



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

**SCOPING & ENVIRONMENTAL IMPACT ASSESSMENT (S&EIA) FOR THE
PROPOSED 2MLD SOLAR POWERED SEAWATER DESALINATION
PLANT IN THE PORT OF EAST LONDON, BUFFALO CITY
METROPOLITAN MUNICIPALITY, EASTERN CAPE PROVINCE, BY
TRANSNET NATIONAL PORTS AUTHORITY**

DFFE Pre-Application Ref No: 2026-04-0038



July 2026



ANCHOR
environmental

PART OF



REPORT DETAILS

DFFE EA Pre-Application Ref No: 2026-04-0038

Report Status: Draft Environmental Management Programme (EMPr)

Project Title: Scoping & Environmental Impact Assessment (S&EIA) for the 2MLD Solar Powered Seawater Desalination Plant in the Port of East London, Buffalo City Metropolitan Municipality, Eastern Cape Province, by Transnet National Ports Authority

Report Date: 13 July 2026

Physical Location: Erven 63584, 38530 and 63586; Harbour; 5201; Port of East London; East London; Buffalo City Metropolitan Municipality; Eastern Cape Province; South Africa.

Report prepared for/ Client: Transnet SOC Limited—Division Transnet National Ports Authority (TNPA)—East London Port; Hely Hutchinson Rd, Quigney, East London, 5211

Report Prepared by: Anchor Environmental Consultants (Pty) Ltd—8 Steenberg House, Silverwood Close, Tokai, South Africa.

Citation: Swart C, Armitage MPA, and De Villiers A. 2026. Draft Environmental Management Programme (EMPr) — Scoping & Environmental Impact Assessment (S&EIA) for the Proposed 2MLD Solar Powered Seawater Desalination Plant in the Port of East London, Buffalo City Metropolitan Municipality, Eastern Cape Province, by Transnet National Ports Authority. Specialist Report no. 2176/16 prepared by Anchor Environmental Consultants (Pty) Ltd for Transnet National Ports Authority. 72pp+Appendices.

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LIST OF ABBREVIATIONS

Anchor	Anchor Environmental Consultants (Pty) Ltd
BA	Basic Assessment
CA	Competent Authority
CIP	Clean in Place
CWDP	Coastal Waters Discharge Permit
DC	Direct Current
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EFZ	Estuarine Functional Zone
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EMS	Emergency Medical Services
EO	Environmental Officer
IMS	Integrated Management System
ML	Million litres
MLD	Million litres per day
MLRA	Marine Living Resources Act
MSDS	Material Safety Data Sheet
NEM:AQA	National Environmental Management: Air Quality Act, 2004
NEM:BA	National Environmental Management: Biodiversity Act, 2004
NEM:ICMA	National Environmental Management: Integrated Coastal Management, 2008
NEM:WA	National Environmental Management: Waste Act, 2008
NEMA	National Environmental Management Act, 1998
NHRA	National Heritage Resources Act, 1999
NWA	National Water Act, 1998
PPE	Personal Protective Equipment
PV	Solar photovoltaic
QMS	Quality Management System
S&EIA	Scoping and Environmental Impact Assessment
Sunwater	Sunwater East London (Pty) Ltd
RO	Reverse Osmosis
TNPA	Transnet Port Authority

DEFINITIONS

In this EMPr, any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

Clearing: The clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified.

Contractor: The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

Construction camp: The area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management.

Method Statement: A written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The Method Statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification.

Hazardous Substances: A substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995.

Slope: The inclination of a surface expressed as one unit of rise or fall for so many horizontal units.

Solid waste: All solid waste, including construction debris, hazardous waste, excess cement/concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Spoil: Excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works.

Topsoil: A varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil.

Works: The Works to be executed in terms of the Contract.

I SCOPE AND CONTENT OF AN ENVIRONMENTAL MANAGEMENT PROGRAMME

I.1 BACKGROUND AND SCOPE OF AN EMPR

The EMPr is a proactive management tool that guides consistent and ongoing environmental management throughout the life cycle of a development, from pre-construction through construction, operation, and ultimately decommissioning. Its purpose is to prevent or minimise negative impacts through mitigation measures, while enhancing the positive benefits of a development through optimisation measures.

The EMPr follows an outcome-based approach. This means that the focus is on achieving defined environmental management outcomes, rather than prescribing rigid actions in all circumstances. To achieve these outcomes, the EMPr sets out a range of management actions consisting of mitigation and optimisation measures and recommendations identified during the EIA by the specialists and Environmental Assessment Practitioner (EAP). These may include specific practical site management actions, monitoring programmes, supporting management plans, rehabilitation measures, species search-and-rescue operations, or other environmental management interventions. In this way, the EMPr ensures that a project's actual impacts remain consistent with those assessed during the EIA, and that commitments made during planning and assessment are carried through to implementation. **Mitigation / impact management measures** for mitigating negative impacts are classified as either:

- **Essential:** Mandatory measures that must be implemented and are non-negotiable; or
- **Best Practice / Recommended:** Non-mandatory measures that should be implemented where feasible and appropriate. Alternative measures or approaches may be adopted, provided that the required environmental outcome is still achieved and a clear and defensible motivation is provided for not implementing the recommended measure.

Optimisation measures aimed at enhancing potential benefits are generally considered **Best Practice / Recommended** and are non-mandatory.

The EMPr is therefore intended to allow a degree of flexibility in implementation, provided that the required environmental outcomes are achieved and compliance with the EA and relevant environmental legislation is maintained. More information on the implementation and amendment of management outcomes and actions is provided in Section 1.3 and 3.12.

The EMPr is legally binding on the Environmental Authorisation (EA) holder (i.e. the Developer), Contractor(s), and anyone acting on their behalf. It is usually included as a condition of the EA and must therefore be implemented accordingly.

It further outlines the Developer/ Contractor's responsibilities in achieving the environmental outcomes, especially with regards to preventing and mitigating any

negative environmental effects resulting from project-related construction and operational activities.

I.2 CONTENT OF AN ENVIRONMENTAL MANAGEMENT PROGRAMME

The EMP must be prepared in accordance with Appendix 4 of the NEMA Environmental Impact Assessment Regulations (EIA Regulations) 2014 (as amended). The EMP must address the management and monitoring of the potential environmental impacts of the proposed activity on the environment throughout the project life cycle. Table 1.1 lists the prescribed requirements for an EMP and identifies the relevant section or appendix where each item is addressed. This table serves as both a directory to assist readers in navigating the report and a checklist demonstrating compliance with the EIA Regulations.

Table 1.1. Legally Required Content of an Environmental Management Programme, as detailed in Appendix 4 of the Environmental Impact Assessment Regulations (published in GNR 326 and GNR 517).

Content of the Environmental Impact Assessment Report		Section/ Page Numbers
An EMP must comply with section 24N of the Act and include-		Relevant Section
	details of-	
(a)	(i) the EAP who prepared the EMP; and	Section 4.2 and Appendix 1
	(ii) the expertise of that EAP to prepare an EMP, including a curriculum vitae;	Section 4.2 and Appendix 1
(b)	a detailed description of the aspects of the activity that are covered by the EMP as identified by the project description;	Section 2
(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers	Section 2 and Appendix 2
(d)	a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated, as identified through the environmental impact assessment process for all phases of the development, including-	Section 5; Section 6 and Section 7
	(i) planning and design;	Section 5
	(ii) pre-construction activities;	Section 5
	(iii) construction activities;	Section 6
	(iv) rehabilitation of the environment after construction and, in the case of a closure activity, closure; and	Section 6
	(v) where relevant, operation activities;	Section 7
(f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to-	Section 5; Section 6 and Section 7
	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 5; Section 6 and Section 7
	(ii) comply with any prescribed environmental management standards or practices; and	Section 5; Section 6 and Section 7
	(iii) comply with any applicable provisions of the Act regarding closure, in the case of a closure activity;	N/A
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 3

Content of the Environmental Impact Assessment Report		Section/ Page Numbers
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 3
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 2, Section 5; Section 6 and Section 7
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 3
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 3
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the regulations;	Section 3
(m)	an environmental awareness plan describing the manner in which-	Section 3
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 3
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 3
(n)	any specific information that may be required by the competent authority.	N/A

I.3 ASPECTS OF THE ACTIVITY THAT ARE COVERED BY THE EMPR

This EMPr has been compiled to guide the management of all project components and associated activities, as described above. It applies across the pre-construction, construction, and operational phases (Section 5, Section 6 and Section 7). It addresses a wide range of aspects, including: Planning and Design; Environmental Training, Health and Safety Training, Rehabilitation Plans and the management of Dust, Soil and Earthworks, Erosion, Waste, Hazardous Substances and Spills, Fires, Ecological Receptors, Storm Water, Effluent, Potable Water, Traffic, Heritage Resources, Community and Social Aspects, Visual Aspects, Economic Aspects and Noise.

The EMPr sets out specific management actions to achieve defined outcomes, with the goal of preventing or mitigating negative environmental impacts on key receptors such as fauna and flora, water resources, heritage resources, and the surrounding community, while enhancing the positive benefits.

This outcome-based approach focuses on achieving defined environmental outcomes rather than prescribing rigid actions in all circumstances. The EMPr therefore allows a degree of flexibility in implementation, provided that the required outcomes are achieved and compliance with the EA and applicable environmental legislation is maintained. This approach also enables adaptive management and refinement of actions based on practical implementation experience during the project lifecycle.

Any amendments to management actions must be approved by the Environmental Control Officer (ECO), in consultation with the relevant specialist where necessary, depending on the nature of the alteration and whether the ECO has sufficient expertise in the relevant field. Such changes must also be undertaken in accordance with Regulation 36(1) of the EIA Regulations, 2014, as outlined in Section 3.12, and must remain consistent with the NEMA Precautionary Principle.

It should further be noted that management actions are classified as either Essential or Best Practice / Recommended, as mentioned in Section 1.1. Essential measures are mandatory and non-negotiable, and any changes to these require ECO approval as described above. Best Practice / Recommended measures are non-mandatory and may be adapted or replaced where appropriate, provided that the required environmental outcome is still achieved and a clear motivation is provided for not implementing the recommended approach. These measures do not necessarily require formal amendment procedures.

It should be noted that Sections 1, 2 and 3 provide general guidance and background information and are not legally binding, while Sections 4, 5, 6 and 7 are legally binding. Effective implementation of the legally binding sections requires adherence to the guidance in the earlier sections. The successful implementation of this EMPr also depends on the participation of several role-players, each with defined responsibilities (see Section 2).

Sections 1, 2, 3 should therefore still be followed to the extent necessary to ensure full compliance with the binding requirements. For this reason, it is recommended that the entire EMPr be implemented as comprehensively as possible. The holder of the EA and the Contractor are informed that they will be monitored and audited on their compliance with Sections 5, 6 and 7 (refer to Section 3.9 and Section 3.10).

2 ROLES AND RESPONSIBILITIES

The effective implementation of the EMPr is dependent on established and clear roles, responsibilities, and reporting lines. Table 2.1 identifies the key stakeholders and their roles and responsibilities in the implementation of the EMPr. This list is not exhaustive and additional roles and responsibilities might be identified by the Competent Authority, Developer, Contractor and/ or ECO. Also note that some of the roles and responsibilities might, in some instances, overlap or be undertaken jointly/ shared.

Table 2.1. Stakeholders and their roles and responsibilities in the implementation of the EMPr.

Function	Roles and Responsibilities
Competent Authority	Department of Forestry, Fisheries and the Environment <u>Responsibility</u> Overseeing compliance with the Environmental Authorisation and EMPr by reviewing audit reports submitted by the appointed independent experienced Environmental Control Officer (ECO).
Holder of the Environmental Authorisation (EA)/ Developer and Project Manager	Transnet (SOC) Ltd —Division TNPA Holds legal responsibility for compliance with the EA and EMPr and is accountable for the potential impacts of the activities that are undertaken. Any other arrangements must be entered into between such holder and such other party (e.g., Contractor). The Developer's Project Manager will have overall responsibility for the management of the project and the implementation of the EMPr. <u>Responsibilities:</u> - Must be fully conversant with the conditions of the EA and management outcomes and actions of this EMPr; - Overall management of the project and ensuring compliance with the EA and approved EMPr; - Ensure that all stipulations within the EA and EMPr are communicated and adhered to by the Developer and its Contractor(s); - Appointing an independent experienced Environmental Control Officer (ECO); - Ensure that the Contractor appoints a Contractor's Environmental Officer (EO); - Liaising with Authorities, Contractor, ECO, and any other parties involved in this project; - Works together with the Contractor or Contractor's EO to assist in the implementation of their Responsibilities and in addressing environmental challenges where needed/ required; - Ensuring sufficient budget and resource allocation for the implementation of the EA conditions and EMPr requirements; - Monitoring the implementation of the EMPr throughout the project by means of site inspections and meetings; - Ensuring all permits, authorisations and licences are obtained, monitored and adhered to;

Function	Roles and Responsibilities
	- Reviewing and approving all method statements (see Section 3.2) prior to the commencement of activities (or as required throughout the various project phases); and - Ensuring adherence to all statutory safety, health and environmental standards.
Contractor	Sunwater East London Joint Venture (Pty) Ltd (Sunwater) The Contractor (including Subcontractors and contract workers) is responsible for all activities undertaken during the contract period. Together with the Developer, the Contractor is accountable for any potential environmental impacts arising from these activities and is responsible for ensuring that such impacts are effectively managed. The Contractor will be held liable for any remedial work required in terms of the EMPr owing to environmental negligence, mismanagement, or non-conformance. <u>Responsibilities:</u> - Ensuring work is conducted in terms of the framework of the EA, EMPr, approved method statements and applicable legislation. - Ensuring that all Subcontractors have a copy of, and are fully conversant with, the contents of the EA, EMPr and approved method statements. - Confining the construction site to demarcated area; - Responsible for submitting all required method statements to the developer for review, prior to the commencement of activities (or as required throughout the various project phases). This includes statements falling under the ambit of the contractor, as well as any relevant subconsultants (see Section 3.2). - Appointing of a Contractor's Environmental Officer (EO) and potentially Health and Safety (H&S)/ Safety, Health and Environmental (SHE) Officer. - Ensuring adherence to all statutory safety, health and environmental standards. - Notifying the Developer of any incidents, as defined in Section 30(1)(a) of NEMA (Control of Emergency Incident). - Notifying the Developer of changes in the development that may result in significant environmental impacts. - Compiling and maintaining relevant documentation for the ECO. - Any other responsibilities, as determined by the Developer. .
Contractor's EO	The Contractor's EO is appointed by the Contractor. This person is responsible for assisting the Contractor, and monitoring compliance of the Contractor, with the on-site implementation of (and compliance with) the EA, EMPr (or relevant sections of the EMPr), Method Statements, and Coastal Waters Discharge Permits (CWDP). The Contractor's EO officer must be a dedicated resource to the project. The Contractor must ensure that the Contractor's EO is suitably qualified to perform the necessary tasks and is appointed at a professional level such that they can interact effectively with other site Contractors, labourers, the Developer, the ECO and the public.

Function	Roles and Responsibilities
	<u>Qualification Requirements</u> This person must, as a minimum, have the following qualifications and experience: • Be an appropriately qualified EO officer with a suitable environmental diploma or degree; • Have demonstrated and relevant environmental experience in the construction industry; • Be senior enough to have authority over all the contractors' staff working on-site; • Understand the hierarchy of Environmental Compliance Reporting, and the implications of non-compliance; and • Be able to resolve conflicts and make recommendations on site, in terms of compliance with requirements of EA and EMPr. <u>Responsibilities:</u> • Must be fully conversant with the conditions of the EA; management outcomes and actions of this EMPr, how to implement these, and with all relevant environmental legislation; • Know the background of the development and understand the implementation programme; • Ensure that all the requirements stipulated in the EA, EMPr, CWDP and Method Statements are communicated to all staff on site through conducting environmental awareness training; • Confine the construction site to the demarcated area; • Manage the "day-to-day" on-site implementation of the requirements stipulated in the EA, EMPr (this document), Method Statements and CWDP by ensuring that these are adhered to by all staff on site. Further refer to Section 5, Section 6 and Section 7 for the specific Environmental Management Measures which must be implemented and monitored for compliance; • Conduct weekly site inspections during the construction phase and monthly site inspections during the operational phase, to ensure the implementation of the requirements stipulated in the EA, EMPr, CWDP and Method Statements, and that these measures are effective in mitigating or preventing impacts. The EO is therefore not required to be permanently present on site; • Monitor impacts upon the surrounding environment; • Act as liaison and advisor on all environmental and related issues; • Measure and communicate environmental performance of staff to the Contractor; • All environmental monitoring and reporting (Section 3); ○ Assist Contractor in incident management, investigation and reporting and reporting these to Contractor and ECO. ○ Can issue non-conformances to Contractors; ○ Undertake corrective actions, within the stipulated timeframes, where non-compliances occurred; ○ Maintain the relevant Registers as outlined in Section 3; ○ Summarise all findings of the above responsibilities in a weekly and in a monthly monitoring report during construction (Section 3) and a monthly report during operation; • Compile and maintain all documentation for submission to the ECO for their reporting; and • Conducting monitoring to ensure that project-related activities do not have an adverse effect on the local economy, the environment, or the health of workers and community members (See Sections 5, 6, and 7).

