activities during the duration of the project, including routine and non-routine maintenance works, as well as decommissioning tasks; - Ensure adequate resources are made available for implementation of this EMP; - Responsible for the management, maintenance and revisions of this EMP; - Ensure all personnel are aware of the commitments made in this EMP and any other relevant regulatory requirements applicable to the project; - Ensure all employees and contractors participate in a site induction process prior to commencing work on the project; - Maintain the community issues and concern register, and keep records of complaints; - Ensure that best environmental practice is undertaken throughout the duration of the project; and - Report any non-compliance or accidents to the regulatory authority.

ROLE	RESPONSIBILITY & DUTIES
Site Manager (or nominated supervisor)	<ul style="list-style-type: none"> - Ensure that all employees, contractors and visitors to the site are conversant with the requirements of this EMP, relevant to their roles on site and adhere to this EMP at all times; - Provide environmental awareness / management training and site inductions for all employees, contractors and visitors; - Monitor daily operations and ensure adherence by personnel to the EMP; - Receive, respond to and record complaints; and - Report any non-compliance or accidents to the project manager.
Employees (and contractors and visitors where applicable)	<ul style="list-style-type: none"> - Responsible for being compliant with this EMP throughout the project; - Adhere to this EMP at all times; - Ensure attendance of site inductions; - Ensure appropriate briefings for certain activities have been provided and are fully understood; and - Report any operations and conditions that deviate from the EMP or any non-compliant issues or accidents to the site manager and project manager.

2.2 CONTRACTORS

Any contractors hired during the project (including contractors appointed for maintenance activities) shall be compliant with this EMP, and shall be responsible for the following:

- Undertaking activities in accordance with this EMP as well as relevant policies, procedures, management plans, statutory requirements, and contract requirements;
- Implement appropriate environmental and safety management measures;
- Report environmental issues, including actual or potential environmental incidents and hazards, to the project manager; and
- Ensure appropriate corrective or remedial action is taken to address all environmental hazards and incidents reported.

2.3 EMPLOYMENT

The proponent should ensure that a locals first policy be adopted on the project pertaining to employment opportunities during the construction and operational phase of the project. The following shall be complied with:

- In liaison with the relevant authorities, the proponent shall ensure that local people have access to information about job opportunities and are considered first for contract employment positions;
- The number of job opportunities shall be made known together with the associated skills and qualifications;
- The maximum length of time the job is likely to last for shall be clearly indicated;
- Foreign workers with no proof of permanent legal residence shall not be hired; and
- Every effort shall be made to recruit from the pool of unemployed workers living in the local area.

3 COMMUNICATIONS AND TRAINING

In order to ensure potential risks and impacts are minimised, it is vital that personnel are appropriately informed and trained on operational procedures that include the above mitigation measures. It is also important that regular communications are maintained with all the stakeholders and made aware of potential impacts and how to minimise or avoid them. This section sets out the framework for communication and training in relation to the EMP.

3.1 COMMUNICATIONS

During the entire project, the project manager and / or site manager (or nominated site supervisor) shall communicate site-wide environmental issues to the project team through the following means (as and when required):

- Site induction
- Audits and site inspections
- Toolbox talks, including instruction on incident response procedures, and
- Briefings on key project-specific environmental issues

This EMP shall be distributed to the project team, including contractors, to ensure that the environmental requirements are communicated effectively. Key activities and environmentally sensitive operations shall also be briefed to workers and contractors.

During the entire project regular communications between the management team shall include discussing any complaints received and actions to resolve them; any inspections, audits or non-conformance with this EMP and any objectives or target achievements.

3.2 ENVIRONMENTAL EMERGENCY AND RESPONSE

Table 2 contains a list of numbers to be contacted in case of an emergency. All personnel will be made aware of these numbers.

TABLE 2 - EMERGENCY CONTACT DETAILS

TOWN	AMBULANCE	POLICE	FIRE BRIGADE
Walvis Bay	+264 (64) 51 0022	+264 (64) 10111	+264 (64) 51 0171

3.3 COMPLAINTS HANDLING AND RECORDING

Any complaints received verbally or in writing by any personnel on the project site shall be recorded by the receiver, including the name and contact details of the complainant, date and time of the complaint, and the nature of the complaint. The information shall be given to the project manager who is overall responsible for the management of complaints and will provide a written response to the complainant. The project manager shall inform employees of issues, concerns or complaints.

