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# REPORT:

## UPGRADE OF THE FUEL RAILWAY LINE IN WALVIS BAY AMENDMENT REPORT

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PROJECT NUMBER: ECC-34-434-REP-02-D

REPORT VERSION: REV 01

DATE: 06 DECEMBER 2022

Prepared by:



**TITLE AND APPROVAL PAGE**

Project Name: Upgrade of the fuel railway line in Walvis Bay amendment report

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Report Version: Rev 01

Status of Report: Draft for Government submission

Project Number: ECC-34-434-REP-02-D

Date of issue: 06 December 2022

Review Period NA

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## **EXECUTIVE SUMMARY**

Environmental Compliance Consultancy has been engaged by Bigen Infrastructure Services Namibia (Pty) Ltd on behalf of the Ministry of Works and Transport the Proponent, as their environmental assessment practitioner to conduct the environmental clearance certificate amendment application process in terms of the Environmental Management Act No. 7 of 2007 for the proposed upgrade of the railway fuel line in Walvis Bay, Erongo Region, Namibia.

An environmental clearance certificate for the upgrade of the existing railway line between Walvis Bay and Kranzberg stations (210 km) was granted in October 2017 (see Appendix F) by the Ministry of Environment, Forestry and Tourism. The need for this upgrade was to improve the safety of the railway line, travel times, improve axle loads and meet the minimum requirements of the South African Development Community railway standards. In 2018 it was determined that an amendment was required to the environmental clearance as a result of design development of the railway line, namely focusing on bridges. The amendment application was successful and the environmental clearance was granted in November 2018 (see Appendix F). The environmental clearance certificate for the Project was renewed on the 30 November 2020 and is valid until 30 November 2023 (see Appendix F). Further to this, it has been determined that an amendment is required for the current environmental clearance to include the upgrade of the fuel railway line in Walvis Bay. The proposed Project includes the upgrade of approximately 6 210 m length of track of the current fuel line from the Port of Walvis Bay (NamPort) to the bulk fuel supplier's infrastructure, and inland.

The original scoping report (Appendix D), environmental management plan (EMP) (Appendix A) and environmental clearance certificate (Appendix F) are still valid and cover the proposed railway upgrade works (i.e. the majority of the planned work and construction). This report describes only the potential environmental and social impacts of the additional work and EMP conditions related and applicable to these departures from the construction related to the original railway upgrade.

The following topics were considered during the scoping phase and further assessed for the amendments required:

- Surface water and drainage
- Landscape (visual impacts)
- Socioeconomic (employment, local businesses, community, land use)
- Noise
- Human environment (infrastructural services, traffic and transport)
- Air quality (including dust)
- Cultural heritage resources (namely historical cemetery)
- Cumulative impacts

After evaluating and assessing these aspects and potential impacts, it was determined that all adverse impacts sensitivity is of a low to minor significance. A beneficial major socioeconomic impact was noted for local business with the upgrades to the fuel line that will improve the efficiency of the product being transported from the harbour (NamPort) to the bulk infrastructure suppliers/users and inland. This will have a positive impact nationally.

It was assessed that the potential impact to the historical cemetery to the west of the site in the vicinity of the bulk fuel suppliers is minor. The servitude of the construction activities will not impede on this cemetery and mitigation measures in the EMP are specified and will be implemented. The Walvis Bay Municipality has been engaged and are informed of the planned upgrade works in proximity to this heritage site.

Through analysis and identification of mitigation and management methods, the assessment concludes that the likelihood of significant environmental impact due to these amendments is low. Various best practice and mitigation measures have been identified to avoid and reduce effects as far as reasonably practicable, as well to as ensure the environment is protected and unforeseen effects are avoided.

On this basis, it is of the opinion of ECC that a revised environmental clearance certificate could be issued, on condition that the management and mitigation measures specified in the original environmental management plan (Appendix A) are implemented and adhered to.