Function	Roles and Responsibilities
Independent Environmental Control Officer (ECO)	The ECO should be employed by the Developer. The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as a quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. The ECO should be employed for the duration of the project and under any conditions stipulated within the EA. The ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation, and be available to advise on incidental issues that arise. Site visits and reporting frequency should be done as stipulated in the EA or, if not stipulated in the EA, should be done at least monthly during construction and at least once per year during operation. The ECO is also required to conduct internal compliance audits, verifying the monitoring reports submitted by the Contractor's EO. The ECO provides feedback to the Developer and Contractor regarding all environmental matters. The Contractor's EO is answerable to the ECO for non-compliance with the specifications as set out in the EA and EMPr. Issues of non-compliance raised by the ECO, or to the ECO, must be taken up by the Developer, and resolved with the Contractor as per the conditions of their contract. The ECO must also report to the Competent Authority as and when required, in accordance with the EA. <u>Responsibilities:</u> • The responsibilities are similar to those of the Contractor's EO, with the key distinction that the ECO is an independent experienced party who also monitors and verifies the EO's reports and performance. • Be aware of the findings, conclusions and conditions of the EIA, EA, CWDP and any other Environmental Licences. • Be familiar with the recommendations and management outcomes and actions of this EMPr; • Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; • Preparing the reports to be submitted to the Developer (as per Section 3); • Reviewing all Method Statements prior to the commencement of activities (or as required); • Manage and monitor the implementation of the requirements stipulated in the EA, EMPr (this document), CWDP, and Method Statements by the Contractors and all staff on site, to ensure compliance with these documents. Further, refer to Sections 5, 6 and 7 for the specific Environmental Management Measures which must be implemented and monitored for compliance; • Undertake regular site inspections at the frequency stipulated in the EA. If the EA does not specify a frequency, inspections must be conducted at least once per month during construction and once per year during operation. • Must actively pursue opportunities to enhance environmental outcomes; • Tracking and reporting on environmental performance and compliance with the EA, EMPr, CWDP and any other applicable licenses, and compile results into an Auditing Report, at the frequency stipulated in the EA. If the EA does not specify a frequency, these audits and auditing reports must be conducted at least once per month during construction and once per year during operation. Brief monthly reports by the ECO must also be compiled during operation, based on the EOs monthly visits and reports (note, these internal audits are not the audits referred to in Section 34 and Appendix 7 of the EIA Regulations, 2014); • Ensuring that the requisite remedial actions are implemented in the event of non-compliance; • Calling for the restriction of activities affected an incident or non-compliance until remedial action has been taken; • Compiling and maintaining all documentation (the same as that required of the Contractor's EO), which may consist of a combination of the ECOs own records and those provided by the EO. • Educate the construction team about the management measures contained in the EMPr and environmental licenses;

Function	Roles and Responsibilities
	• In consultation with the Developer, order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; • Liaison between the Developer, Contractors, authorities and other lead stakeholders on all environmental concerns; • Checking all documentation compiled by the Contractor's EO; • Assisting in the resolution of conflicts; • In case of non-compliances, the ECO must first communicate this to the Contractor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; • Maintenance, update and review of the EMPr; • Communication of all modifications to the EMPr to the relevant stakeholders. • Further note, the ECOs function is not limited to the construction phase alone, but is also an active role during the operational and later phases of the project. • Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the ECO.
SHE Officer	The H&S or SHE officer can be appointed by either the Contractor or the Developer. This person can also be a direct employee of the Developer. The Contractor/ Developer must ensure that the H&S/ SHE officer is suitably qualified to perform the necessary tasks. This person is responsible for ensuring compliance of all contractors, subcontractors or any persons on site with H&S requirements outlined in this document, with the aim of ultimately assisting the Contractor and EO in overall compliance with the EA and EMPr. <u>Qualification Requirements</u> This person must, as a minimum, have the following qualifications and experience: • Be an appropriately qualified H&S/ SHE officer; • Have demonstrated and relevant H&S experience in the construction industry; • Be senior enough to have authority over all the contractors' staff working on-site; • Understand Compliance Reporting, and the implications of non-compliance; and • Be able to resolve conflicts and make recommendations on site, in terms of compliance with H&S requirements. <u>Responsibilities:</u> • Must be fully conversant with the conditions of the EA, the management outcomes and actions contained in this EMPr, and all applicable H&S legislation, and ensure that these requirements are effectively implemented on site. • Responsible for day-to-day monitoring and enforcement of compliance with H&S requirements by all personnel on site. Refer to Section 5, Section 6 and Section 7 for the specific management measures applicable to H&S that must be implemented and monitored. • Monitor and report on H&S compliance, incidents, non-compliances, and recommendations to the Contractor, EO and Developer. The EO retains overall responsibility for incorporating H&S information and compliance into reports and for

Function	Roles and Responsibilities
	coordinating reporting requirements, including non-conformance notices, incident investigations, corrective actions, and related documentation.
External Auditor	To be employed by the Developer. <u>Responsibility</u> • Conduct External Audit and prepare External Environmental Audit Report as per Section 34 and Appendix 7 of the EIA Regulations, 2014, at a frequently as determined by the EA or the EIA Regulations.

3 DOCUMENTATION, COMPLIANCE AND REPORTING

3.1 DOCUMENT CONTROL/ FILING SYSTEM

The completed EMPr must be signed and dated by both the contractor and the holder of the EA in Section 8 before the activity commences, and each page must be initialled. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

Once completed and signed, the Applicant must make this EMPr available to the public in accordance with regulation 26 (h) of the Environmental Impact Assessment Regulations, 2014. Copies of this EMPr must be stored in such a manner that it is accessible to all on site personnel, and must be distributed to all senior contract personnel, who are required to familiarise themselves with its contents.

To ensure accountable and demonstrated implementation of the EMPr, several reporting systems, documentation controls and compliance mechanisms must be in place. The holder of the EA is responsible for the management of an EMPr file in which all documentation detailed below must be filed. The EMPr file must be made available at all times on request by the CA or other relevant authorities.

The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations. The following documents must be placed in the EMPr filing system and be accessible at all times:

- 1) Signed EMPr, as well as any amendments thereof;
- 2) Signed EA from the Competent Authority (Attach as Annexure A);
- 3) Approved Site Layout Plan (Attach as Annexure B);
- 4) All Approved and signed Method Statements by Contractor(s)/ Sub-contractor(s) (Attach as Annexure C);
- 5) Minutes and attendance register of site meetings;
- 6) On-site Registers to be kept by Contractor's EO:
 - Incident Register
 - Waste Register
 - Weekly site inspection
 - Fauna & Flora Encounter Register
 - Complaints Register (from community)
 - Environmental Awareness Training Register
 - Non-conformance Register
- 7) Photographic record;
- 8) A copy of all corrective actions signed off;
- 9) Reports:
 - **Construction:**
 - Weekly Environmental Reports by the Contractor's EO, followed by a summarised Monthly Environmental Report (summary of weekly reports);
 - Monthly (or at a frequency stipulated in the EA) Internal Environmental Audit Reports by ECO;

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- **Operation:**
 - Monthly Environmental Reports by the Contractor's EO, followed by a summarised Annual Environmental Report (summary of monthly reports);
 - Brief monthly reports by the ECO based on the EO monthly visits and reports)
 - Annual (or at a frequency stipulated in the EA) Internal Environmental Audit Reports by ECO;
 - **External Environmental Audit Report:** As per Section 34 and Appendix 7 of the EIA Regulations, 2014 by an Independent External Auditor at a frequently as determined by the EA or the EIA Regulations.

3.2 METHOD STATEMENTS

A method statement is a written document that sets out in detail the materials, labour and methods for carrying out a specific activity; the measures that will be taken to minimise environmental impacts; and the way in which relevant management actions/mitigation measures in the EMPr must be implemented. It must be prepared by the Developer, Contractor, Sub-Contractor, or any party undertaking the task. It must be prepared in such detail that the Developer, EO and ECO are able to assess the Contractor's compliance with the EMPr.

Method Statements must be submitted by the Contractor or Subcontractors (as and when required), to the Developer and ECO, at least 14 days before the start of the activity to which the Method Statement applies, unless the ECO specifies otherwise. Method Statements are not required to be submitted to the CA.

If the method statement is deemed insufficient, it must be returned to the Contractor for revision and resubmission. Each accepted Method Statement must be signed and dated on each page by both the Contractor and Developer as a sign of commitment to following the agreed-upon methods. Signed Method Statements must be included in the EMPr file as Annexure C. Given that the Method Statement is a dynamic document, it may require regular updates in-line with actual implementation and any changing requirements.

Some management activities may overlap, which could also result in overlapping Method Statements. The ECO must confirm whether any of these Method Statements may be combined. Unless otherwise indicated by the ECO, the Contractor must provide the following Method Statements:

- EOs plan for Environmental Monitoring to ensure compliance with EA and EMPr;
- Environmental awareness training plan;
- Soil, Earthworks, Stockpiles, Erosion Management and Dust management plan;
- Storm water and run-off management plan during construction;
- Water use plan (source, abstraction and disposal for construction activities);
- Solid & liquid waste management plan (transport, storage, segregation, classification, disposal; all waste streams);
- Handling, transport and storage of Hazardous Chemical Substances;
- Fire control/ management plan;

- Vegetation management plan: In terms of clearing, felling, alien clearing in terms of the Invasive Alien Plant Management Plan, as well as disposal of removed vegetation, etc.;
- Search and Rescue of animal species prior to clearing to ensure that nests, small reptiles and mammals are moved out of the area.
- Fauna interaction and risk management plan during construction activities (e.g. encountering snakes or nests);
- Traffic management plan, including access roads;
- Heritage and palaeontology management: including a Palaeontological Fossil Chance Find Protocol and a Heritage Chance Finds Procedure (CFP);
- Social interaction management plant (communication and complaints);
- Construction camp and laydown area plan;
- Workshop, servicing and maintenance plan (construction phase);
- Routine inspection, maintenance and cleaning management plan (operational phase);
- Noise management plan;
- Rehabilitation plan (if applicable and for areas not within the identified impact footprint);
- Impact/ Aspect Register; and
- Site-specific Emergency preparedness and incident management plan.

Section 5, Section 6 and Section 7 outline the management actions and desired outcomes for the various aspects of the project (e.g., noise, fire, heritage management, etc) and should be used to guide the preparation and drafting of the method statements. The guideline methodology for preparing method statements have been included in Appendix 4.

3.3 ENVIRONMENTAL AWARENESS TRAINING

Environmental awareness training courses must be conducted for all personnel on site. All staff must be trained prior to starting work, and proof of training must be submitted to the ECO. The Contractor's EO must develop an awareness training program, which will be submitted to the ECO for approval. Training must be based on the information outlined in Section 5, Section 6 and Section 7 so as to ensure that the actions are implemented and outcomes achieved. Where appropriate, the EO must consult with the H&S/SHE Officer when preparing H&S-related training content, or the H&S/SHE Officer may deliver the H&S-specific component of the training.

The Contractor's EO will be responsible for managing and implementing the training program before the operational activities commence. All employees who spend more than one day per week, or four days per month on site, must attend the training. Two types of courses must be offered: one for Contractor and Subcontractor management, and one for all site staff and labourers. The training sessions must be held during normal working hours at a suitable venue provided by the Contractor. All attendees must remain for the full duration of the course, and sign an attendance register, which must be forwarded to the ECO. The Contractor must allow for sufficient training sessions to accommodate all personnel, including any new hires. The Contractor may be required to provide additional on-site training on any environmental aspects that are unclear to the personnel.

Every employee needs to undergo the following:

- A site-based induction before working on site;
- task-based learning and skills development;
- weekly toolbox talks;
- annual environmental induction refresher training sessions; and
- must be retrained based on the outcome(s) of corrective action (where relevant).

The following information must be included in the training register:

- Those trained;
- The date and time of the training;
- The trainer's name;
- A synopsis of the training's subject matter; and,
- The efficacy of training initiatives.

3.4 CORRECTIVE ACTION RECORDS

Corrective action is essential as it enables ongoing improvement. For each non-conformance notice issued, a documented corrective action must be recorded by the Contractor's EO, who must also formally notify the Contractor through a Corrective Action Request. The Contractors must take action to correct the matter as soon as possible, but no later than two weeks from the incident, or within a timeframe agreed with the Environmental Officer, depending on the nature of the incident.

The Corrective Action Request documents:

- The nature of the non-compliance/ environmental damage;
- The actions or outcomes required to correct the situation; and
- The date by which each corrective or preventive action must be completed.

On completion of the corrective action, the EO must issue a Corrective Action Report to the ECO. If satisfied that the corrective action has been completed satisfactorily, the ECO is to sign-off on the Corrective Action Report, which must be included with the non-conformance notice in the EMP file. A corrective action is considered complete once the report has been signed off by the ECO. The Contractor/ Developer must report in the external audit how the required actions were implemented, as well as the success or failure of the corrective action(s). Where repeated non-compliance is recorded, procedures may need to be altered accordingly to avoid the need for repeated corrective action.

3.5 PHOTOGRAPHIC RECORD

A digital photographic record must be kept. The photographic record must be used to show the progress of the work.

3.6 COMPLAINTS REGISTER

A complaints register should be kept by the EO/SHE Officer to record all complaints received from communities, stakeholders and individuals. All complaints received must be investigated and a response should be given to the complainant within two weeks of receipt of the complaint. The Complaints Register must:

- Record the name and contact details of the complainant;
- Record the time and date of the complaint;
- Contain a detailed description of the complaint;
- Where relevant and appropriate, contain photographic evidence of the complaint or damage; and
- Contain a copy of the EO/ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The EO/ECOs written response must include a description of any corrective action to be taken and must be signed by the Contractor, EO/ECOs and affected party.

3.7 ASPECTS, IMPACTS AND RISK ASSESSMENT

A detailed Environmental Aspect/ Impact Register, based on specific contractor methodologies and activities, must be developed and must be submitted to the Developer for approval prior to commencement of works. This register is intended to capture site-specific risks not fully defined during the BA process. An example template is provided in Appendix 5.

The assessment process includes four key steps:

- i. Identify all elements that could interact with the environment, considering factors such as environmental characteristics and sensitivity.
- ii. Evaluate the potential impacts of the activities, including their duration, intensity, and the extent to which they can be mitigated.
- iii. Rank the risks based on the likelihood of adverse impacts and the severity of consequences, using a 'worst-case scenario' as defined by the risk matrix of 'likelihood and consequence probability.'
- iv. Determine the level of mitigation required for each environmental aspect. Higher potential severity and greater consequences of unmanaged effects necessitate more rigorous environmental management.

3.8 EMERGENCY PREPAREDNESS AND INCIDENT MANAGEMENT

Prior to starting construction or operational activities, the Contractor must submit a site-specific Emergency Preparedness and Incident Management Plan (method statement) for approval by the Developer. This plan should be reviewed and updated annually. This plan will be based on the Aspects/ Impact register. As mentioned above, the Contractor must use an Impact/Aspect Risk register to identify potential environmental incidents on site and implement measures to prevent or mitigate their effects. The Emergency Preparedness and Incident Management Plan must ensure the following:

- Employees receive adequate training on incident management and emergency situations;

- Organisational details, including manpower, responsibilities, accountability, and liability of personnel, are documented;
- A list of key personnel with contact numbers is provided;
- Information on emergency services (e.g., fire department, spill clean-up services) is included;
- Internal and external communication plans, including reporting procedures, are outlined;
- Actions for different types of emergencies are detailed (such as protocols for preventing, containing, and reporting accidental spills);
- Procedures for incident recording, progress reporting, and remediation measures are established;
- Information on hazardous materials, their potential impacts, and measures for accidental release are provided; and
- Significant risks identified using the Impact/Aspect register are addressed.

3.8.1 EMERGENCY REPORT PROCEDURE

Effective risk management and emergency prevention are essential for all project activities. The implementation of the EMP focuses on anticipating, preventing, and mitigating foreseeable risks associated with the project. A key component of this risk management strategy is having pre-established plans to ensure prompt response, notification, and recovery in the event of an emergency.

The Contractor's Emergency Preparedness and Incident Management Plan must define the structure of emergency teams, communication processes, and necessary resources for managing emergencies. This plan should include:

- General responsibilities;
- Incident management and notification procedures;
- Event classification and notification protocols; and
- Resource and training requirements.

The objectives of the Emergency Preparedness and Incident Management Plan are to:

- Reduce risks to life, property, and the environment;
- Outline how an emergency response is triggered and how emergency teams are mobilised;
- Define command, control, and communication protocols between the Developer, ECO, the Contractor, and external response and government authorities;
- Specify the roles and responsibilities of all personnel involved in or present at the emergency site;
- Identify required emergency response equipment;
- Determine training requirements for response personnel; and
- Serve as the foundation for training all individuals who might be involved in emergency response.