The project manager shall maintain a complaint register that will detail the name and contact details of the complainant, date and time of the complaint, nature of the complaint, action is taken to resolve issues, and date of complaint handover. The project manager shall be responsible for nominating the correct personnel to coordinate and resolve the issue.

The workforce shall be informed about the complaints register, its location and the person responsible, in order to refer local residents or the general public who wish to lodge a complaint. The complainant shall be informed in writing of the results of the investigation and action to be taken to rectify or address the matter(s). Where no action is taken, the reasons are to be recorded in the register.

The complaints register shall be kept for the duration of the project and will be available for government or public review upon request.

3.4 TRAINING AND AWARENESS

All personnel working on the project shall be competent to perform tasks that have the potential to cause an environmental impact. Competence is defined in terms of appropriate education, training and experience.

3.5 SITE INDUCTION

All personnel involved in the project, contractors and visitors shall be inducted to the site with specific environmental and social awareness training, and health and safety issues. The environment and social awareness training shall ensure that everybody on site is familiar with the principles of this EMP, the environment and social aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures.

The project manager shall ensure a register of completed training is maintained.

The site induction should include, but not limited to the following:

- A general site-specific induction that outlines:
 - o What is meant by “environment” and “social”;
 - o Why the environment needs to be protected and conserved;
 - o How construction activities can impact on the environment; and
 - o What can be done to mitigate against such impacts;
- The inductee’s role and responsibilities with respect to implementing the EMP;
- The site environmental rules;
- Details of how to deal with, and who to contact if environmental problems should occur;
- Focal themes such as compliance, reporting of accidents and incidents, good housekeeping and standard procedures for waste management
- The potential consequences of non-compliance with this EMP and relevant statutory requirements, and
- The role of responsible people for the project.

4 REPORTING, COMPLIANCE, AND ENFORCEMENT

4.1 ENVIRONMENTAL INSPECTIONS AND COMPLIANCE MONITORING

4.1.1. DAILY COMPLIANCE MONITORING

A copy of this EMP shall be on-site throughout the duration of the project and shall be available upon request. It is the responsibility of the project manager and site manager (or nominated site supervisor) to ensure this EMP is complied with through their daily roles. Daily, weekly and monthly inspections will be undertaken. Any environmental problems or risks identified shall be notified to the project manager and actioned as soon as is reasonably practicable.

4.1.2. MONTHLY COMPLIANCE MONITORING

Monthly inspections shall be undertaken by the site manager to check that the standards and procedures set out in this EMP are being complied with and pollution control measures are in place and working correctly. Any non-conformance shall be recorded, including the following details: a brief description of non-conformance; the reason for the non-conformance; the responsible party; the result (consequence); and the corrective action taken and any necessary follow up measures required.

4.2 REPORTING

There shall be a requirement to ensure that any incident or non-compliance, including any environmental issue, failure of equipment or accident, is reported to the project manager immediately.

4.3 ENVIRONMENTAL PERMITS

Whilst the Water Resources Management Act, No. 11 of 2013 is not enforced, it is best practice to adhere to its stipulations while ensuring compliance with the Water Act, No. 54 of 1956, which is maintained still. A licence to abstract water, also seawater, is required. As the abstraction of seawater will be obtained through beach boreholes, permit(s) to drill these boreholes need to be obtained as well. A permit to discharge brine is also required. The proponent will apply for the relevant permits and shall operate in accordance with any conditions stipulated.

4.4 NON-COMPLIANCE

Where it has been identified that activities are not compliant with this EMP, the project manager shall employ corrective actions so that the activities return to being compliant as soon as possible. In instances where the requirements of the EMP are not upheld, a non-conformance and corrective action notice shall be produced. The notice shall be generated during the inspections and the project manager shall be responsible for ensuring a corrective action plan is established and implemented to address the identified shortcoming.

A non-compliance event / situation, for example, is considered if:

- There is evidence of the contravention of this EMP and associated indicators or objectives;
- The project manager and / or site manager (or nominated supervisor) have failed to comply with corrective or other instructions issued by the project manager or qualified authority; or

- The project manager and /or site manager (or nominated supervisor) fail to respond to complaints from the public

Activities shall be stopped in the event of a non-compliance until corrective action(s) has been completed.

4.5 INCIDENT REPORTING

The project manager must ensure that an accident and incident (including minor or near-miss) reporting system is maintained so that all applicable statutory requirements are covered. For any serious incident involving a fatality, or permanent disability, the incident scene must be left untouched until witnessed by a representative of the police. This requirement does not preclude immediate first aid being administered and the location being made safe.