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**TERMS AND ABBREVIATIONS**

| <b>ABBREVIATIONS</b> | <b>DESCRIPTION</b>                              |
|----------------------|---|
| BISN                 | Bigen Infrastructure Services Namibia (Pty) Ltd |
| EAP                  | environmental assessment practitioner           |
| ECC <sub>1</sub>     | environmental clearance certificate             |
| ECC <sub>2</sub>     | Environmental Compliance Consultancy            |
| EMA                  | Environmental Management Act, No.7 of 2007      |
| EMP                  | environmental management plan                   |
| ESIA                 | environmental and social impact assessment      |
| I&APs                | interested and affected parties                 |
| kg/m                 | kilogram per metre                              |
| km                   | kilometre                                       |
| m                    | metre   |
| mm                   | millimetre                                      |
| MEFT                 | Ministry of Environment, Forestry and Tourism   |
| MoWT                 | Ministry of Works and Transport                 |
| NamPort              | Namibian Port Authorities                       |
| PPE                  | personal protective equipment                   |

| ABBREVIATIONS | DESCRIPTION                         |
|---------------|-------------------------------------|
| SADC          | South African Development Community |



## 1 INTRODUCTION

### 1.1 BACKGROUND

Environmental Compliance Consultancy (ECC<sub>2</sub>) has been engaged by Bigen Infrastructure Services Namibia (Pty) Ltd (BISN) on behalf of the Ministry of Works and Transport (MoWT), the Proponent, as their environmental assessment practitioner (EAP) to conduct the environmental clearance certificate amendment application process in terms of the Environmental Management Act No. 7 of 2007 (EMA) for the proposed upgrade of the railway fuel line in Walvis Bay, Erongo Region, Namibia.

An environmental clearance certificate (ECC<sub>1</sub>) for the upgrade of the existing railway line between Walvis Bay and Kranzberg stations (210 km) was granted in October 2017 (see Appendix F) by the Ministry of Environment, Forestry and Tourism (MEFT). The need for this upgrade was to improve the safety of the railway line, travel times, improve axle loads and meet the minimum requirements of the South African Development Community (SADC) railway standards. In 2018 it was determined that an amendment was required to the ECC<sub>1</sub> as a result of design development of the railway line, namely focusing on bridges. The amendment application was successful and the environmental clearance was granted in November 2018 (see Appendix F). The ECC<sub>1</sub> for the Project was renewed on the 30 November 2020 and is valid until 30 November 2023 (see Appendix F). Further to this, it has been determined that an amendment is required for the current environmental clearance to include the upgrade of the fuel railway line in Walvis Bay. The proposed Project includes the upgrade of 6,210 m length of track of the current fuel line from the Port of Walvis Bay (NamPort) to the bulk fuel supplier's infrastructure, and inland.

The original scoping report (Appendix D), environmental management plan (EMP) (see Appendix A) and ECC<sub>1</sub> (Appendix F) are still valid and cover the proposed railway upgrade works (i.e. the majority of the planned work and construction). This report describes only the potential environmental and social impacts of the additional work and EMP conditions related and applicable to these departures from the construction related to the original railway upgrade.

### 1.2 ENVIRONMENTAL REQUIREMENTS

The Environmental Management Act, No.7 of 2007 (EMA) and associated 2012 Regulations, stipulates that an environmental clearance certificate is required to undertake listed activities under the Act and associated Regulations. During the initial environmental and social impact assessment (ESIA) process, the railway Project was screened and has triggering various listed activities, as agreed with the Ministry of Environment, Forestry and Tourism (see Section 1.3 of the Environmental scoping report (Hartz, C., 2017)).

The original environmental clearance certificate does not include the upgrade of the fuel railway line in Walvis Bay, therefore in accordance with Section 39 of the EMA, an amendment to the

conditions of environmental clearance certificate is required. Table 1 provides an overview of the listed activities identified for the Project.