The following key incident reporting contact numbers relevant to operational related activities must be included in the Emergency Preparedness and Incident Management Plan:

- Contractor/ Engineer Representative or Project/ Site Manager;

- Environmental Control Officer;
- Health, Safety and Environmental Officer;
- Contractor's Environmental Officer;
- Fire Department;
- Hospitals / clinics;
- South African Police Services (SAPS);
- Local Police Station;
- Emergency Medical Services (EMS) & Ambulance; and
- Spill response team.

3.8.2 ENVIRONMENTAL INCIDENTS

An environmental incident is defined as:

- Unplanned events with negative outcomes, which may include human injury, environmental damage, or asset loss;
- Near misses—extraordinary events that could have reasonably resulted in such incidents;
- Any deviation from the environmental management actions stipulated in this EMP, that may be addressed immediately by the EO/ ECO (for example, a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a Contractor which is in contravention of the environmental stipulations and guidelines listed in this EMP which, as a single event, would have a minor impact, however, if cumulative and continuous, would have a significant impact (i.e. no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

Incident Registers

All incidents that occur during the construction and operational phase must be recorded in an Incident Register by the EO. This register must be used to record all environmental incidents for which a non-conformance notice would not be issued. These incidents must be managed according to the Contractor's Emergency Preparedness and Incident Management Plan. The Contractor must address/ acknowledge the issue as soon as possible, but no later than one week from the incident, and also correct the issue as soon as possible, but no later than two weeks from the incident, or within a timeframe agreed with the Environmental Officer, depending on the nature of the incident. These incidents must be reported to the Contractor, Developer and ECO. The Log is to be kept in the EMP file. The Environmental Incident Log must be captured in the relevant Environmental Audit Report by the ECO. At a minimum, the following must be recorded for each environmental incident:

- The date, time, location and description of the incident;
- The cause of the incident;
- The type/ nature of incident;
- The name of the Contractor responsible;
- The impact/ significance of the Incident (minor or significant) and any associated risks (an assessment of both immediate and long-term effects);
- If the incident is listed as significant, a non-conformance notice must be issued, and recorded in the log;

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- Toxicity of the substances involved;
 - Details of any spillages, damages, injuries, or fatalities and the parties involved;
 - What remedial or corrective action was taken to mitigate the incident; and
 - Measures or corrective/ remedial action taken to mitigate or prevent the effects of the incident and avoid future occurrences; and
 - A record of repeat minor offences by the same contractor or staff member.

The following are examples of environmental incidents and near misses should be recorded in the incident register, including:

- Loss of containment incidents or releases of liquids, solids, or gases;
- Spills of dangerous goods or hazardous substances (regardless of volume or weight);
- Complaints from regulatory authorities;
- Regulatory breaches, including directives, fines, or breaches of authorisation/license conditions;
- Stakeholder complaints;
- Damage or loss to third-party property; and
- Unapproved loss or damage to significant flora and fauna.

3.9 NON-COMPLIANCE AND NON-CONFORMANCE REGISTER

Non-compliance refers to the failure of the Contractor or Developer to adhere to the requirements, conditions, or standards set out in the EMP (i.e., the management outcomes and actions), Environmental Authorisation, or relevant environmental legislation. This generally involves planned or ongoing activities that do not meet regulatory or procedural requirements, such as failing to follow dust suppression measures, using unapproved vehicles, or not implementing required mitigation measures. While some unplanned incidents with significant impacts could also be considered non-compliance, most cases relate to deviations from established procedures. In the case of non-compliance, a non-conformance notice must be issued in writing by the Contractor's EO to the responsible Contractor or person. This notice, which must contain the same information as the incident register, is used to log, track, and manage instances where requirements are not met. For each non-conformance notice, a documented corrective action must be recorded. The Contractor must address/ acknowledge the issue as soon as possible, but no later than one week from the non-compliance/ incident, and also correct the issue as soon as possible, but no later than two weeks from the incident, or within a timeframe agreed with the Environmental Officer, depending on the nature of the incident. Failure to comply shall be reported to the ECO. Any costs incurred by a Government Department or Municipality due to non-compliance with environmental legislation by the Developer will be charged to the Developer. Reporting will follow the same procedure as outlined for incident reporting.

Reporting of major environmental incidence/ non-compliances

Once an incident is stabilised and initial notifications/ non-conformance issued, a full investigation must be conducted, including corrective and preventive measures. A formal report, building on the non-conformance register, should detail the actions taken to remediate damage and prevent recurrence. This report must be submitted to the ECO

within two weeks after the investigation has been completed and within 4 weeks after the incident.

Non-compliances/ major environmental incidents that are reportable

Non-compliances/ major environmental incidents which are reportable include those that cause substantial environmental damage; or have a significant potential impact on the environment. Examples of reportable incidents are:

- Spills into watercourses, the estuarine or marine environment, or drains, as defined by relevant legislation;
- Loss of hydrocarbons or chemicals exceeding 20 litres on land;
- Spills or releases, including soil movement, that extend offsite and have a negative impact;
- Death or injury to livestock, wildlife, or any fauna caused by construction or operational activities;
- Disturbance of previously undetected culturally significant sites without proper approval;
- Transfer of known alien invasive species or diseases due to construction or operational activities;
- Fires;
- Traffic incidents;
- Damage to property outside the development area;
- Unresolved landowner disputes where no agreement can be reached;
- Incidents likely to generate regional or widespread negative publicity;
- Serious environmental damage or imminent risk of such damage;
- Significant environmental degradation, pollution, or non-compliance with the EA, this EMPr or other legislative requirements; and
- Exceedances of prescribed dust fall standards where dust monitoring is mandated.

3.10 MONITORING AND FREQUENCY OF MONITORING

Implementation of the requirements stipulated in the EA, EMPr (this document), Method Statements and the Coastal Waters Discharge Permit (CWDP) must be monitored throughout the project. The Contractor's EO and the ECO are responsible for assisting the Contractor and monitoring compliance by the Contractor and all site staff with these requirements. For certain management measures outlined in Sections 5, 6 and 7, specialist studies may have indicated examples of how compliance can be demonstrated (e.g. appointment records, contracts, monitoring records, photographs, or registers). Where this has not specifically been indicated, the Developer should consult with the Contractor's EO and ECO regarding appropriate proof of compliance. The form of proof required must be determined by the EO and ECO based on the nature of the management measure. The Contractor's EO must conduct weekly site inspections during the construction phase, to ensure and monitor the implementation of these requirements, and to ensure that the management actions and outcomes are appropriate for preventing or minimising impacts. The EO is therefore not required to be present on site every day. The ECO must undertake regular site inspections at the frequency stipulated in the EA. Where the EA does not specify a frequency, inspections must take place at least once per month during construction.

3.11 REPORTING AND AUDITING

Construction Phase

Weekly Reports by the Contractor's EO

The Contractor's EO must draft a weekly report where the findings from the weekly site inspections are summarised. The weekly report must be submitted to the relevant Contractor's manager to ensure effective corrections of findings. The weekly report must include the following information:

- An overview indicating the activities conducted during the past week, the highlights and lowlights of the week, current outstanding issues, concerns, and the environmental toolbox talk topics;
- Any Environmental Awareness Training conducted (Environmental Awareness Training Register);
- An overview of the site inspection findings;
- A detailed description, with quantities, of the waste generated on site during the week (Waste Register);
- An overview of the incidents that occurred (Incident Register);
- An overview of the complaints that were received from community/ other people (Complaints Register);
- An overview of any non-compliances (Non-Conformance Register);
- An overview of any corrective actions (Corrective Action Records);
- An overview of any Fauna that were encountered and/or removed from site (Fauna & Flora Encounter Register);
- An Overview of any Flora that were relocated and/or removed from site (Fauna & Flora Encounter Register);
- Photographic record of the above (where applicable); and
- An overview of findings with appropriate close out findings.

Monthly Reports by the Contractor's EO

The Contractor's EO must compile a monthly report that consolidates and summarises the findings of the weekly inspections and reports. This report provides an overview of monitoring outcomes for the reporting period and must be submitted to the ECO and the Developer. The monthly report must include:

- A summary of the weekly site inspections and reports for the reporting period (including the information specified for weekly reports);
- A summary of the work, tasks completed, and activities undertaken during the reporting period;
- A summary of any specific environmental actions or plans implemented (e.g. search and rescue operations);
- An overview of all audits undertaken during the reporting period (if applicable);
- An evaluation of Contractor and staff performance in terms of compliance with the EA, EMPr, Method Statements, and CWDP (as applicable); and
- A progress update on any reinstatement or rehabilitation activities.

Internal Environmental Audits and Audit Reporting by ECO

In addition to the Contractor's EO monitoring and reporting discussed above, comprehensive audits must be conducted to ascertain the effectiveness of the management strategies put in place to control and mitigate impacts. The ECO must undertake regular internal environmental audits of the Contractor and Developer's compliance with the EA, EMPr, CWDP, and any other applicable licences, and compile the results into an Audit Report, at the frequency stipulated in the EA. Where the EA does not specify a frequency, audits must be conducted at least once per month. These reports must be submitted to the Developer. The term internal audit is used here to distinguish these smaller, routine ECO audits from the formal audits required under Section 34 and Appendix 7 of the EIA Regulations, 2014.

The purpose of these internal audits is to provide continuous oversight, to ensure ongoing compliance by the Contractor and Developer, and to maintain regular reporting. These records will serve as the foundation for the formal audits required in terms of the EIA Regulations, therefore creating a comprehensive compliance record and reducing the burden on the appointed external auditor. The external auditor must therefore be given access to these reports.

These comprehensive internal audit reports must draw on both the ECOs own records and the information contained in the monthly EO reports. They must identify system flaws, instances of non-compliance, and any unfavourable (or potentially unfavourable) environmental conditions arising from project activities. These reports must also provide conclusions on contractor compliance and performance, their capacity to effectively avoid, manage, and mitigate environmental impacts, and the overall level of compliance with the EMPr and other regulatory requirements.

Annual Reports by the Contractor's EO

The Contractor's EO must compile an annual report that consolidates and summarises the findings of the monthly inspections and reports. This report provides an overview of monitoring outcomes for the reporting period and must be submitted to the ECO and the Developer. The report will include the same information as the monthly report during the construction phase.

Internal Environmental Audits and Audit Reporting by ECO

The ECO must undertake environmental audits of the Contractor and Developer's compliance with the EA, EMPr, CWDP, and any other applicable licences, and compile the results into an Audit Report, at the frequency stipulated in EA. Where the EA does not specify a frequency, audits must be conducted at least once per year. These reports will be submitted to the Developer. Note that brief monthly reports by the ECO must also be compiled during operation (based on the EOs monthly visits and reports).

Operational Phase***Monthly Reports by the Contractor's EO***

The Contractor's EO must draft a monthly report where the findings from the monthly site inspections are summarised. The report will be submitted to the relevant Contractor's

manager to ensure effective corrections of findings. The report will include the same information as the weekly report during the construction phase.

External Environmental Audits (Section 34 and Appendix 7 of the EIA Regulations, 2014)

In terms of Section 34 of the EIA Regulations, 2014 (as amended), the Developer's compliance with the conditions of the EA and EMPr must be audited by an independent external auditor, as specified in the EA. These audits are mandatory once an EA has been issued, and for as long as the EA/ EMPr remains valid. The frequency of audits must align with the intervals specified in the EA or, where not specified, with the requirements of Section 34 of the EIA Regulations, which states at least once per 5 years. The findings must be documented in an Environmental Audit Report, which is submitted to the Competent Authority for acceptance. All audit reports must comply with the requirements of Section 34 and include the information specified in Appendix 7 of the EIA Regulations, 2014.

The reporting timeframes for the various required reports are provided in Table 3.1.

Table 3.1. Reporting timeframes for the various reports required throughout the project's life cycle.

Report	Timing	Prepared by	Reviewed by
Construction Phase			
Weekly EO Reports	Weekly	EO	Contract Manager & ECO
Monthly EO Reports	Monthly	EO	ECO & Developer
Internal Audit Reports	Monthly (or as specified within the EA)	ECO	Developer & Competent Authority
Operational Phase			
Monthly EO Reports	Monthly	EO	Contract Manager & ECO
Annual EO Reports	Annually	EO	ECO & Developer
Brief Monthly Reports	Monthly (or as specified within the EA)	ECO	Developer & Competent Authority
Internal Audit Report	Annually (or as specified within the EA)	ECO	Developer & Competent Authority
External Audit			
External Audit Report	At least once per 5 years, as specified within the EA.	External Auditor	Competent Authority
General			
Grievance	Within two weeks of grievance	EO	ECO
Incident and Non-Compliance Reporting	Within two weeks after the investigation has been completed and within 4 weeks after the incident.	EO	ECO
Management Review	Within two weeks of management review	Contractors Senior Management	ECO
Change Management	Whenever required	EO/ ECO	Developer

3.12 AMENDMENTS TO THE IMPACT MANAGEMENT OUTCOMES AND ACTIONS

Once the activity has commenced, the holder of an EA may make amendments to the impact management outcomes and actions in the following manner:

- Amendment of the impact management outcomes – in line with regulation 37 of the EIA Regulation, 2014
- Amendment of the impact management actions – in line with regulation 36 of the EIA Regulations, 2014

3.13 QUALITY CONTROL SYSTEM

Every environmental and social monitoring project must adhere to recognised monitoring guidelines, conventions, and standards and must take baseline study results into consideration. As such, an integrated management system (IMS) consisting of an environmental management system based on ISO 14001 and a quality management system (QMS) based on ISO 9001 must be developed and maintained by the Contractor's EO, in consultation with the ECO.

All sample analysis must be completed at a laboratory accredited by SANAS 17025, unless otherwise indicated in the contractor's method statement and authorized by ECO.

In addition, the Contractor must provide comprehensive terms of reference for the selection of a professional service provider to carry out the environmental monitoring program for marine and estuarine ecological receptors, and the quality of the water and sediment. The professional service provider shall meet minimum professional requirements for:

- qualifications;
- professional registrations;
- experience and track record;
- demonstrated proficiency in use of relevant monitoring and sampling equipment;
- equipment requirements and tolerances for detection limits;
- reporting and analysis; and
- confirmation of laboratory accreditation, capacity, delivery and performance within reasonable timeframes.

4 PROJECT BACKGROUND, LOCATION AND DESCRIPTION

4.1 DETAILS OF THE APPLICANT

Name of applicant: Transnet SOC Limited—Division Transnet National Ports Authority (TNPA)—East London Port.

Name of contact person for applicant: Nosicelo Biyana

Tel No: 067 367 0110

Postal Address: Postal address P O Box 101, East London, 5200

Physical Address: Hely Hutchinson Rd, Quigney, East London, 5211

Email Address: Nosicelo.Biyana@transnet.net

4.2 DETAILS AND EXPERTISE OF THE EAP

Name of EAP: Ms Cheruscha Swart

Tel No: 021 701 3420

E-mail address: cheruscha@anchorenvironmental.co.za

Company: Anchor Environmental Consultants (Pty) Ltd.

Expertise of the EAP (Curriculum Vitae included):

- MSc (Cum Laude) Zoology; BSc (Hons) & BSc Biodiversity and Ecology
- EAPASA (Reg EAP no. 2021/3298)
- SACNASP Pr.Sci.Nat. Reg: 155305 (Environmental Science; Zoological Science)

A full professional CV have been appended to this Report, as Appendix 1.

4.3 PROJECT TITLE

Scoping & Environmental Impact Assessment (S&EIA) for the Proposed 2MLD Solar Powered Seawater Desalination Plant in the Port of East London, Buffalo City Metropolitan Municipality, Eastern Cape Province, by Transnet National Ports Authority

4.4 PROJECT BACKGROUND AND LOCATION

Transnet SOC Ltd (through its division Transnet National Ports Authority (TNPA)) applied for Environmental Authorisation (EA) for the construction and operation of a reverse osmosis (RO) desalination plant with the purpose of producing fresh potable water from saltwater, which has been abstracted from the estuarine/ marine environment. The development is situated within the Port of East London, in the Buffalo City Metropolitan Municipality, Eastern Cape Province (Table 4.1, Figure 4.1). Refer to Annexure B for the Approved site plan and Appendix 3 for coordinates of each component of the

development. Since the facility will discharge brine into the marine environment, a Coastal Waters Discharge Permit (CWDP) has also been obtained.

Table 4.1. General site information: Erven (Erf) numbers, Surveyor General 21 (SG21) codes and physical location of the development.