The project manager must investigate the cause of all work accidents and significant incidents and must provide the results of the investigation and recommendations on how to prevent a recurrence of such incidents. A formal root-cause investigation process should be followed.

4.6 DISCIPLINARY ACTION

This EMP is a legally binding document and non-compliance with it shall result in disciplinary action being taken against the perpetrator/s. Such action may take the form of (but is not limited to):

- Fines / penalties
- Legal action
- Monetary penalties imposed by the proponent on the contractor
- Withdrawal of license/s, and
- Suspension of work.

The disciplinary action shall be determined according to the nature and extent of the transgression / non-compliance, and penalties are to be weighed against the severity of the incident.

5 ENVIRONMENTAL AND SOCIAL MANAGEMENT

5.1 OBJECTIVES AND TARGETS

Environmental objectives for the project are as follows:

- Zero pollution incidents
- Minimal disturbance to avifauna
- Minimal disturbance to marine mammals
- Minimise the generation of waste

5.2 REGISTER OF ENVIRONMENTAL RISKS AND ISSUES

An environmental review of the proposed project has been completed to identify all the commitments and agreements made within the environmental scoping report. From this, a list of environmental commitments and risks were produced, which details deliverables including measures identified for the prevention of pollution or damage to the environment during the project.

Table 3 provides a register of environmental risks and issues, which identifies mitigation and monitoring measures, as well as the responsible person. This register will be subject to regular review by the project manager and updated when necessary. The project manager will use this register to undertake monthly inspections to ensure the project is compliant with this EMP.

TABLE 3 - ENVIRONMENTAL RISKS AND ISSUES, AND MITIGATION AND MONITORING MEASURES

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
CONSTRUCTION PHASE				
General construction activities (terrain preparation, excavation, drilling of boreholes, and general construction)	<ul style="list-style-type: none"> - Potential pollution to the environment (on-land and marine) - Potential risk to the occupational health and safety of construction crew. - Potential nuisance effect on community 	<ul style="list-style-type: none"> - Develop and implement an operations manual or procedures to conduct work and implement monitoring programmes thereafter, - Conduct site toolbox talks before shifts commence, - Maintain continuous communication with I&APs to identify concerns and mitigation measures, - Compliance with all applicable laws and agreements - Training and raise awareness to sensitize employees about contentious issues illegal collecting of marine resources - Ensure appropriate supervision of all activities - Accidents and incidents need to be reported to project manager and recorded in incident register. - Store bulk fuel in adequate containment areas (non-porous surface, banded). Preventative measures will be in place when service and maintenance activities are done (drip trays, non-porous surfaces, funnels, non-damaged containers). - Refuelling will be done in areas with adequate preventative measures in place. - Drilling of boreholes to be done only with an approved permit obtained from the Ministry of Agriculture and Water & Land Reform. 	Weekly, monthly	Site manager and / or Project manager or the nominated site supervisor
	<ul style="list-style-type: none"> - Movement of heavy equipment and vehicles, - Nuisance (noise), pollution emissions Light disturbances 	<ul style="list-style-type: none"> - Maintain good housekeeping, - Apply dust suppression where possible, - Restrict speed of vehicles, - Specific activities that may generate noise, dust and emissions shall be avoided during high wind events, - All vehicles and machinery / equipment to be shut down or throttled back between periods of use, - Restrict construction activities to daytime hours (7 am to 5 pm weekdays and 7 am until 1 pm on Saturday), - Continuous engagement with residents to identify any concerns or issues, and appropriate mitigation and management measures agreed upon. - All building lights should be placed facing downward to the ground. Lights should never face upward. This is to avoid any animals being attracted to the site. 	Daily throughout the construction of the trench.	