**Table 1 – Listed activities triggered by the Project**

| Listed activity   | ESIA screening finding   |
|---|--|
| <p><b>Waste management, treatment, handling and disposal activities</b></p> <p>(2.1) The construction of facilities for waste sites, treatment of waste and disposal of waste.</p> <p>(2.3) The import, processing, use and recycling, temporary storage, transit or export of waste.</p>   | <ul style="list-style-type: none"> <li>– Waste generated during construction will mainly be solid waste and general waste and will be removed by either a skip or placed in bags and removed by construction vehicles.</li> <li>– Waste will be disposed of at the nearest registered landfill site in Walvis Bay or recycling company.</li> <li>– Portable toilet/chemical toilets and established facilities at the construction offices/camp (either to main sewage system in Walvis Bay or a septic tank) will be used during construction activities.</li> </ul>  |
| <p><b>Forestry activities</b></p> <p>(4.) The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorisation in term of the Forest Act, 2001 (Act No. 12 of 2001) or any other law.</p>   | <ul style="list-style-type: none"> <li>– Limited vegetation clearing may be required for earthworks/perway construction activities.</li> <li>– Permits will be applied for where and if required.</li> </ul>   |
| <p><b>Hazardous substance treatment, handling, storage and transportation of fuel</b></p> <p>(9.2) Any process or activity which requires a permit, licence or other form of authorisation, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, licence or authorisation or which requires a new permit, licence or authorisation in terms of a law governing the generation or release of emissions, pollution, effluent or waste.</p> | <ul style="list-style-type: none"> <li>– Portable toilet/chemical toilets and established facilities at the construction offices/camp (either with a septic tank or connected to the main Walvis Bay sewage treatment system) will be used during construction activities.</li> <li>– Hazardous waste generated during construction activities will be disposed at the Walvis Bay registered landfill site.</li> <li>– Where large hydrocarbon spills have occurred, they will be treated <i>in-situ</i> before disposal consideration.</li> <li>– The existing fuel railway line will be upgraded and amendment required to the ECC.</li> </ul> |

### 1.3 PURPOSE OF THIS REPORT AND TERMS OF REFERENCE

The purpose of this report is to present the findings of an ESIA of the additional components to the railway Project, which shall be submitted to MEFT as part of the amendment application to the current valid environmental clearance certificate (Appendix F).

The environmental and social assessment and this environmental amendment report have been conducted and prepared in accordance with the EMA and the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011) gazetted under the Environmental Management Act, 2007 (Act No. 7 of 2007) (referred to herein as the ESIA Regulations).

This amendment report has been prepared by Environmental Compliance Consultancy (ECC<sub>2</sub>). ECC's terms of reference for the assessment was to address potential impacts that may occur as a result of the construction and operation of the upgrade of the fuel railway line, whether positive or negative, and their relative impact of significance. In addition, explore alternatives for the amendments, for technical recommendations and identify appropriate mitigation measures.

An environmental and social assessment for the railway scheme from Walvis Bay to Kranzberg Stations has been undertaken as part of the original environmental clearance certificate application in 2017 (Hartz, C., 2017). The original scoping report (Appendix D) sets out the need and justification, legal framework, full Project description, environmental and social baseline, Project alternatives, consultation process and assessment findings for the full scheme. To avoid repetition, the scoping report has been used as a foundation to develop this amendment report and therefore should be read in conjunction.

The upgrades to the fuel railway line will be the same construction and operational methodology employed as described in the scoping report, with specific design requirements that will be discussed further in section 2 and assessed in section 3 of this report.

In particular, the legal framework, full Project description, baseline, consultation process and assessment findings have not been repeated in this report. Appendix B provides an overview of the public consultation workshop held by the MoWT and applicable for this amendment report.

This report presents a focussed environmental and social assessment on the amendments of the railway Project based on the scoping exercise presented in the scoping report.

In addition to the environmental and social assessment, the amended 2018 EMP has been updated to incorporate the inclusion of the fuel railway line and any newly required mitigation measures, as required under the EMA and associate Regulations.

### 1.4 ENVIRONMENTAL CONSULTANCY

Environmental Compliance Consultancy (ECC), a Namibian consultancy registration number 2013/11401, has prepared this document on behalf of the Proponent. ECC operates exclusively in the environmental, social, health and safety fields for clients Namibia in the public and private

sector. ECC is independent to the Proponent and has no vested or financial interested in the proposed project. The CVs of the authors of this report are contained in Appendix C.