PHYSICAL LOCATION	
Province	Eastern Cape Province
Municipality	Buffalo City Metropolitan Municipality
City/ Town	East London
Area/ suburb	Harbour, Port of East London
Postal Code	5201
Ward Number:	Ward 19
Zoning	Transport Zone 1
ERVEN	SG21 ID
63584	C02300040006358400000
38530	C02300040003853000000
63586	C02300040006358600000

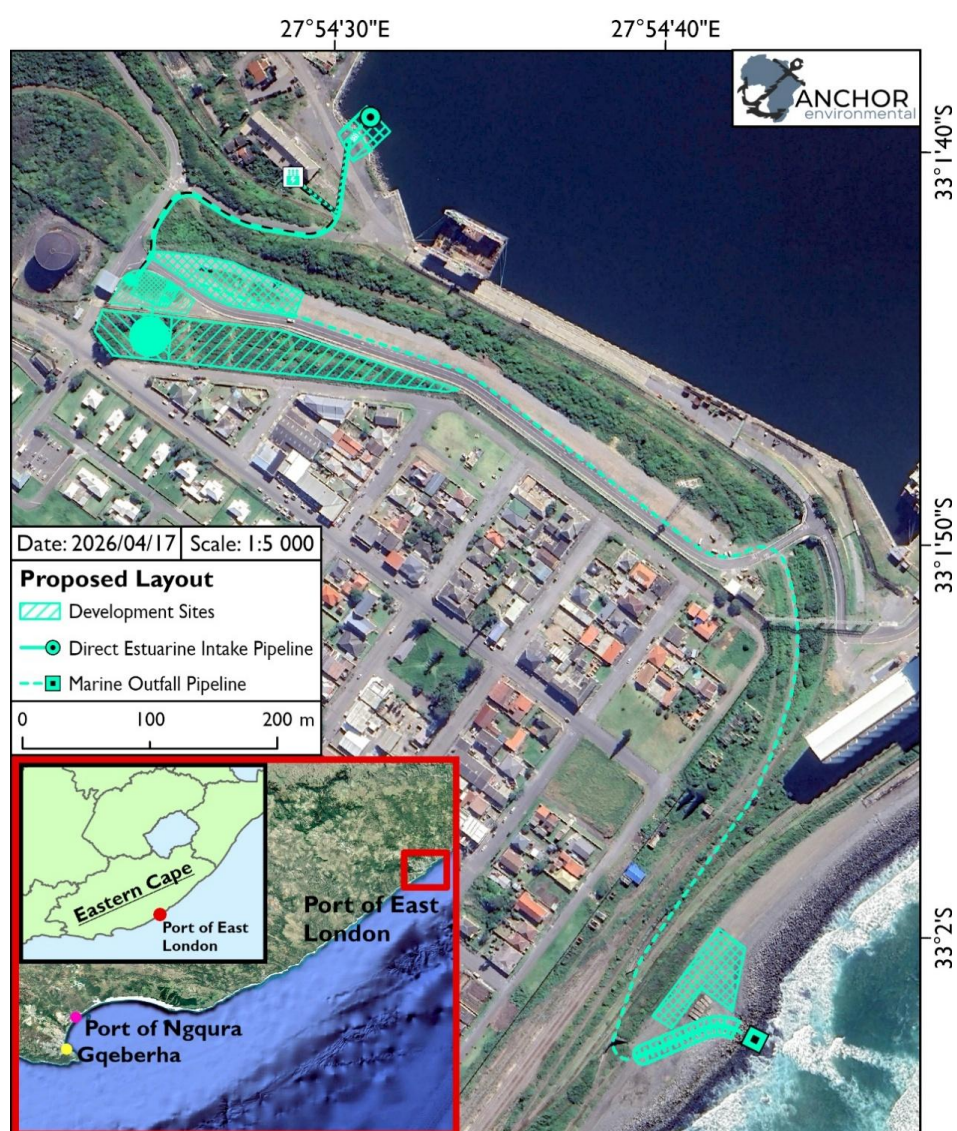


Figure 4.1. Location of the development in the Port of East London, Eastern Cape Coastline, South Africa.

4.5 BRIEF PROJECT OVERVIEW

Saline water is abstracted daily from the Buffalo River Estuary and treated at a reverse osmosis (RO) desalination plant to produce potable water (freshwater) that complies with the requirements of SANS 241. At full capacity, approximately 5 500 m³ (5.5 Megalitres (ML)) of saline water is abstracted daily, producing up to 2 000 m³ of potable water per day (2 MLD). The treated water is stored in a 1 000 m³ (1 ML) freshwater reservoir.

This water supports port operations and reduces dependence on municipal water supplies. The desalination plant is powered by a hybrid system that uses both solar energy and municipal grid electricity with the former being primary. When more electricity is generated than needed, batteries may be used to store excess electricity in containers housed at the RO plant site. Brine, a by-product of desalination with elevated salt concentrations, is discharged via a pipeline to a marine outfall where rapid dilution with ocean water occurs. It should be noted that brine is classified as effluent and may contain traces of chemicals used during the desalination process (such as cleaning agents and anti-scalants), but at highly periodic and very dilute concentrations.

The total development construction phase disturbance footprint was estimated to be approximately 25 162 m² (which included a buffer corridor for linear infrastructure). However, the permanent operational footprint is smaller.

The main project components are outlined below, with their locations depicted in Figure 4.2 and Figure 4.3. The spatial extent of each component, or lengths in the case of linear infrastructure such as pipelines and electrical cable lines, is provided in Table 4.2.

The main project components are as follows:

- **Water Intake Site/ associated structures and buildings:**
 - Direct intake and pipeline:
 - For water abstraction from the Buffalo River Estuary: Stretches from intake point in estuary to raw water holding tank at the RO plant site.
 - Intake point in the estuary: Approximately ~13–18 m from the edge of existing wall and 1 m below surface
 - Pipe made from High-Density Polyethylene (HDPE); Diameter: 315 mm.
 - Intake head will include a strainer barrier to prevent fish and other organisms from being drawn into the pipe.
 - Pontoon system linked to the pump house and extends to the estuary intake: A floating platform that supports the pipeline and accommodates the intake structure within the estuary.
 - Parking area.
 - Pump house building and foundation.
- **Desalination Plant Site:**
 - RO Desalination plant building which includes (list not extensive):
 - General storage room;
 - Restrooms;
 - Control/operations room with switchboard and computers;
 - Feed pumps and pre-treatment filters;

-
- A chemical storage room/container for Clean-in-place (CIP) and pre-treatment chemicals;
 - Battery storage container (batteries only potentially required to store excess electricity, if generated by the solar plant).
 - Reverse osmosis pumps and energy recovery devices; and
 - Two trains of RO membranes.
 - A 60 m³ brine holding/storage tank (brine “treatment” tank).
 - A 80 m³ ultrafiltration tank.
 - A 200 m³ raw water holding tank.
 - Permeate pipeline: Pipeline that transports desalinated freshwater from the RO plant to reservoir.
 - Vehicle Access and Parking area
 - Mini substation/ Transformer: Situated next to RO plant building close to Motor Control Centre housed inside. Connected to proposed 11kV cable line, which connects to the existing substation near the intake.
 - Freshwater production will gradually be scaled up as project progresses:
 - Initial phase: The plant will produce 500 m³ (0.5MLD) of freshwater per day.
 - Full Capacity: The plant will produce 2 000 m³ of freshwater per day (2MLD).
 - **Solar Plant Site:**
 - 1000 m³ (1 ML) freshwater reservoir and booster pumps.
 - Solar panels and foundations. Estimated output of 525 kWp (kilowatt peak), generating direct current (DC) at up to 1 kV supplied directly to RO plant.
 - **Marine Outfall Site/ Infrastructure:**
 - Brine discharge pipeline passing over breakwater
 - Internal Diameter: 200 mm; Outlet diameter: 150 mm
 - **Municipal Grid Connection:**
 - New low-voltage cable line from existing substation to intake pump house. Will power the pumphouse with electricity from the grid (will distribute 230-400V)
 - New 11 kV underground cable line line: Will run from existing substation to RO plant to supply power for specific low-voltage components and to supply backup electricity when needed (will distribute 11kV). Connects to newly installed mini substation/ transformer next to RO plant building. Will be installed instead of the previously proposed overhead electrical transmission line.
 - **Site Camps:**
 - Across the road from the desalination plant on a disturbed parking/ gravel area.
 - Close to the marine outfall next to the port breakwater.

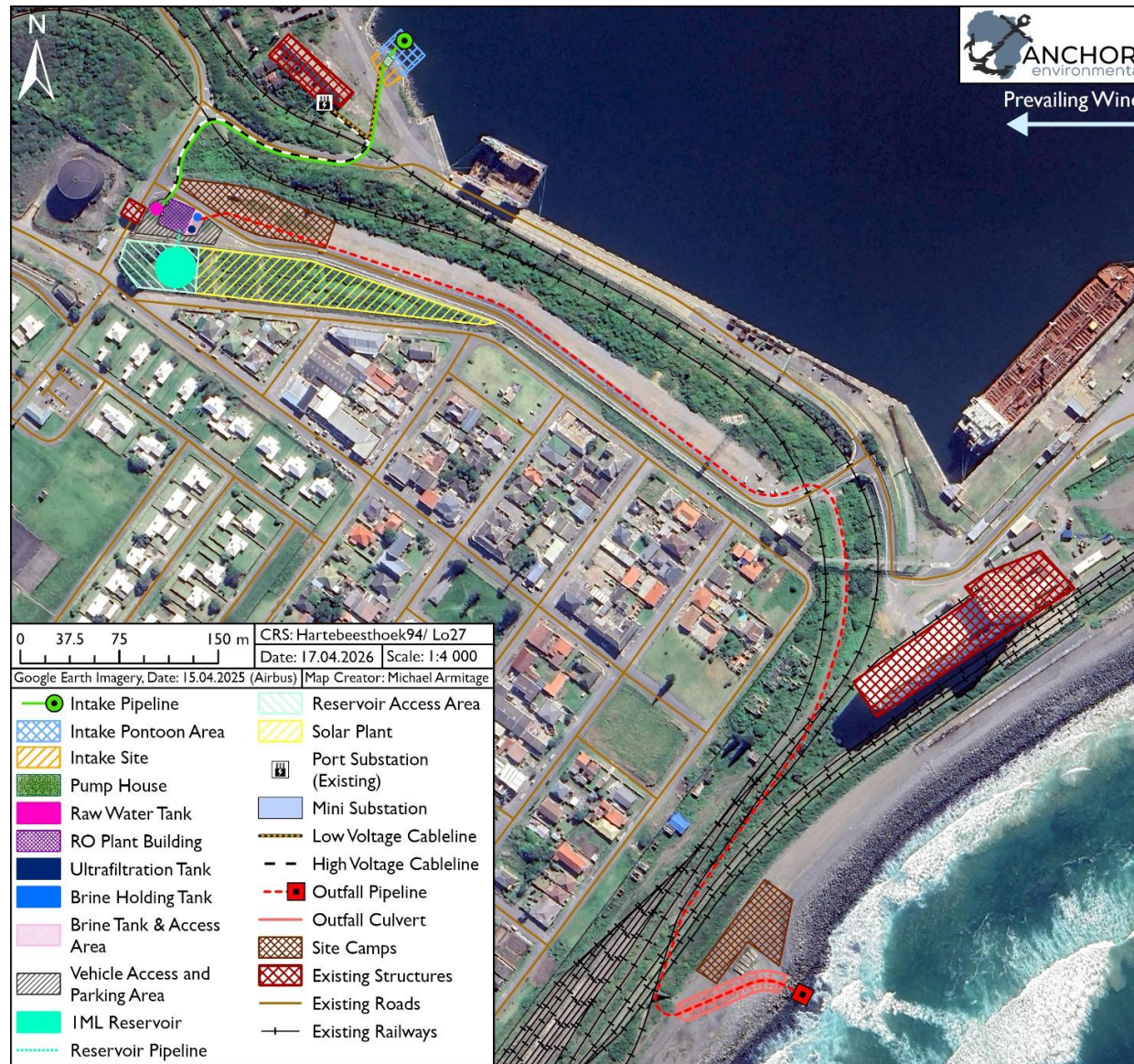


Figure 4.2. Development layout for the Solar & RO Desalination Plant and Intake and Outfall Pipelines and associated Infrastructure/ Structures.



Figure 4.3. The intake, RO Plant, Solar Plant, and all supporting infrastructure.

Table 4.2. Technical details and dimensions of the main project components for the proposed development. For linear infrastructure, the footprint of the intake pipeline and electrical cables assumes a corridor width of 4 m to accommodate trenching and associated disturbance, while the outfall pipeline footprint assumes a corridor width of 8 m.

Component	Description/ Dimensions
Location of the site	Ward 19 Buffalo City Metropolitan Municipality East London Harbour Port of East London
Urban Edge	Entire development in the urban edge, except for section of outfall pipeline extending beyond high-water mark into marine environment
Coastal Public Property	Not situated in delineated CPP
Total disturbance footprint	Footprint: ~25 162 m²
Water abstraction	Maximum abstraction: 5 500 cubic metres
Water Discharge (via marine outfall)	Maximum discharge: 3300 cubic metres a day (at full capacity of 2 000 m ³ /day freshwater production) Initial Discharge: 815 cubic metres per day (at initial phase of ±500 m ³ /day freshwater production)
Freshwater Production	Maximum Production: 2000 cubic meters
Type of renewable energy	Solar PV
Maximum generation capacity for solar plant	Estimated output of 525 kWp (kilowatt peak), generating direct current (DC) at up to 1 kV supplied directly to RO plant.
Water Intake Site/ associated structures/ buildings and intake pipeline	Total Footprint: 1 391m² (land-based section only)
<u>Intake Site (on land)</u>	Footprint: ~340 m²
Intake site minus pumphouse	Footprint: ~298 m²
Pumphouse building (including surrounding concrete foundation)	Footprint: 42 m² Dimensions: 6 x 7 m
<u>Pipeline from estuary intake point to RO Plant (land portion only)</u>	Pipe material: HDPE Water: Transports saline water from estuary Footprint (m²—minus intake site portions): ~1 051 m² Footprint from RO plant to Pumphouse Building (m²): 1111 m² Lenth (m): ~290m total (of which ~13–18 m will be between the intake and existing wall) Diameter: 315 mm Peak Throughput: Approximately. 63 l/s Intake velocity: Will not exceed 0.15 m/s along the entire intake strainer area (to comply with best practice).
<u>Estuary Intake Area and pontoon system</u> (not included in total footprint calculation)	Estuary Intake area in which pontoon will float: Footprint (m²): ~576 m²

Component	Description/ Dimensions
	• Pontoon System: ○ Footprint (m²): ~91 m² (note this is not a solid structure and floats on water) ○ Dimensions (m): 4.9m x 18.5m
Desalination plant site	Total Footprint: ~1 442 m²
<u>RO Desalination Plant Building Dimensions (including foundation and stone walkway surrounding building)</u>	• Footprint: 528 m² • Dimensions: 24 x 22m
• Chemical storage room: CIP and pre-treatment chemicals	• Capacity: 85 m³
• Battery storage container (future consideration)	• Capacity: 32.6 m³
• Mini substation/ Transformer:	• Footprint: 4.5 m² • Dimensions: 1.5 x 3 m
<u>Vehicle Access and Parking Area</u>	• Footprint: 756 m²
• Raw Water Holding Tank	• Footprint: ~63.6 m² • Diameter: 9 m • Capacity: 200 m³
<u>Brine and UF Tank and Access Area</u>	• Footprint: 159 m²
• Brine storage/ treatment Tank	• Footprint: ~19.6 m² • Diameter: 5 m • Capacity: 60 m³
• Ultrafiltration (UF) Tank	• Footprint: ~28.3 m² • Diameter: 6 m • Capacity: 80 m³
Solar Plant Site	Site Footprint: ~5 505 m²
Reservoir Site	Site Footprint: ~1 883 m²
<u>Freshwater Reservoir</u>	• Footprint: ~707 m² • Diameter: 30 m • Capacity: 1 ML (1 million litres)
<u>Reservoir Access Area</u>	• Footprint: ~1176 m²
<u>Permeate Pipeline: transports desalinated freshwater from the RO plant to reservoir</u>	• Pipe material: HDPE • Water: Desalinated potable water • Footprint (m²): ~61.6 m² (of which 8.3 m² falls within Reservoir Site) • Lenth (m): ~15.4 m (of which 2.1 m falls within Reservoir Site).
Marine Outfall Pipeline and associated structures	Total Footprint: ~10 240 m² Total Pipeline Length: ~1 093 m
<u>Pipeline from brine storage tank to outfall culvert</u>	• Pipe material: HDPE material • Footprint (m²): ~7 881 m² • Lenth (m): ~995 m • Internal Diameter: 200 mm • Outlet diameter: 150 mm • Peak Throughput: Maximum approximately 38 l/s
<u>Culvert + Outfall Revetment Section</u>	• Culvert Material: Predominantly Concrete • Footprint (m²): ~2 359 m²

Component	Description/ Dimensions
	Length: ~98.5 m
Municipal Grid Connection:	Total footprint: 1 251 m²
New low-voltage cable line: from existing substation to intake pump house.	Length: 102 m Footprint (m²): ~408 m ² (note: there is considerable overlap between this footprint and that of the Medium Voltage Cable Line, as well as the intake pipeline) Volts to be distributed: 230-400 V
New medium-voltage underground cable line: From existing substation to newly installed mini substation next to RO plant building.	Length: 253 m Footprint (m²): 1011m ² (note: there is considerable overlap between this footprint and that of the low-voltage underground cable line, as well as the intake pipeline). Kilovolts to be distributed: 11 kV For supplying grid electricity to the RO plant: Certain low-voltage components at the RO plant, such as lights, will rely exclusively on grid electricity. In addition, if solar power is not enough, electricity will be drawn from the municipal grid at up to 400 V.
Site Camps	Total Footprint: 5 265 m²
Site Camp A: RO and Desal plant	Site Footprint: 2 859m ²
Site Camp B: Marine outfall	Site Footprint: 2 406 m ²

4.6 ROUTINE INSPECTION, MAINTENANCE AND CLEANING

Routine inspection and cleaning of intake strainers

A visual inspection of the intake must be performed daily. Should the intake strainers need to be cleaned due to blockage, either of the following approaches must be followed:

- If the component is removable, the component must be removed and mechanically (scrubbing and or pressure hosing) cleaned on land.
- Non removable components must be cleaned mechanically (scrubbing and/or pressure hosing) either by trained personnel on the pontoon, or by a team of divers.
- The removed debris must be disposed of as appropriate for the type of waste.