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
	<ul style="list-style-type: none"> - Dust and emissions 	<ul style="list-style-type: none"> - All vehicles and machinery / equipment to be shut down or throttled back between periods of use, - Use one identified access route only, - Apply dust suppression where possible, - Restrict speed of vehicles, - Specific activities that may generate dust and impact on residents shall be avoided during high wind events. 	Daily, weekly	
	<ul style="list-style-type: none"> - Loss of soil quality due to mixing of earth matter, trampling, compaction and pollution, - Enhanced wind erosion 	<ul style="list-style-type: none"> - Ensure prevention measures are in place when terrain activities take place. No concrete mixing to take place on open soil. - Avoid activities during windy conditions - Where necessary, establish wind erosion barriers to curb possible erosion - Limit the possibility of compaction and creation of a hard subsurface in and outside the site. Areas utilized as construction equipment laydown areas should not be allowed to remain compacted after the construction period. Area should be ripped to loosen soil. - Limit the possibility of trampling - Equipment and vehicles must be in a good condition to ensure that accidental oil spills do not occur and contaminate soil - In the event of spills and leaks, polluted soils must be collected and disposed of at an approved site 	Daily	
	<ul style="list-style-type: none"> - Alien plants and weeds can accidentally be introduced 	<ul style="list-style-type: none"> - Monitor areas of activity for alien species - Eradicate alien species as soon as they appears - Make workers aware about alien species 	Monthly	
	<ul style="list-style-type: none"> - Loss / alteration of marine habitats and loss of species 	<ul style="list-style-type: none"> - Compulsory toolbox talks and induction to make workers aware and notify them on avoiding some areas, - No organism (i.e. fish, may be caught, consumed or removed from site, - Determine the line / route of activity and restrict all activities to a demarcated area, - Set and implement a reportable monitoring program during construction, which is approved by the competent authority, - Reinstate and rehabilitate where necessary. 	Monthly	

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
Pile Driving	<ul style="list-style-type: none"> - Marine mammals visiting the bay can be temporarily disturbed as a result of ambient noise from construction activities i.e. pile driving to prepare the area for trenching afterwards. 	<ul style="list-style-type: none"> - Emphasis is placed on the developer to deter animals from the vicinity through the use of either one of the 3 measures proposed. - Pile boundaries should be higher than the water mark to minimize overflow, - The use of acoustic deterrent devices: <ul style="list-style-type: none"> o Screens or coffer dams can decrease sound levels (SL) by 5 – 25 dB. o Bubble curtains installed around the pile structure can reduce SL by 20 dB, particularly at 400–6400 Hz. - Implementing a “soft start” procedure (i.e. the pile driving at lower hammer energy and longer lag time between hammer hits for a specified time period at the start of the piling process can decrease SL by 10-15 dB at frequencies > 2 kHz). - Underwater noise from pile driving activities should be monitored to verify that it does not exceed 30 kPa at a distance of 1 m to 2 m from the pilings. If it does, measures should be taken to reduce either the intensity of the sound or the way the sound is propagated. These measures can be chosen based on practicality and effectiveness (e.g. installing silt or bubble curtains, vibratory/hydraulic vs impact piling). - Restrict excessive noise to areas of activities only, - Restrict excessive noise to daytime hours (7 am to 5 pm weekdays and 7 am until 1 pm on Saturday), - No activities between dusk and dawn, - All equipment to be shut down or throttled back between periods of use. - Implement an appropriate marine mammal visual monitoring routine sufficient to ensure the effectiveness of the exclusion zone (around the construction area) is maintained. - All impact pile driving will be halted once a marine mammal is observed within 10m of the active construction area. Pile driving can then resume after the marine mammal observed, has left the area. 	Daily	Contractor and project manager

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
Trenching, excavation and the construction of infrastructure below the high-water mark	<ul style="list-style-type: none"> - Soil contamination - Water contamination 	<ul style="list-style-type: none"> - Training through toolbox talks and induction. - All stationary vehicles and machinery must have drip trays to collect leakages of lubricants and oil. - Spill kits and absorption material available during fuel delivery, storage or use. - Accidental spills and leaks (including absorption material) to be cleaned as soon as possible. - Major spills to be reported, also to the authorities. - Maintenance and service schedules on equipment are in place. - No damaged containers in use. 	Daily	Project manager and / or site manager (or nominated site supervisor)
Fuel handling and storage, maintenance on equipment, machinery and vehicles	<ul style="list-style-type: none"> - Soil contamination - Groundwater contamination - Nuisance (visual impacts, litter) - Ecological (marine and terrestrial) risks 	<ul style="list-style-type: none"> - Good housekeeping, - Training and awareness through toolbox talks and induction, - Implement a Standard Operational Procedure on waste management, from cradle to grave for all kinds of waste possible on-site, - Raise awareness about the importance of responsible waste management, including wastewater management, - Implement a culture of correct waste collection, waste segregation and waste disposal, - Avoid hazardous waste on site, - Wastewater discharges will be contained – no disposal of waste water. - All fuel and petrochemical products are to be stored on an impermeable, bunded and covered surface that is clearly marked and access controlled. 	Daily	<ul style="list-style-type: none"> - Employees, contractors - Site manager (or nominated site supervisor)
Job creation, skills development and business opportunities	Beneficial socio-economic impacts on a local and regional scale.	<ul style="list-style-type: none"> - Maximise local employment and local business opportunities, - Enhance the use of local labour and local skills as far as reasonably possible, - Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible. 	Monthly	Project manager
OPERATIONAL PHASE				