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## 1.5 PROPONENT DETAILS

Table 2 provides an overview of the contact details of the Proponent (MoWT) and the Proponents representative (BISN).

**Table 2 – Summary of the Proponent and Proponent’s representative personnel contact details**

| <b>Role</b>               | <b>Contact Details</b>  |
|---------------------------|---|
| Proponent                 | Ministry of Works and Transport<br>Contact Person: Mr. Robert Kalomho<br>Contact Number: 061 208 8700<br>Email: <a href="mailto:Robert.Kalomho@mwt.gov.na">Robert.Kalomho@mwt.gov.na</a>        |
| Engineer’s representative | Bigen Infrastructure Services Namibia (Pty) Ltd<br>Contact Person: Mrs. Hanli Bothma<br>Contact Number: 081 164 7071<br>Email: <a href="mailto:Hanli.Bothma@bigen.na">Hanli.Bothma@bigen.na</a> |

## 1.6 REPORT STRUCTURE

Table 3 provides an overview of the structure of this ESIA amendment report.

**Table 3 – ESIA report sections**

| Section | Title                                      | Content  |
|---------|--|--|
| 1       | Introduction                               | Introduction to the amendments needed to the ECC.  |
| 2       | Project description                        | Brief description of the railway upgrade Project for which the amended ECC <sub>1</sub> has already been received and amendments required for the upgrade of the additional fuel railway line in Walvis Bay. |
| 3       | Environmental and social impact assessment | The environmental and social impact assessment covering impacts associated with the amendments not covered in the original scoping report (Hartz, C., 2017)  |
| 4       | Conclusions and recommendations            | Conclude the findings of the amended ESIA/scoping report.  |
| 5       | References                                 | A list of reference used for this report.  |
| 6       | Appendices                                 | Supporting appendices.   |

## 2 PROJECT DESCRIPTION

### 2.1 UPGRADE OF THE FUEL RAILWAY LINE

#### 2.1.1 EXISTING RAILWAY LINE

The existing fuel (diesel and petrol) railway line located between the harbour of Walvis Bay (NamPort) and the bulk fuel infrastructure suppliers that is required to be upgraded is approximately 6 210m (length of track). The servitude is generally 60 m wide, but narrower in sections of Walvis Bay where there is urban infrastructure and other allocated services (e.g. sewage, roads).

The existing railway line needs to be upgraded owing to safety concerns/risks, the line reaching end of life, current components not maintainable (need to be upgraded and standardized), poor operational and drainage conditions:

- Rails are a combination of 30, 40 and 48 kg/m.
- Rails are in a very poor condition and at end of life.
- Sleepers are mostly wooden without a proper ballast bed.
- Super structures are embedded in water channels resulting in pumping, uneven surface and potential derailments.
- Turnouts in a very poor condition causing difficult operational conditions.
- Old turnouts still in track, vandalized for maintenance and contributing to the risk of derailments.

Figure 1 to Figure 6 provides a visual overview of the current conditions of the railway line.



**Figure 1 – Condition of the upgraded railway line (left) in comparison to the fuel line (far right), with NamPort in the background.**



**Figure 2 - Condition of the upgraded railway line (middle and right) in comparison to the fuel line (left), leaving NamPort.**