Routine inspection and maintenance of the intake pipelines

The intake system has a chlorine dosing system which helps to minimise marine growth within the intake pipeline. Further mechanical cleaning of the intake pipeline must be performed either by pipeline pigging, or the removal of discrete pipeline segments to be replaced or cleaned in a suitable workshop or area.

Routine inspection and maintenance of the outfall pipelines

Mechanical cleaning of the outfall pipeline must be performed either by pipeline pigging, or the removal of discrete pipeline segments to be replaced or cleaned in a suitable workshop or area.

Other equipment and components

Other equipment and components such as storage tanks and electrical equipment, amongst others, must regularly be inspected for any weaknesses/damage. These must be repaired/ replaced as and when needed.

Waste management from filter backwash and chemical cleaning processes

Backwash and the periodic CIP flush (occurring once every 3–6 months), is first collected in a sump within the desalination building. Hereafter it goes to the brine tank for mixing with brine (allowing dilution), natural aeration and finally gets discharged into the ocean with the brine.

4.7 EFFLUENT DISCHARGE MANAGEMENT AND COMPLIANCE WITH COASTAL WATERS DISCHARGE PERMIT

Effluent discharged must meet the end-of-pipe concentrations modelled in the Marine Specialist Study and comply with all conditions of the CWDP. In addition, and in assisting with achieving this, the following requirements must be complied with:

- a) Ensuring aeration of the effluent prior to discharge when oxygen scavengers (such as sodium metabisulphite) are used.
- b) Ensuring the neutralisation of extremely alkaline or acidic solutions and the treatment of additional cleaning agents prior to discharge.
- c) Ensuring the continual release of small volumes of chemicals used during the CIP process with the brine stream to allow for maximum dilution before entering the environment.
- d) Ensuring adequate hydraulic mixing and dilution of brine.

The above can be met using a brine holding tank, which would act as an effective treatment and conditioning system. Within the tank, natural aeration, hydraulic mixing, dilution, neutralisation and pH equalisation would occur as part of normal operation. If the tank is installed, no additional chemical dosing or mechanical aeration is required unless indicated by monitoring results. Dosing levels must be adjusted if adverse effects are detected through the monitoring programme.

Ongoing environmental monitoring is required during operation, to ensure that the desalination plant's brine discharge (end-of-pipe concentrations) complies with the conditions of the CWDP and to detect and manage any potential environmental impacts over the life of the plant.

Monitoring requirements, including the frequency of monitoring and the specific parameters to be measured, are set out in the CWDP. These requirements will apply for the full operational life of the plant.

This involves both point source measurements (for example Conductivity, Temperature and Depth (CTD) profiling of the water in line with ongoing environmental monitoring requirements) and continuous water quality monitoring through deployment of a suitable instrument, which measures specific parameters, at the edge of the Recommended Mixing Zone (RMZ) to measure compliance with permitted discharge limits and parameters.

It also includes collecting sediment and biotic samples at the edge of the RMZ to assess sediment characteristics and benthic macrofaunal communities. Monitoring data must be compared to the baseline data collected as part of the Marine Specialist Assessment to determine impact over time. The results will provide an ongoing assessment of the influence of the outfall structure and brine discharge on biodiversity and ecosystem health.

4.8 ENVIRONMENTAL SENSITIVITY MAPPING, BUFFERS AND NO-GO AREAS.

The S&EIA process did not identify the need for any specific No-Go areas or buffer zones (areas around sensitive receptors where works must not occur). However, project activities should only occur within the designated development footprint. All sensitivity maps have been included in Appendix 2.

5 PLANNING AND DESIGN AND PRE-CONSTRUCTION ENVIRONMENTAL MANAGEMENT MEASURES

5.1 OVERVIEW

The holder of the EA and the Contractor are reminded that their compliance with Sections 5, 6 and 7 will be subject to monitoring and auditing, which must be carried out in accordance with Sections 3.9 and 3.10, and using the information and guidance provided in Section 2 and Section 3.

5.2 BASELINE PHOTOGRAPHY

Impact management outcome: Maintain a clear record of the site's pre-construction condition and any environmental changes or incidents using photographic record.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) The Contractor must photograph all areas to be affected by construction, including surroundings, work areas, site setup and laydown areas, access roads, gates, no-go and natural areas, debris, boundary fences, and existing structures/infrastructure. Any existing defects or issues must be captured. Photos must be provided to the Developer and made available to the EO and ECO for reporting.	Contractor/ Contractors EO	During planning phase prior to any work commencing

5.3 NOTIFY INTERESTED AND AFFECTED PARTIES (I&APs) OF COMMENCEMENT OF CONSTRUCTION

Impact management outcome: Notify all registered and relevant I&APs of the commencement of the project and construction activities to allow increased stakeholder awareness and transparency, allowing affected parties to anticipate and respond to construction activities.		
Essential Management/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) The Developer must notify the following I&APs of the availability of the signed EMPr and the commencement of construction. i. Registered I&APs, including the local municipality. ii. The local Fire Protection Agency (FPA). The details of the Contractor/ EO and ECO must also be shared with them. iii. The South African Heritage Resources Agency (SAHRA) and Eastern Cape Provincial Heritage Resources Authority (ECPHRA).	Developer	As soon as EMPr is signed and prior to the start of construction/ As per legislated timeframe

5.4 PIPELINES, INTAKE, AND OUTFALL DESIGN AND PLACEMENT

Impact management outcome: Reduce environmental impacts on surrounding habitats and species due to disturbances, increased turbidity and sedimentation, increase salinity, and potential injury of displacement, through appropriate intake and outfall design and placement.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
General a) Intake and Outfall structures should be positioned away from sensitive environments or areas with high species diversity or abundance (e.g. rocky reefs). b) Corrosion resistant materials should be used. Intake design and placement c) Intake should be designed so that intake velocities remain below 0.15 m/s to ensure that fish and other mobile organisms can escape the intake current. d) Intake must have a strainer barrier to prevent entrainment of fish and other animals. e) Intake should be installed in a manner that ensures that water is not drawn from the upper or the bottom one meter of the water column. f) Intake should be placed to ensure the horizontal intake of water. Outfall design and placement g) The outfall pipeline design and location should be as such to ensure that effluent discharge meets end of pipe concentrations modelled in the Marine Specialist Study and thereby complies with conditions in the Coastal Waters Discharge Permit (CWDP); h) The desalination plant should be designed to ensure aeration of the effluent prior to discharge if oxygen scavengers (such as sodium metabisulphite) are utilised. i) The desalination plant should be designed to ensure neutralization of extremely alkaline or acidic solutions and treatment of additional cleaning agents prior to discharge. j) The desalination plant should be designed to ensure the continual release of small volumes of chemicals used during the Clean-in-Place (CIP) process with the brine discharge to allow for maximum dilution before release into the environment. k) The above effluent requirements can be achieved through the installation of a brine holding tank, which would act as an effective treatment and conditioning system. Within the tank, natural aeration, hydraulic mixing, dilution, neutralisation and pH equalisation would occur as part of normal operation. Should the tank be installed, no additional chemical dosing or mechanical aeration is required, unless monitoring indicates otherwise.	Engineers/ Contractor	During planning phase prior to construction work commencing

5.5 VISUAL CONSIDERATIONS

Impact Management Outcome: Minimise visual impacts emanating from light reflections off solar panels/ buildings and disruption to the general visual landscape, through appropriate design controls and solar panel material selection.			
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation	of
a) Non-reflecting (matt)/ scattering solar panels must be used, in order to reduce the potential harm or disturbance associated with sunlight reflecting off the panels. b) If possible, neutral/ earth colours should be used for buildings, so as not to overly reflect sunlight and cause disturbance/ harm to observers. This will also help to preserve the overall character and sense of place of the area.	Engineers/ Contractor	During planning phase to ensure ongoing compliance during operation	

5.6 CAMP AND LAYDOWN AREA SITE ESTABLISHMENT

Impact management outcome: Minimise unnecessary disturbance or destruction of vegetation and disruption of the visual landscape, due to the establishment of site camps and laydown areas.			
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation	
Camp And Laydown Area Site Establishment a) A method statement must be provided by the Contractor prior to any onsite activity that requires a site camp or laydown area. This must include a layout plan for the camp/laydown area, indicating the location of key infrastructure and services (where applicable), including but (not limited to): offices; overnight vehicle parking; areas; stores; workshop(s); stockpile(s) and lay down areas; hazardous materials storage areas (including fuels); batching plant(s) (if any are located within the construction camp); designated access routes; equipment cleaning areas; placement of staff accommodation (if relevant); cooking and ablution facilities; and waste and wastewater management. b) Location of camp/s and any project activities must be within approved area (development footprint) to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; c) Sites should be located where possible on previously disturbed areas; d) The site design should consider the ease of delivery access, future construction needs, and the security concerns of neighbours, whilst also minimising disturbances. e) The Contractor shall construct and maintain fences of the type and in the locations specified by the developer (should they be necessary). These should be installed prior to commencement of works. f) Although the S&EIA process did not identify the need for any specific No-Go areas or buffer zones, the EA may specify such areas. Should such areas be identified, the Contractor must set up No-Go area demarcation fencing—prior to the commencement of any construction in the vicinity of one of these areas—and ensure that no equipment or material is allowed to enter; be piled, dumped, or stored in any of these designated without first receiving permission.	Engineer/ Contractors	During planning phase prior to construction work commencing	

5.7 ARCHAEOLOGICAL, CULTURAL HERITAGE, AND PALAEOLOGICAL RESOURCES MANAGEMENT

Impact management outcome: Minimise impacts associated with damage to/loss of/destruction of heritage resources, and enhance the preservation of heritage resources.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) The Developer must notify the South African Heritage Resources Agency (SAHRA) and Eastern Cape Provincial Heritage Resources Authority (ECPHRA) of the date of commencement of the project and/or share the project schedule and share the Environmental Authorisation (EA), prior to project commencement. b) The Developer must submit a detailed heritage chance finds procedure, and Palaeontological Chance Find Protocol for ECPHRA, and SAHRA, to approve before development starts. c) Heritage induction and training for ground crew (including the ECO) must be conducted, in identifying heritage resources. a) Shipwrecks/ shipwreck remains are generally large and visible on the seabed and therefore measures must be taken in advance of installation activities to avoid the site or material. b) A palaeontologist must be on site, to monitor, during excavations c) Heritage monitoring and reports to be shared with ECPHRA. d) Any wreck or related artefacts identified during any pre-construction ground-truthing of the marine outfall site must be flagged and reported to a suitably qualified maritime archaeologist, and SAHRA and ECPHRA notified.	Contractor/ Contractors EO/ Heritage Specialist/ ECPHRA/ SAHRA	During planning phase and prior to construction work commencing

6 CONSTRUCTION ENVIRONMENTAL MANAGEMENT MEASURES

6.1 OVERVIEW

The following section outlines the various aspects that need to be managed, along with the management outcomes and associated management actions that must be implemented during the construction phase to manage and mitigate potential impacts of the development on various receptors.

The holder of the EA and the Contractor are reminded that their compliance with Sections 5, 6 and 7 will be subject to monitoring and auditing, which must be carried out in accordance with Sections 3.9 and 3.10, and using the information and guidance provided in Section 2 and Section 3.

6.2 ENVIRONMENTAL TRAINING

Impact management outcome: Provide environmental awareness training to ensure all onsite staff are aware and understands the individual responsibilities in terms of this EMPr to ensure effective implementation and compliance.

Essential Management Actions/Mitigation Measures (Method of implementation)	Person responsible for Implementation	Timeframe of Implementation
a) To be Implemented as per the Environmental Training Method Statement.	Contractor/ Contractors EO/ ECO	Prior to working on site and a refresher course every six-months thereafter.
b) All staff must receive environmental awareness training prior to commencement of the activities to explain the potential environmental and species impacts of construction activities, promote practices that reduce these impacts, and ensure compliance with the EA and EMPr—as demonstrated through training records and induction documentation.		
c) All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr;		Monthly environmental toolbox talks.
d) Training must cover all the aspects outlined in this EMPr, specifically those aspects and management measures detailed in Section 6 and 7 (for construction and operation, respectively)		
e) The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course;		
f) Refresher environmental awareness training is available as and when required;		
g) The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum:		

Impact management outcome: Provide environmental awareness training to ensure all onsite staff are aware and understands the individual responsibilities in terms of this EMPr to ensure effective implementation and compliance.

Essential Management Actions/Mitigation Measures (Method of implementation)	Person responsible for Implementation	Timeframe of Implementation
i. Safety notifications; ii. Suitable handling and disposal protocols; and i. No littering. h) Environmental awareness training must include as a minimum the following: i. Description of significant environmental impacts on the environmental and species related to their work activities. This includes explaining the detrimental impacts of pollution on aquatic species; i. Mitigation measures to be implemented when carrying out specific activities; ii. Heritage induction and training for ground crew (Incl. ECO) must be conducted, in identifying heritage resources. iii. Emergency preparedness and response procedures; iv. Emergency procedures, including spill and disaster management; v. Procedures to be followed when working near or within sensitive areas; vi. Wastewater management procedures; vii. Water usage and conservation; viii. Solid waste management procedures (including littering and pollution); ix. Sanitation procedures; i. Fire prevention (Contact numbers for the local Fire Protection Agency (FPA) and emergency services must be communicated during training and displayed at a central location on site). ii. Disease prevention; and iii. Hazardous substances management. h) A record of all environmental awareness training courses undertaken as part of the EMPr must be available; i) Course material must be available and presented in appropriate languages that all staff can understand. j) Monthly environmental toolbox talks must be given to remind staff of their responsibilities.		