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY														
Brine Discharge	Possible adverse effects on the marine and avifauna environment.	<ul style="list-style-type: none"> - Set required dilution targets (for critical constituents). <ul style="list-style-type: none"> o Only salinity was identified as a critical constituent in the brine effluent. - Salinity dilution must achieve acceptable concentration levels and meet targets as set out in the table below (WAMTech, 2020). <table border="1" data-bbox="685 464 1688 772"> <thead> <tr> <th>Constituent</th> <th>Background</th> <th>Guideline</th> <th>Effluent conc.(mg/l)</th> <th>Required dilutions</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Salinity</td> <td rowspan="3">34.5 ppt</td> <td rowspan="3">36 ppt</td> <td>51.9 ppt (minimum)</td> <td>12</td> </tr> <tr> <td>55.6 ppt (average)</td> <td>14</td> </tr> <tr> <td>58.6 ppt (maximum)</td> <td>16</td> </tr> </tbody> </table> <ul style="list-style-type: none"> - Incorporate specific configuration and hydraulic performance requirements in the design of the outfall infrastructure (the pipeline and diffuser), - Set and implement a reportable monitoring program during operations, which is approved by the competent authority to monitor feed, treatment and disposal infrastructure integrity, - Whenever inconsistencies arise a data logging system as per the proponent's discretion should be installed and used. - Implement a system inspection regime, - In collaboration with the competent authority, implement procedures in case of accidents or failure of the system to perform to expected standards. 	Constituent	Background	Guideline	Effluent conc.(mg/l)	Required dilutions	Salinity	34.5 ppt	36 ppt	51.9 ppt (minimum)	12	55.6 ppt (average)	14	58.6 ppt (maximum)	16	Daily	Site manager or nominated site supervisor and/or Project manager (if stationed on-site)
Constituent	Background	Guideline	Effluent conc.(mg/l)	Required dilutions														
Salinity	34.5 ppt	36 ppt	51.9 ppt (minimum)	12														
			55.6 ppt (average)	14														
			58.6 ppt (maximum)	16														
Job creation, skills development and business opportunities	Beneficial socio-economic impacts on a local and regional scale.	<ul style="list-style-type: none"> - Maximise local employment and local business opportunities, - Enhance the use of local labour and local skills as far as reasonably possible, - Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible. 	Quarterly	Project manager														

ACTIVITY	POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
Generation of general waste	<ul style="list-style-type: none"> - Soil contamination due to the potential presence of cadmium and/ or lead component parts leaking from broken panels. - If only aluminium and copper parts are present in the panel structure than waste disposal and recycling is easier. 	<ul style="list-style-type: none"> - Only use a designated solar panel waste disposal agent that can handle toxic waste (if the presence of cadmium or lead parts is established) to dispose of solar panel waste. The closest handler is situated in SA. - If panels do not contain the mentioned deleterious chemicals then NamiGreen or Scrap Metal can be used as the disposal agent of onsite solar panel waste, - Good practise guidelines dictates that the selection of Poly-Crystalline panels greatly reduces the frequency of spent panels when compared to thin-filmed module technology, - Never allow waste panels to be stockpiled on the erf outside of a proper containment drum that is covered, Maintain panel integrity to maximise use long term. 	Annually	<ul style="list-style-type: none"> - Employees, contractors - Site manager (or nominated site supervisor)

6 IMPLEMENTATION OF THE EMP

All construction activities will be carried out in compliance with the relevant legal requirements and the drilling of beach boreholes to abstract seawater as well as the discharge of brine will be done in accordance with the Water Act, No 54 of 1956. Whilst the construction and operation of the proposed project does not fall under the Marine Resources Act, No. 27 of 2000, it is recognised that as an indirect consequence of the project, some activities may infer to the act – therefore the EMP considers the relevant guidelines and requirements of the act.

No significant impacts are anticipated for the activities that have been identified and management and mitigation measures are in place for potential risks.

This EMP:

- Has been prepared pursuant to a contract with the proponent
- Has been prepared on the basis of information provided to ECC up to July 2020
- Is for the sole use of the proponent, for the sole purpose of an EMP
- Must not be used (1) by any person other than the proponent or (2) for a purpose other than an EMP, and
- Must not be copied without the prior written permission of ECC.

ECC has prepared the EMP on the basis of information provided by the proponent and the environmental impact assessment report