**Figure 3 - Condition of the fuel line turnout, leaving NamPort.**



**Figure 4 - Condition of the fuel line. On the far right the upgraded railway line.**



**Figure 5 - Safety concerns on the track for the rails of the TransNamib locomotives.**





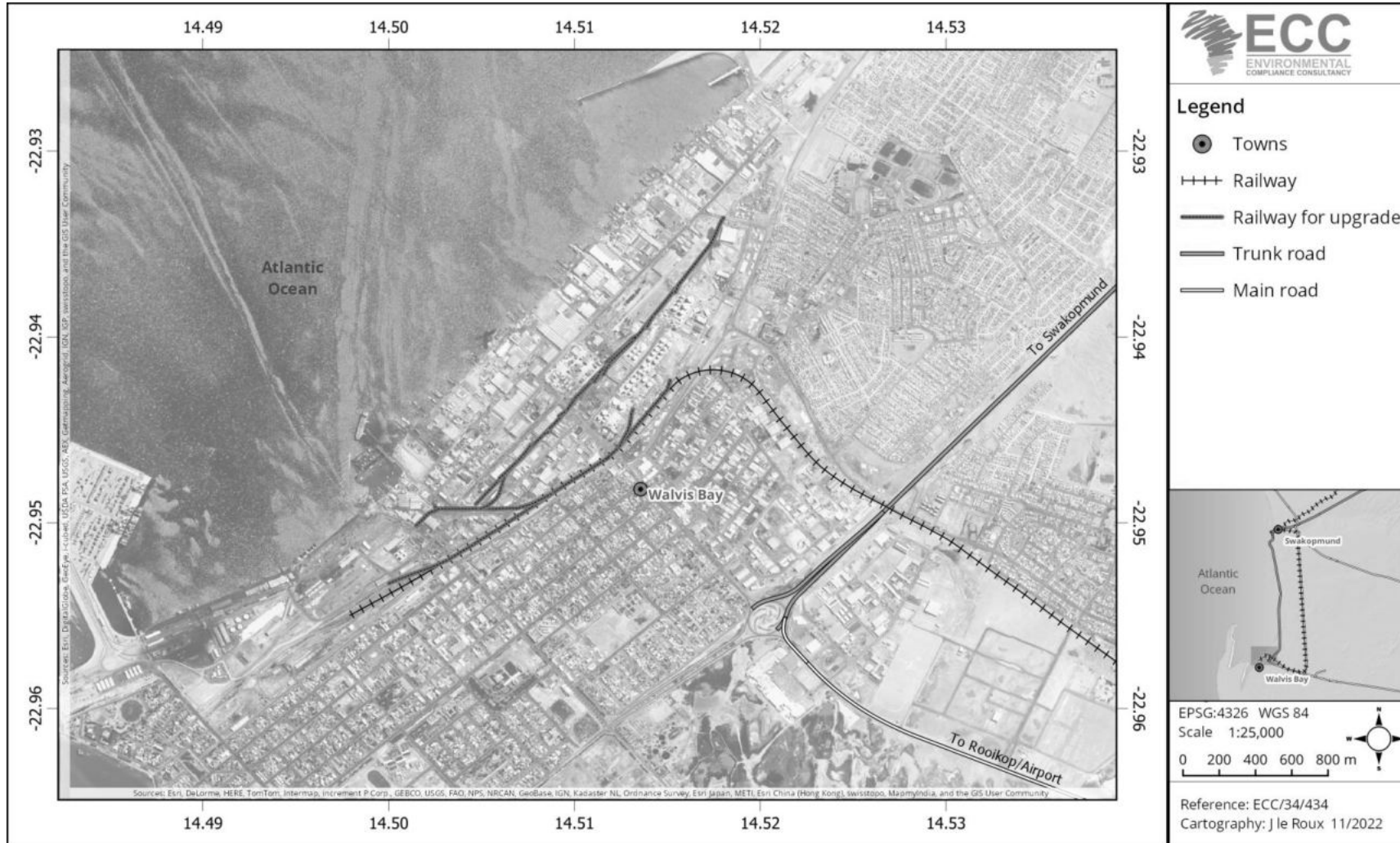
**Figure 6 – Conditions of the track at the entrance to the bulk supplier’s infrastructure.**