6.3 OVERALL ENVIRONMENTAL MANAGEMENT

Impact management outcome: Ensure overall Environmental Management to ensure compliance with the EMPr, EA and legislation and enable effective monitoring of compliance.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) The duration and spatial extent of construction in the terrestrial, estuarine (Estuarine Functional Zone), and marine environment must be kept to a minimum and must stay inside the development footprint. b) The Contractor, Developer, and all personnel on site must comply with all applicable environmental legislation. c) The Environmental Officer (EO), Environmental Compliance Officer (ECO), or another designated responsible person must be present on site to monitor earthworks and construction activities, particularly within estuarine and marine areas, and to check for any heritage resources. d) Take photos as needed to record progress and any environmental changes during construction. e) Photograph any incidents or non-compliances where possible to support records and reporting.	Contractor/ Contractors EO/ ECO	Throughout Construction Phase

6.4 DUST AND AIR QUALITY MANAGEMENT

Impact management outcome: Maintain earthworks and dust management practices in a manner that ensures that public health and safety are assured and environmental, air and water quality degradation are minimised.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Develop and implement management plan (as per method statement in 3.2). b) Ensure full compliance with all relevant national and municipal policies, regulations, and guidelines regarding noise and dust management, particularly when working near roads, sensitive receptors, and existing infrastructure, demonstrated through monitoring records and site inspection reports. c) Implement regular cleaning and maintenance of the construction site to prevent dust accumulation on surfaces, access roads, and surrounding areas, demonstrated through site logs, photographic evidence. d) Cover or securely store loose construction materials, soil, and debris to prevent windblown dust, as demonstrated through site logs and photographic evidence. e) Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; f) Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible; g) Appropriate dust suppression measures must be used when dust generation is unavoidable, e.g. dampening with water (particularly during prolonged periods of dry weather in summer), clearing loose sand, covering stockpiles/ dust generating products, cover products when transported, implement temporary stabilising measures (e.g., straw, brush packs, chipping). These measures should be demonstrated through site logs and photographic evidence. h) For significant areas of excavation or exposed ground, or during dry and, or windy periods, a water tanker should be available (where required) for the control of dust, but ensure that the sprays do not generate excess run off. i) Where possible, excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present. j) During high wind conditions, the EO/ ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working must cease altogether until the wind speed drops to an acceptable level. k) Vehicle speeds must not exceed 40km/h along dust roads or 20km/h when traversing unconsolidated and non-vegetated areas.	Contractor/ Contractors EO	Throughout Construction Phase

6.5 SOIL, EARTHWORK, EROSION AND STOCKPILE MANAGEMENT

Impact management outcome: Minimise erosion, sedimentation, dust emission and degradation of water quality by implementing good soil, earthwork, erosion and stockpile management		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Develop and implement management plan (as per method statement in 3.2). b) When soil is excavated, the different natural layers of soil (horizons), such as the nutrient-rich topsoil, the subsoil beneath it, and any deeper layers, must be removed and stored in separate piles rather than mixed together to ensure that the layers are replaced in the correct order during rehabilitation, preserving soil quality, fertility, and proper drainage for vegetation recovery. All soils shall be reinstated in the reverse order to that in which they have been removed (where relevant). Topsoil must be kept in separate stockpiles and used for rehabilitation. c) All reasonable measures must be implemented to control erosion and sedimentation during construction, including the use of stabilisation techniques, silt fences, anti-erosion measures, etc, especially in areas at risk of erosion/runoff. d) All material that is excavated during construction must be stored appropriately on site in order to minimise impacts to watercourses, wetlands and water bodies (marine, estuarine, or fresh water). e) During periods of strong winds and heavy rain, the stockpiles should be covered with appropriate material (e.g. cloth, tarpaulin etc.). f) Where possible, sandbags (or similar) should be placed at the bases of the stockpiled material in order to prevent erosion of the material. g) Stockpiles must not exceed 2 m in height. h) All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods. i) Refuelling and other activities with the potential to cause pollution shall not be allowed on or adjacent to a stockpile. j) Polluted soil should be collected and disposed of appropriately, during and after construction. k) Spoil shall be used as backfill to rehabilitate areas impacted upon by construction activities. l) Excess spoil material shall be disposed of at locations as identified by the ECO. m) Stabilise cleared, exposed and other areas prone to erosion to prevent and control erosion. n) Monitor construction areas for erosion regularly, especially post rainfall and repair any damage where erosion and/or sedimentation has occurred. o) Exposed areas shall be stabilised within one week of their exposure. p) Runoff from roads and other hard surfaces must be managed to avoid erosion.	Contractor/ Contractors EO	Throughout Construction Phase

Impact management outcome: Minimise erosion, sedimentation, dust emission and degradation of water quality by implementing good soil, earthwork, erosion and stockpile management		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
q) Changes in natural gradients due to construction activities shall be avoided where possible or mitigated by levelling the slope to the original gradient. Where slopes have been created, anti-erosion mechanisms shall be implemented (e.g., such as knocking in stakes, installing gabions, geo textiles or similar). r) Where necessary, silt traps should be installed to minimise silt from entering the storm water, sewerage and estuarine systems.		

6.6 WATER SUPPLY MANAGEMENT

Impact management outcome: Undertake responsible water usage to reduce pressure on local water supply resources and support sustainable water use.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Ensure water conservation is being practiced by: i. Minimising water use during cleaning of equipment; ii. Undertaking regular audits of water systems; and iii. Including a discussion on water usage and conservation during environmental awareness training.	Contractor/ Contractors EO/ ECO	Throughout Construction Phase

6.7 WATER, STORM WATER, WASTE WATER AND RUN-OFF MANAGEMENT

Impact management outcome: Minimise water, stormwater and silt/ soil run-off into estuarine and any other freshwater systems to preserve water quality within affected resources such that their integrity is assured.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Storm water and run-off must be managed using best practice and measures indicated below to improve storm water management systems, to reduce the amount of litter, debris, topsoil, run-off, contaminants and/ or sewage entering the marine systems. A method statement for this management must be prepared in accordance with Section 3.2. b) Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO. c) Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; d) Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager. Water impacted upon by construction related activities shall not be released directly into the environment. e) Runoff from roads must be managed to avoid erosion and pollution problems. Where necessary, silt traps should be installed to minimise silt from entering the storm water, sewerage and estuarine systems. f) Storm water shall be directed towards stabilised areas which can dissipate the energy of the water flow. No ponding shall be permitted. g) No handling of hazardous substances, storing of equipment, ablution or waste disposal are permitted in close proximity to water resources or storm water drains.	Contractor/ Contractors EO/ ECO	Throughout Construction Phase

6.8 WASTE MANAGEMENT

Impact management outcome: Implement waste hierarchy principles to ensure waste generation is reduced; reuse and recycling is promoted; all waste streams receive responsible treatment; safe disposal is assured; and pollution is prevented.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
General Measures and Training a) A Solid & Liquid waste management plan shall be developed and implemented as per Section 3.2. b) A “reduce, reuse, recycle” approach must be followed to reduce amounts of waste that need to be disposed of at a landfill. c) Suitable handling and disposal protocols must be clearly explained, and sign boarded. d) Inform and train all staff about sensitive estuarine, marine, and terrestrial species and the responsible segregation and disposal of construction waste. This training must be integrated into toolbox talks or onsite awareness sessions to ensure that waste management practices are understood and followed diligently. Additionally, contractors must prepare a method statement outlining specific waste management procedures, which must be approved by the resident engineer before construction activities commence.	Developer/ Contractor/ Contractors EO/ ECO	
Waste Storage, Segregation & Site Infrastructure e) Provide suitable, sufficient, covered (scavenger and weatherproof) containers for the disposal of all waste, including recycling, located at a suitably positioned and clearly demarcated waste collection site. f) Waste must be segregated into separate bins that are clearly marked for each waste type; general waste shall be stored separately from hazardous waste, and hazardous waste shall be stored in a bunded weatherproof area. i. Should any asbestos waste material be discovered on site, rehabilitation of the site should be conducted in consultation with the National Department of Labour and in accordance with the Asbestos Regulations, as amended. g) Waste containers and bins must be emptied on a regular basis and must not be allowed to become overfull. h) Adequate sanitary facilities and ablutions must be provided for all personnel throughout the project area, with enforcement of facility usage and cleanliness being crucial.		Throughout Construction Phase
Waste Disposal Compliance, Licensing & Records i) General waste that is not reused or recycled must be removed regularly and can only be disposed of at a registered landfill, with waste disposal at licensed landfill sites by qualified contractors being mandatory. j) Hazardous waste must be disposed of at a hazardous waste disposal site. k) Overburden/spoil must be disposed of at a registered landfill or at spoil areas authorised by the ECO; where the volume of spoil generated for disposal outside of a registered landfill site exceeds the thresholds stipulated within GNR 921 (National Environmental Management: Waste Act (Act 59 of 2008) List of Waste Management Activities,		

Impact management outcome: Implement waste hierarchy principles to ensure waste generation is reduced; reuse and recycling is promoted; all waste streams receive responsible treatment; safe disposal is assured; and pollution is prevented.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
29 November 2013, as amended), the ECO shall be notified and a Waste License must be obtained prior to any spoiling. l) All sewage must be removed to the municipal wastewater treatment works. m) Proof of disposal must be retained on site and submitted to the appointed Environmental Officer/ECO for all waste streams, and certificates/receipts of safe disposal for general, hazardous and recycled waste must be maintained. n) Waste management certification must be obtained, and detailed records of all stored and disposed waste, including quantity, nature, and fate, must be maintained for auditing purposes. Litter Control, Prohibitions & Site Clean-Up o) Regular litter sweeps should be carried out around the construction site, and daily collection, clean-ups and removal of refuse, litter and other pollutants from the area must be ensured, especially from intertidal areas, with the active clean-up of the Port environment also undertaken, including weekly beach clean ups by TNPA. p) Intentional disposal of any litter into the environment is strictly prohibited; littering and intentional disposal or dumping of waste materials, concrete, mortar or any other substance into the terrestrial, marine and estuarine environment is prohibited; and no on-site burying, dumping or burning of any waste materials, vegetation, litter or refuse may occur. q) Accidental spillage must be prevented, contained and reported immediately to the responsible Environmental Officer, Environmental Control Officer or other relevant party.		

6.9 HAZARDOUS SUBSTANCE AND SPILL MANAGEMENT

Impact management outcome: Preserve the receiving environment, well-being of staff and local communities through appropriate hazardous substance storage, handling, disposal and pollution prevention.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
Planning, Authorisation & Management Systems a) A Hazardous Waste management plan shall be developed and implemented as per Section 3.2. b) An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis, and all hazardous chemicals that must be used on site must have Material Safety Data Sheets (MSDS).	Contractor / Contractors EO/ ECO	Throughout Construction Phase

Impact management outcome: Preserve the receiving environment, well-being of staff and local communities through appropriate hazardous substance storage, handling, disposal and pollution prevention.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
c) Substances used shall be the least environmentally harmful chemical available for the undertaking of specific duties/requirements. Hazardous Substances Handling, Training & Access Control d) All hazardous substances must be accompanied by a permit and a hazard report sheet, and may only be handled by suitably trained operators, with all employees working with HCS trained in the safe use of the substance according to the safety data sheet. e) Employees handling hazardous substances/materials must be aware of the potential impacts, follow appropriate safety measures, and be provided with appropriate personal protective equipment. f) Safety signs shall inter alia be depicted, conform to the requirements of SANS 1186-1, and be prominently displayed in and around the storage area, with signage containing clearly displayed emergency contact numbers provided. g) No unauthorised access into the hazardous substances storage areas shall be permitted, and the responsible operator must have the required training to make use of the spill kit in emergency situations. Storage, Containment & Infrastructure h) All hazardous substances/chemicals must be stored in suitable containers which are clearly marked to indicate contents, quantities and safety requirements, and must be placed in well-ventilated secondary (impermeable) containers/storage areas which shall be locked at all times, with inventory controlled by means of an inventory checklist. i) All storage areas must be bunded with bunds capable of 110% of the volume of the container to contain leaks, and any water that collects in a bund must not be allowed to stand, must be removed within one day, and must be taken off site to a disposal site approved by the developer. j) The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsters, with fuel tanks, pumps and all equipment using oil, diesel, etc. fitted with adequate spill protection such as bunds and drip trays. k) The tanks/bowsters must be situated on a smooth impermeable surface (concrete) with a permanent bund; the impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/bowsters (110% statutory requirement plus an allowance for rainfall), and the floor of the bund must be sloped, draining to an oil separator. l) All hazardous substance storage areas shall be equipped with fire-fighting equipment and spill kits appropriate for the type and volume of the substance and the scale of the activity/s involving the use of hazardous substance.		

Impact management outcome: Preserve the receiving environment, well-being of staff and local communities through appropriate hazardous substance storage, handling, disposal and pollution prevention.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
Spill Prevention, Control & Remediation		
a) Intentional disposal of any substance into the environment is strictly prohibited, while prevention measures must be applied as far as reasonably possible to prevent the discharge or spillage of any hazardous substance or any pollutants into the environment or any water resource, whether intentional or accidental, and accidental spillage must be prevented, contained and reported to the responsible Environmental Officer, Environmental Control Officer or other relevant party immediately. b) All fuel and oil is to be stored with adequate spill protection. c) All vehicles and plant must be properly maintained to prevent leaking of oils, diesel, fuel or hydraulic fluids. d) No leaking vehicles are permitted on site, and no vehicles or power plant(s) may be parked in the intertidal zone. e) Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used. f) Implement leak detection and maintenance programmes for valves, flanges, fittings, seals, hydraulic systems, hoses, etc., ensuring all hydraulic systems are adequately maintained and hoses are frequently inspected; all process areas should be bunded to ensure drainage water flows into the closed drainage system, and drip trays should be used to collect run-off from equipment not contained within bunded areas, with contents routed to the closed drainage system. g) Low-toxicity biodegradable detergents should be used in the cleaning of all spillages. h) Spillages that occur within the development footprint must be cleaned up immediately; in the event of a spill the items used must be replaced immediately; and contaminated soil must be collected in containers, stored in a central location, and disposed of according to the National Environmental Management: Waste Act 59 of 2008.		

6.10 FIRE MANAGEMENT

Impact management outcome: Prevent and control fires to the extent that public health; safety; property and environmental protection are assured.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Develop and implement management plan (as per method statement in 3.2). b) The Contractor shall assign the position of Fire Officer to one of its senior staff members who shall be competent and adequately trained to fulfil the position of Fire Officer. c) The Fire Officer shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedures to be followed. The Fire Officer shall be responsible for contacting emergency services for assistance. d) Annual review, updating and approval of the fire management response plan before onset of fire season. e) Smoking shall only be permitted in designated smoking areas where the fire hazard could be regarded as insignificant; and the disposal of cigarette butts into the surrounding environment are not be permitted. f) No on-site burning of any waste materials, vegetation, litter or refuse shall be permitted. g) Suitable fire-fighting equipment/ fire extinguishers shall be stored in close proximity of flammable chemicals/ products and where hot work must be performed and must be available at all times. h) Fire extinguishers shall be checked on a monthly basis to ensure they have not been used/exceeded their yearly service intervals and must be checked prior to the commencement of the fire season. i) Grass and other vegetation in the vicinity of infrastructure shall be cut at regular intervals to reduce fuel load and fire hazards j) No fires may be lit on site. k) Any fires that occur shall be reported to the EO, Contractor and Developer immediately. l) The relevant local Fire Protection Agency (FPA) must be made aware of a fire as soon as it starts.	Contractor/ Contractors EO/ ECO/ Fire officer	Throughout Construction Phase

6.11 BATCHING PLANTS

Impact management outcome: Prevention of pollution of soil, surface water, marine and estuarine environment, and groundwater, through properly managed batching plant operations.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Concrete mixing must be carried out on an impermeable surface (such as on boards and/or within a bunded area with an impermeable surface) or a hard surface shall be constructed and removed when done. b) Concrete mixing areas must be fitted with a containment facility for the collection of cement laden water. This facility must be impervious to prevent soil and groundwater contamination. c) Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains. d) A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted. e) Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; f) Empty cement bags must be secured with adequate binding material if these must be temporarily stored on site; g) Sand and aggregates containing cement must be kept damp to prevent the generation of dust h) Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; i) Concrete shall be mixed in appropriate structures to prevent the contamination of the surrounding environment. Plastic sheets and the bare ground shall not to be used for mixing purposes. No mixing of concrete and no hazardous substances allowed in the intertidal zone. j) Cement shall be stored within weatherproof facilities / covered to prevent environmental contamination. a) Excess concrete and wash water from the concrete truck's drum shall be disposed of at ECOs approved locality.	Contractor/ Contractors EO/ ECO/	Throughout Construction Phase

6.12 PROTECTION OF TERRESTRIAL FAUNA AND FLORA

Impact management outcome: Minimise disturbance, degradation, and pollution of the terrestrial environment which could lead to reduced ecological functioning, species mortality, and loss of habitat/biodiversity.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Implementation of measures in Section 6.2, 6.3, 6.4, 6.5, 6.7, 6.8, 6.9, 6.10, 6.11, and any other relevant sections, in addition to the measures contained herein: b) Implementation of relevant method statements as per Section 3.2. This includes a Search and Rescue plan, fauna interaction and risk management plan and any other relevant method statements. c) Qualified person(s) must be contacted to remove wildlife, nests and snakes. d) Harming, trapping, poisoning, shooting, collecting and/ or keeping of animals is strictly forbidden. e) Open excavations shall be adequately fenced to prevent access by wildlife or livestock. f) Open excavation must be checked each morning for the presence of animals g) No domestic pets or livestock are permitted on site. h) Construction lighting must, where possible, be limited to reduce unnecessary impacts on local fauna, while still allowing enough lighting for staff H&S concerns. i) Undertake environmentally-friendly pest control in the camp area.	Contractor/ Contractors EO/ ECO/ Specialists	Throughout Construction Phase/ Some actions to occur as and when required

6.13 VEGETATION AND VEGETATION CLEARING

Impact management outcome: Minimise impacts on surrounding habitats and species due to the spread of alien invasive plant species, habitat disturbance and destruction, and contamination due to pesticides.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Implementation of relevant method statements as per Section 3.2. This includes a vegetation management plan and any other relevant method statements. b) Development and implementation of an Invasive Alien Plant Management Plan in accordance with Section 75 of the NEMBA and as per the "Alien and Invasive Species Regulations, 2020 (and in line with relevant municipal and provincial procedures, guidelines and recommendations). Alien invasive vegetation should be removed from the development footprint according to this plan and disposed of at a recognised waste disposal facility. This plan must also consider the following:	Contractor/ Contractors EO/ ECO/ Specialists	Throughout Construction Phase/ Some actions to occur as and when required/ Some actions to occur post-Construction Phase

Impact management outcome: Minimise impacts on surrounding habitats and species due to the spread of alien invasive plant species, habitat disturbance and destruction, and contamination due to pesticides.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
i. During construction, and for at least 6 months post-construction (or as per the period prescribed in the Invasive Alien Plant Management Plan), monitor and eradicate alien invasive plants (AIPs) from the construction site. All construction areas must be inspected for alien invasive species on a monthly basis. i. All imported construction material must be free of alien invasive or pest seeds/propagules. ii. Herbicides used for the control of invasive species must be administered at supplier recommended application rates, in accordance with the regulatory requirements pertaining to Fertilisers, Farm Feeds, Agricultural Remedies and the Stock Remedies Act (Act 36 of 1947)). Herbicides used shall be biodegradable where possible. d) Firewood may not be collected. e) Trees felled due to construction must be monitored and listed in the Audit Environmental Report. f) Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris. g) Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained. A daily register must be kept of all relevant details of herbicide usage. h) Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility, unless the landowners wish to retain the cut vegetation.		

6.14 PROTECTION OF MARINE AND ESTUARINE ECOLOGY

Impact management outcome: Minimise destruction and contamination of marine and estuarine environment and disturbance and mortality of species.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Development and implementation of relevant method statements as per Section 3.2. b) Implementation of measures in Section 6.2, 6.3, 6.4, 6.5, 6.7, 6.8, 6.9, 6.116.8, 6.9, and any other relevant sections, in addition to the measures contained herein: c) Construction activities within the coastal zone should be planned and undertaken as efficiently as practicable to avoid unnecessary delays and prolonged disturbance. d) Constrain spatial extent of impacts to the minimum required. e) Rehabilitate the disturbed area in the estuarine and intertidal area immediately following construction of the intake and outfall pipelines/structures, by removing all artificial materials not related to the permanent fixture of the pipeline. a) Ensure suitable stormwater management is in place to minimize run-off to the estuarine system. b) Establish buffer zones to protect water resources from pollution and habitat degradation. c) Intake and Outfall structures should be positioned away from sensitive environments or areas with high species diversity or abundance (e.g. rocky reefs). d) Water must not be drawn from the upper or the bottom one meter of the water column. e) Intake structures should ensure the horizontal intake of water. This can be achieved through use of footer valves if applicable. - f)	Contractor/ Contractors EO/ ECO/ Specialists	Throughout Construction Phase/ Some actions to occur as and when required/ Some actions to occur post-Construction Phase

6.15 STAFF HEALTH AND SAFETY AND EMERGENCY PROCEDURES

Impact management outcome: Ensure the Health and Safety of Staff by complying with the Occupational Health and Safety Act (OHSA) and through proper awareness, training and materials and equipment skills.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) An Emergency Response Action Plan (ERAP) must be compiled prior to the commencement of the proposed project. The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; b) Construction activities must be conducted in accordance with the Occupational Health and Safety Act (OHSA) and Regulations and TNPAs own Health and Safety protocols. c) All employees shall receive general Health and Safety (H&S) construction related work skills training required to enable them to work safely and effectively and to limit any impact on the environment. i. Training must include: i. Emergency procedures as part of the Emergency Response Action Plan (ERAP); ii. Spill, Emergency and Disaster Management. iii. Hazardous substances management. iv. Health and Safety. v. Proper Waste Disposal and Management (including littering and pollution). vi. Firefighting & fire prevention and fire safety training (including fire drills). d) No accommodation at camp sites shall be allowed. e) Personal Protective Equipment (PPE) must be available and worn by staff and visitors. All staff working with hazardous substances shall wear appropriate PPE as indicated in the relevant Material Safety Data Sheet (MSDS). f) The Contractor shall ensure a safe clean working environment. g) Up-to-date contact list of all emergency services. h) Co-ordinate emergency evacuation procedures with the local emergency services and conduct regular emergency drills (as per the requirements of the health and safety plan).	Contractor/ Contractors EO/ Health and Safety Officer	Prior to working on site and throughout Construction Phase

6.16 SANITATION

Impact management outcome: Ensure clean and well-maintained toilet/ sanitation facilities are available to all staff in an effort to minimise the risk of disease and impact on the environment.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Mobile chemical toilets are installed onsite if no other ablution facilities are available. b) The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances. c) Where mobile chemical toilets are required, the following must be ensured: i. Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; ii. No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMP;. iii. Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out; iv. Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; v. Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards; vi. A copy of the waste disposal certificates must be maintained.	Contractor/ Contractors EO/ Health and Safety Officer	Throughout Construction Phase

6.17 WORKSHOP, EQUIPMENT MAINTENANCE AND STORAGE

Impact management outcome: Prevention of environmental risks through proper workshop, equipment maintenance, and storage practices.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Develop and implement management plan (as per method statement in 3.2). b) Routine inspection and maintenance of equipment must be done c) Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area. d) During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. e) Leaking equipment must be repaired immediately or be removed from site to facilitate repair. f) The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil/ water separator where maintenance work on vehicles and equipment can be performed;	Contractor/ Contractors EO	As and when required

6.18 TRAFFIC MANAGEMENT

Impact management outcome: Minimise excessive/ additional road traffic to ensure public health and safety.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Develop and implement management plan (as per method statement in Section 3.2). b) Movement of all vehicles and plant, including that of suppliers, shall be so routed and operated as to minimise disruption to regular users of the routes not on the Site and to not cause an undue concentration of traffic. c) All relevant laws must be complied with. d) Where road safety may be impacted on, the Contractor shall notify the relevant roads authority and arrange for the necessary road warning signage and appoint trained points men to control traffic around any hazards. e) Where access to properties needs to be closed, alternative access for the duration of the closure shall be provided. The Contractor shall notify affected parties 48 hours before closure. f) Flagmen shall be deployed at partial road closures and other traffic disruptions to ensure the safety of the public. g) Any accidents or incidents shall be recorded, and the ECO notified immediately. Investigation into the causes must be done.	Contractor/ Contractors EO/ ECO	Throughout Construction Phase (as and when required)
Best Practice/ Recommended Management Actions/Mitigation Measures		

Impact management outcome: Minimise excessive/ additional road traffic to ensure public health and safety.		
	Person responsible for Implementation	Timeframe of Implementation
h) The travelling public shall have the right of way on public roads.		
i) Full closure of existing roads shall not be allowed.		
j) All vehicles shall remain on designated routes.		

6.19 ARCHAEOLOGICAL, CULTURAL HERITAGE, AND PALAEOLOGICAL RESOURCES MANAGEMENT

Impact management outcome: Minimise impacts associated with damage to/loss of/destruction of heritage resources, and enhance the preservation of heritage resources.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
General Management Actions	Contractor/ Contractors EO/ Heritage Specialist/ SAHRA/ ECPHRA	
a) Monitoring of earthworks by the ECO, EO or another designated responsible person.		
b) All heritage resources encountered shall be avoided and protected.		
c) If Heritage material (fossils, stone artefacts, midden material etc.) are uncovered, construction activities should stop in the locality of the find and the heritage professional called in to assess the find.		
d) Heritage monitoring and reports to be shared with ECPHRA.		
e) Upon completion of the project, a final heritage compliance report to be submitted to ECPHRA.		
f) If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA DAU (Nokukhanya Khumalo/Natasha Higgitt 021 202 8660) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offence in terms of section 51(1)e of the NHRA and item 5 of the Schedule.		Only during Excavations
g) If unmarked human burials are uncovered, the SAHRA DAU (Nokukhanya Khumalo/Natasha Higgitt 021 202 8660), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offence in terms of section 51(1)e of the NHRA and item 5 of the Schedule.		
h) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;		
Palaeontology		
a) A palaeontologist must be on site, to monitor, during excavations.		

Impact management outcome: Minimise impacts associated with damage to/loss of/destruction of heritage resources, and enhance the preservation of heritage resources.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
b) Implementation of a Palaeontological Fossil Chance Find Protocol by the ECO/ EO to ensure the identification, recovery, curation and reporting to SAHRA/ ECPHRA of any fossil finds. If fossils are found by the EO/ ECO, or other responsible person once excavations for foundations have commenced, these should be rescued and SAHRA and ECPHRA notified to determine whether a palaeontologist should be called to assess and collect a representative sample. Any recovered fossils or artefacts are the property of the State must be deposited in a suitable curatorial institution. Information on the sources or contexts of the collected items must accompany them, as far as can be determined. c) If fossils are found by the environmental officer, or other responsible person once excavations for foundations have commenced then they should be rescued and SAHRA and ECPHRA notified to determine whether a palaeontologist should be called to assess and collect a representative sample. d) Any recovered fossils or artefacts are the property of the State must be deposited in a suitable curatorial institution. Information on the sources or contexts of the collected items must accompany them, as far as can be determined. Maritime Archaeology e) Shipwrecks/ shipwreck remains are generally large and visible on the seabed & therefore measures must be taken in advance of installation activities to avoid the site/ material. f) Any wreck or related artefacts identified during any pre-construction ground-truthing of the marine outfall site must be flagged and the information shared with a suitably qualified maritime archaeologist and the South SAHRA. g) If seabed debris or a previously unknown wreck are encountered during the installation of the marine outfall, the project maritime archaeologist and SAHRA must be notified immediately and work must cease in the immediate vicinity until the maritime archaeologist and SAHRA have assessed the significance of the site and a decision has been taken as to how to deal with it. • A suitably defined construction exclusion zone is required around any such site, material or wreck to ensure that it is not impacted by the installation of the marine outfall. The project maritime archaeologist's advice must be sought on the appropriate size and extent of any such exclusion zone. Any such exclusion zones must be marked on all project mapping as no-go areas for construction contractors. Terrestrial Pre-Colonial & Historical Archaeology h) Implementation of a Heritage Chance Finds Procedure by the ECO, EO or another designated responsible person. i) Should any terrestrial pre-colonial or historical archaeological sites, material, or human remains be encountered during the construction of the development, all activities in the vicinity must cease and the site made secure until a suitably qualified archaeologist and SAHRA and the ECPHRA have been notified, the significance of the material has been assessed, and a decision has been taken as to how to deal with it.		

6.20 MANAGEMENT OF COMMUNITY AND SOCIAL ASPECTS

Impact management outcome: Preserve good relations with neighbouring communities to ensure maximum social benefits, and minimum negative impacts.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Development boundary shall display relevant signage. b) Communications register shall be kept on site to record any comments/ complaints/ interactions from community. c) The Contractor shall adhere to the following timeframes for dealing with stakeholder concerns: - Record the concern within the Communications Register and verbally notify the ECO immediately. - Respond to the concern – within two weeks of the concern being raised – this includes consulting with the stakeholder. - Rectify/mitigate the concern – within two weeks of the concern being raised. - Respond in writing to the stakeholder on “close out” of the concern – within 7 days of the concern being rectified. - Submit to the ECO a detailed report – within 7 days of the concern being raised. d) During work hours the Contractor shall be vigilant of potentially negative interactions between staff and the surrounding communities. e) Trespassing on land adjacent to the project area is not allowed. f) Access to site by people not involved in the project shall be controlled.	Contractor/ Contractors EO/ ECO / Developer	Throughout Construction Phase

6.21 MANAGEMENT OF SOCIO-ECONOMIC ASPECTS

Impact management outcome: Maximise the economic benefits and minimise economic impacts associated with the construction of the plant.		
Recommended/Best Practice Optimisation Measures	Person responsible for Implementation	Timeframe of Implementation
a) While the construction phase is not expected to result in many new job opportunities (as workforce requirements are small, and much of the specialised work will be undertaken by existing contractors and personnel—some potentially from outside East London), should new job opportunities arise, then a local labour procurement policy should be employed (where feasible). This can be demonstrated through employment, payroll, procurement, and supplier records. b) Source construction materials, goods and services from local suppliers wherever practical, as demonstrated through procurement documentation and supplier databases. Engage with local authorities and business associations to source construction materials, goods, and services from local suppliers wherever practical.	Contractor/ Contractors EO	Must be considered during Planning Phase and Implemented during Construction Phase

6.22 MANAGEMENT OF VISUAL ASPECTS

Impact management outcome: Ensure that general site cleanliness and order are maintained throughout the construction phase, and that “Good Housekeeping” practices are implemented to minimise undue visual impacts and disturbance.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) The site must be kept tidy. Equipment and material to be stored neatly. b) Lighting must be installed in such a manner to provide adequate lighting for Health and Safety requirements at night, but to not disturb surrounding properties. c) No natural features may be defaced. d) Material stockpiles (where applicable) must not be higher than 2m and must be maintained.	Contractor/ Contractors EO	Throughout Construction Phase

6.23 NOISE MANAGEMENT

Impact management outcome: Minimise noise and associated disturbance and nuisance to surrounding communities, workers, and wildlife.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Develop and implement management plan (as per method statement in 4.2). b) Construction noise must comply with any relevant noise legislation, including the BCMM Noise By-Law and Draft BCMM Noise By-Law or as determined by the local authorities. Where not defined, development must be limited to daylight hours. c) Efforts must be made to limit noise during the construction phase (including all unnecessary noise production). a) All construction related vehicles, plant, and equipment shall be properly maintained to avoid creation of unnecessary additional noise. b) Where possible, local community/ port employees shall be forewarned before noisy operations commence, should it be likely that they will be impacted. c) Loud maintenance activities are to be constrained to reasonable hours during the day. d) Where possible, noisy operations shall be combined so that they occur concurrently, to reduce the total period of noise generation.	Contractor/ Contractors EO/ ECO	Throughout Construction Phase

6.24 REHABILITATION

Impact management outcome: Reinstate impacted areas to an extent that commercial, recreational and environmental protection are assured and no environmental degradation occurs as a result of development.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Develop and implement management plan (as per method statement in 3.2). a) After construction has ceased, the site shall be cleared of equipment and any other materials emanating from the works. b) Rehabilitate/re-vegetate construction and other areas disturbed during construction with indigenous plant species where possible/ feasible (with guidance from the EO and ECO). Where required, re-vegetation can be enhanced using a vegetation seed mixture as described below. Contractor shall undertake irrigation of rehabilitated areas for a minimum period of six to eight weeks to encourage germination (if applicable). A mixture of seed can be used provided the mixture is carefully selected to ensure the following: i. Annual and perennial plants are chosen; ii. Pioneer species are included; iii. Species chosen must grow in the area feasible to grow; iv. Root systems must have a binding effect on the soil; v. The final product should not cause an ecological imbalance in the area c) Stockpiled topsoil must be used for rehabilitation and reinstated at the minimum depths of 150 mm and placed slightly higher level than the surrounding undisturbed soil to account for soil settlement. d) Disturbed areas shall be ripped and / or scarified to a depth of 450 mm. e) It is recommended that, as far as possible, all vegetation cleared through site clearance activities be chipped to provide mulch for soil stabilisation requirements and that such mulch shall be left to compost. f) Rehabilitate the disturbed area in the intertidal area immediately following construction of the intake and outfall pipelines by removing all artificial materials not related to the permanent fixture of the pipelines.	Contractor/ Contractors EO	Post Construction Phase

7 OPERATIONAL ENVIRONMENTAL MANAGEMENT MEASURES

7.1 OVERVIEW

The following section outlines the management outcomes and actions that must be implemented during the operational phase to manage and mitigate potential impacts. As the plant's operation is expected to generate fewer impacts, the number of receptors, outcomes, and actions is also reduced. However, if any additions or modifications to the development are required, such as further construction or alterations, the construction-phase receptors and associated Management Outcomes and Actions as listed in Section 6 above should be applied in full.

The holder of the EA and the Contractor are reminded that their compliance with Sections 5, 6 and 7 will be subject to monitoring and auditing, which must be carried out in accordance with Sections 3.9 and 3.10, and using the information and guidance provided in Section 2 and Section 3.

7.2 ENVIRONMENTAL TRAINING

Impact management outcome: Provide environmental awareness training to ensure all onsite staff are aware and understands the individual responsibilities in terms of this EMPr to ensure effective implementation and compliance.

Essential Management Actions/Mitigation Measures (Method of implementation)	Person responsible for Implementation	Timeframe of Implementation
a) Implemented as per the method statement.	Contractor/ Contractors EO/ ECO	As and when required for any staff/ contractors involved in the operation, routine inspection, maintenance and cleaning of the plant, prior to them going onto site. Refresher course every six-months thereafter.
b) All staff must receive environmental awareness training prior to commencement of the activities as stipulated in Section 6.2, as appropriate and applicable to the operational activities.		
c) Operational Phase training must cover all the aspects outlined in this EMPr, specifically those aspects and management measures detailed in Section 7.		

7.3 OVERALL ENVIRONMENTAL MANAGEMENT

Impact management outcome: Ensure overall Environmental Management to ensure compliance with the EMPr, EA and legislation and enable effective monitoring of compliance.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
h) Constrain spatial extent of development, activities and impacts to project footprint. i) The Contractor, Developer, and all personnel on site must comply with all applicable environmental legislation. j) Monitoring by the Environmental Compliance Officer (ECO), Environmental Officer (EO) or another designated responsible person during operation. k) Take photos as needed to record progress and any environmental changes. l) Photograph any incidents or non-compliances where possible to support records and reporting.	Contractor/ Contractors EO/ ECO	Throughout Operational Phase

7.4 EROSION AND RUN-OFF MANAGEMENT

Impact management outcome: Prevent erosion and water and silt/ soil run-off into estuarine environment by controlling soil loss and habitat degradation with the implementation of proper management actions, with the aim of protecting water quality, maintaining soil stability and productivity, minimising disturbance to adjacent terrestrial, estuarine, and marine environments and minimising safety risks.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) A storm water and run-off method statement shall be developed and implemented as per Section 3.2. b) Storm water and run-off must be managed using best practice and measures indicated below to improve storm water management systems, to reduce the amount of litter, debris, topsoil, run-off, contaminants and/ or sewage entering the marine systems. c) All reasonable measures must be taken to limit erosion and sedimentation within the development footprint due to the presence of the development and associated infrastructure, including the use of stabilisation techniques, silt fences, anti-erosion measures, etc, especially in areas at risk of erosion/runoff. d) Monitor area for erosion regularly, especially post rainfall and repair any damage where erosion and/or sedimentation has occurred. e) Exposed areas shall be stabilised within one week of their exposure.	Contractor/ Contractors EO	As and when required throughout Operational Phase

7.5 WASTE MANAGEMENT

Impact management outcome: Implement waste hierarchy principles to ensure waste generation is reduced; reuse and recycling is promoted; all waste streams receive responsible treatment; safe disposal is assured; and pollution is prevented.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) A Solid & Liquid waste management plan shall be developed and implemented as per Section 3.2. b) Waste management must follow the requirements of Section 6.8, applied only where relevant to the operational phase. c) Waste generated from the intake screen must be disposed of as per the specification of local municipality. d) Backwash and the chemicals from the periodic CIP flush (once every 3-6 months) must be collected in a sump within the building that goes to the brine tank for mixing with brine (allowing dilution), natural aeration and then ocean discharge.	Contractor/ Contractors EO	As and when required throughout Operational Phase

7.6 HAZARDOUS SUBSTANCE AND SPILL MANAGEMENT

Impact management outcome: Prevent spillages and pollution of hazardous substances to preserve the receiving environment, well-being of staff and local communities through implementing appropriate mitigation measures.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) This must be implemented as per the method statements in Section 3.2. b) Hazardous Substance and Spill Management must follow the requirements of Section 6.9, applied only where relevant to the operational phase.	Contractor/ Contractors EO	Throughout Operational Phase

7.7 FIRE MANAGEMENT

Impact management outcome: Prevent and control fires to the extent that public health; safety; property and environmental protection are assured.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Fire Management must follow the requirements of Section 6.10, applied only where relevant to the operational phase.	Contractor/ Contractors EO/ ECO/ Fire officer	Throughout Operational Phase

7.8 INTAKE INFRASTRUCTURE AND PROTECTION OF ESTUARINE ECOLOGY

Impact management outcome: Reduce environmental degradation, protect water quality, and minimise impacts on surrounding habitats and species.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Intake velocities must remain below 0.15 m/s to ensure that fish and other mobile organisms can escape the intake current. b) Intake must have a strainer barrier to prevent entrainment of fish and other animals. c) Intake should ensure that water is not drawn from the upper or the bottom one meter of the water column. d) Intake should ensure the horizontal intake of water.	Engineers/ Contractor	Throughout Operational Phase

7.9 ROUTINE INSPECTION, MAINTENANCE AND CLEANING OF INTAKE AND OUTFALL PIPELINES, INTAKE STRAINER AND ANY OTHER EQUIPMENT

Impact management outcome: Prevent environmental contamination, reduce harm to marine life, and ensure continuous and safe system functioning, through inspections, maintenance, and cleaning, of intake and outfall pipelines, intake strainer, and any other equipment.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
General a) Develop and implement management plan (as per method statement in 3.2).	Contractor/ Contractors EO	
Routine inspection and cleaning of intake strainers b) A visual inspection of the intake must be performed daily c) Should the intake strainers need to be cleaned due to blockage, either of the following approaches must be followed; i. If the component is removable, the component must be removed and mechanically (scrubbing and or pressure hosing) cleaned on land ii. Non removable components must be cleaned mechanically (scrubbing and/or pressure hosing) either by trained personnel on the pontoon, or by a team of divers iii. The removed debris must be disposed of as appropriate for the type of waste.		As and when required throughout Operational Phase
Routine inspection and maintenance of the intake pipelines d) The intake system has a chlorine dosing system which helps to minimise marine growth within the intake pipeline		

Impact management outcome: Prevent environmental contamination, reduce harm to marine life, and ensure continuous and safe system functioning, through inspections, maintenance, and cleaning, of intake and outfall pipelines, intake strainer, and any other equipment.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
e) Further mechanical cleaning of the intake pipeline must be performed either by pipeline pigging, or the removal of discrete pipeline segments to be replaced or cleaned in a suitable workshop or area.		
Routine inspection and maintenance of the outfall pipelines		
f) Mechanical cleaning of the outfall pipeline must be performed either by pipeline pigging, or the removal of discrete pipeline segments to be replaced or cleaned in a suitable workshop or area.		
Other equipment and components		
g) Other equipment and components such as storage tanks and electrical equipment, amongst others, should regularly be inspected for any weaknesses/damage.		
Waste management from filter backwash and chemical cleaning processes		
h) Backwash and the periodic CIP flush (occurring once every 3–6 months), is first collected in a sump within the desalination building. Hereafter it goes to the brine tank for mixing with brine (allowing dilution), natural aeration and finally gets discharged into the ocean with the brine.		

7.10 EFFLUENT DISCHARGE MANAGEMENT, COMPLIANCE WITH COASTAL WATERS DISCHARGE PERMIT AND PROTECTION OF MARINE ECOLOGY

Impact management outcome: Ensure that effluent/ brine discharges comply with the CWDP to minimise degradation, disturbance, and impacts on marine habitats and species, thereby protecting the marine environment.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Effluent discharged must meet the end of pipe concentrations modelled in the Marine Specialist Study and thereby comply with conditions in the Coastal Waters Discharge Permit (CWDP). In addition, and in assisting with achieving this, the following requirements must be complied with:	Contractor/ Contractor's EO/ ECO/ Specialist	
i. Ensuring aeration of the effluent prior to discharge when oxygen scavengers (such as sodium metabisulphite) are used.		Effluent Management throughout Operational Phase
ii. Ensuring the neutralisation of extremely alkaline or acidic solutions and the treatment of additional cleaning agents prior to discharge.		Monitoring as per the CWDP conditions
iii. Ensuring the continual release of small volumes of chemicals used during the CIP process with the brine stream to allow for maximum dilution before entering the environment.		

Impact management outcome: Ensure that effluent/ brine discharges comply with the CWDP to minimise degradation, disturbance, and impacts on marine habitats and species, thereby protecting the marine environment.

Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
iv. Ensuring adequate hydraulic mixing and dilution of brine. a) The above effluent requirements can be achieved through the installation of a brine holding tank, which would act as an effective treatment and conditioning system. Within the tank, natural aeration, hydraulic mixing, dilution, neutralisation and pH equalisation would occur as part of normal operation. Should the tank be installed, no additional chemical dosing or mechanical aeration is required, unless monitoring indicates otherwise. These dosing levels should be adjusted should adverse effects be detected by the monitoring program. b) During operation, ongoing environmental monitoring is required to ensure that the desalination plant's brine discharge (end-of-pipe concentrations) complies with the conditions of the CWDP and to detect and manage any potential environmental impacts over the life of the plant. c) Monitoring requirements, including the frequency of monitoring and the specific parameters to be measured, have been set out in the CWDP. Monitoring data must be compared to the baseline data collected as part of the Marine Specialist Assessment to determine impact over time. The results will provide an ongoing assessment of the influence of the outfall structure and brine discharge on biodiversity and ecosystem health. The following measures (amongst others) are applicable throughout the full operational life of the plant: i. Point source measurements (for example Conductivity, Temperature and Depth (CTD) profiling of the water in line with ongoing environmental monitoring requirements). ii. Continuous water quality monitoring through deployment of a suitable instrument, which measures specific parameters, at the edge of the Recommended Mixing Zone (RMZ), to measure compliance with permitted discharge limits and parameters. iii. Collecting sediment and biotic samples at the edge of the RMZ, to assess sediment characteristics and benthic macrofaunal communities.		

7.11 ALIEN AND INVASIVE PLANT MANAGEMENT

Impact management outcome: Control the spread of alien and invasive plant species.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Implementation of an Invasive Alien Plant Management Plan. Refer to Section 6.13.	Contractor/ Contractors EO/ ECO/ Specialists	Throughout Operational Phase or as prescribed in the Invasive Alien Plant Management Plan.

7.12 STAFF HEALTH AND SAFETY AND EMERGENCY PROCEDURES

Impact management outcome: Ensure the Health and Safety of Staff by complying with the Occupational Health and Safety Act (OHSA) and through proper awareness, training and materials and equipment skills.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Any activities must be conducted in accordance with the Occupational Health and Safety Act (OHSA) and Regulations and TNPAs own Health and Safety protocols.	Contractor/ Contractors EO	Prior to working on site and throughout Operational Phase
b) Staff Health and Safety Management must follow the requirements as outlined in 6.15, applied only where relevant to the operational phase.		
c) All employees shall receive the training as specified in Section 6.2 above, applied only where relevant to the operational phase.		

7.13 POTABLE WATER MANAGEMENT

Impact management outcome: Ensure that potable water meets SANS 241 standards and is managed to protect human health and prevent environmental harm.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Potable water must meet SANS 241 standards.	Developer/	Throughout Operational Phase Complaints management and inspection as and when required.
b) Complaints received regarding the water quality must be referred to the project manager and addressed immediately.	Contractor/ Contractor’s EO	
c) Potable water storage tanks must be inspected on a regular basis for any weaknesses/damage.		

7.14 MANAGEMENT OF COMMUNITY SOCIAL ASPECTS

Impact management outcome: Preserve good relations with neighbouring communities to ensure maximum social benefits, and minimum negative impacts.		
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Must follow the requirements as outlined in Section 6.20.	Contractor/ Contractors EO/ ECO / Developer	Throughout Operational Phase

7.15 MANAGEMENT OF SOCIO-ECONOMIC ASPECTS

Impact management outcome: Strengthen port operations and functioning as well as local economic benefits through optimal use of new water supply and prioritization of local employment.		
Recommended/Best Practice Optimisation Measures	Person responsible for Implementation	Timeframe of Implementation
a) Water Resource Management: TNPA to utilise the new water supply provided by the desalination plant strategically, to strengthen the port's resilience against fluctuations or interruptions in municipal water and electricity services. This includes optimising storage, scheduling use during peak demand or supply constraints, and ensuring efficient distribution to reduce reliance on external utilities.	Contractor/ Developer	Throughout Operational Phase
b) While plant operation will not result in the direct creation of any new job opportunities (all plant operations will be conducted by the existing appointed specialists), it is possible that indirect employment opportunities may be created within the port, due to improved port functioning/capacity. Should TNPA utilise a "Local-First" employment policy (if and where possible) for general port hiring processes, then the potential local socio-economic benefits realised through the creation of these indirect employment opportunities would increase.		Local Employment Policy to be considered prior to Operation

7.16 VISUAL CONSIDERATIONS

Impact Management Outcome: Minimise visual impacts emanating from light reflections off solar panels/ buildings and disruption to the general visual landscape, through appropriate design controls and solar panel material selection.			
Essential Management Actions/Mitigation Measures	Person responsible for Implementation	Timeframe of Implementation	of
c) Non-reflecting (matt)/ scattering solar panels must be used, in order to reduce the potential harm or disturbance associated with sunlight reflecting off the panels.	Engineers/ Contractor	During planning phase to ensure ongoing compliance during operation	

- d) If possible, neutral/ earth colours should be used for buildings, so as not to overly reflect sunlight and cause disturbance/ harm to observers. This will also help to preserve the overall character and sense of place of the area.

8 DECLARATION

The proponent or applicant or holder of EA affirms that they will abide and comply with the prescribed impact management outcomes and actions as stipulated in Section 5, Section 6 and Section 7 of this EMPr and have the understanding that the impact management outcomes and actions are legally binding.

Signature of Proponent/applicant/ holder of EA

Date:

The Contractor affirms that they will abide and comply with the prescribed impact management outcomes and actions as stipulated in Section 5, Section 6 and Section 7 of this EMPr and have the understanding that the impact management outcomes and actions are legally binding.

Signature of Contractor

Date:

9 APPENDICES

9.1 APPENDIX I CV OF EAP

9.2 APPENDIX 2 SENSITIVITY MAPS

9.3 APPENDIX 3 COORDINATES FOR THE DEVELOPMENT AND ALL ASSOCIATED COMPONENTS

9.4 APPENDIX 4 METHOD STATEMENT METHODOLOGY GUIDELINE

Overview

This section serves as a guideline on how method statements should be drafted. Section 5, Section 6 and Section 7 outline the management actions and desired outcomes for the various aspects of the project (e.g., noise, fire, heritage management, etc) and should be used to guide the preparation and drafting of the method statements.

To ensure that everyone can understand the method statements, they must be written in plain English. Consequently, a well-considered and well-written method statement that offers precise and succinct work plans can save a great deal of time and money and possibly even avert incidents and accidents.

The method statement needs to be development- and site-specific. Method statements that replicate information from specifications, other documents, or the EMPr are not acceptable because they don't show the person in charge of document approval that the contractor understands exactly what's expected of them.

The ECO must conduct an audit of the method statements' implementation. As a result, the method statements must include enough information and specifics to reassure the ECO that the works will be carried out correctly and that any potential incidents or accidents will be controlled.

Purpose

The purpose of the method statement is to:

- Outline the safe manner in which the task / activity is to be undertaken;
- Provide induction material for all undertaking the task / activity to understand;
- Meet legal requirements – hazard identification and control;
- Provide a programme against work, material, time, staff and anticipated problems are to be managed; and,
- Act as a tool in quality assurance.

The Method Statement shall cover applicable details with regard to:

- procedures;
 - materials and equipment to be used;
 - getting the equipment to and from site;
 - how the equipment/ material will be moved while on site;
 - how and where material will be stored;
 - the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
 - Waste management system that will be implemented;
 - timing and location of activities;
 - compliance/ non-compliance with the EMPr;
 - In the case of for example the search and rescue of animals, a step-by-step explanation of how it will be done, equipment used, people to be consulted, contacted to assist, etc; and
-

- any other information deemed necessary by the ECO.

Scope

A method statement describes the scope of the intended task / activity in an easy-to-understand step – by – step manner. This is especially crucial to lessen the possibility of misunderstandings and ambiguity among the staff members who will be putting it into practice.

The method statement should clearly indicate:

- What — a brief concise description of the task / activity to be undertaken;
- Who — a brief concise description of the personnel involved with undertaking the task or activity;
- When — a brief concise description of the sequence of actions with due commencement and completion dates of the task / activity to be undertaken;
- Where — a brief concise description and map / drawing of the locality of the task / activity to be undertaken;
- Why — a brief concise description of the importance and requirement of the task / activity to be undertaken; and,
- How — a brief concise description of the methods to be implemented, materials and equipment to be used for the task / activity.

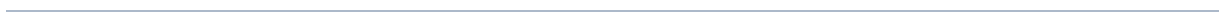
Minimum Requirements

The method statement should as a minimum address the following:

- Description
 - Provide a brief and concise description of the work to be undertaken;
 - Personnel Qualifications and Experience;
 - List all the details of qualifications and experience required for the completion of the task; and
 - Experience may cover previous work done in the area that may not require certificates or licences.
- Personnel, Duties and Responsibilities
 - Give details of the duties and specific responsibilities of supervisors and other personnel. For example, describe such things as daily toolbox talks and guidance provided by the Environmental Officer;
 - Training required to complete work; and
 - Make sure that all workers and their supervisors are trained in the procedures needed to complete the job safely and in an environmentally responsible way, especially when undertaking tasks for the first time or where new or changed work methods are utilised.

- Programme
 - Provide a clear and concise programme indicating all phases and time frames associated with the task.
- Sequence and method
 - Indicate all steps associated with task at hand. This shall be done in a manner which is easily understandable and leaves no uncertainties to staff that are required to implement the task in the field.
- Possible Hazards
 - Include all possible hazards such as: Hazardous substances, explosives, dust, etc ; Hazards to others in area ; and Rubbish, electrical, fills.
- Resources/Plant/Equipment
 - List resources, plant and equipment that you will use on the job, e.g. ladders, scaffold etc.
- Environmental
 - Indicate environmental management responsibilities;
 - Provide aspects and impacts associated with the activity;
 - Provide environmental guidelines; and
 - Specify employee training and involvement.
 - Waste management and reduction;
 - Buildings, machinery, soil;
 - Residual materials and waste;
 - Atmospheric emissions, noise and odour pollution;
 - Wastewater;
 - Accidents and accident prevention; and
 - Transport.
- Health and Safety
 - List all safety controls such as MSDS;
 - Warning Signs;
 - Personal protective equipment;
 - Storage of materials and equipment;
- Fellow workers/public safety provisions; and Housekeeping

9.5 APPENDIX 5 ASPECTS, IMPACTS AND RISK ASSESSMENT REGISTER



10 ANNEXURES

10.1 ANNEXURE A: ENVIRONMENTAL AUTHORISATION

10.2 ANNEXURE B: APPROVED SITE LAYOUT



10.3 ANNEXURE C: APPROVED METHOD STATEMENTS

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