#### 2.1.2 RAILWAY UPGRADES

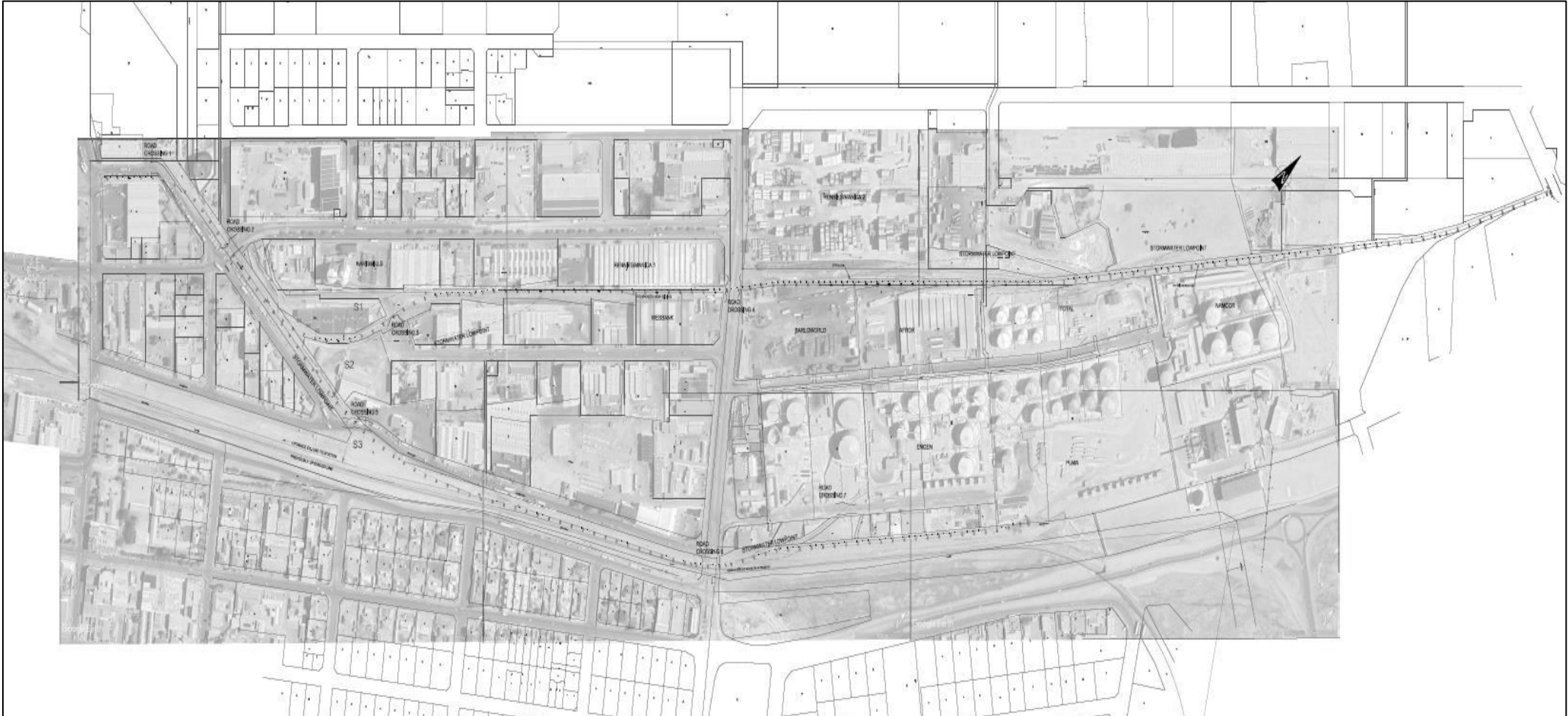
The current scope of works for the upgrades to the railway line of the proposed Project include the following:

- Length of track = 6 210 m
- Length of rail = 12 420 m
- Number of concrete sleepers required = 8871
- Number of 1:9 LH turnouts = 10
- Number of 1:9 RH turnouts = 8
- Number of level/road crossings = 9
- Length of level/road crossings = 140 m
- New SB layer to be constructed with ballast stone after excavation of 300 mm
- Formalize drainage at the five identified stormwater low points
- New 48 kg/m, R260,18 metre rails to be used
- Supply and install track signage, markers and boards
- Reduce level crossings to limit interaction with public where possible

Figure 7 provides a locality and servitude map of the railway line to be upgraded within Walvis Bay. Figure 8 provides the survey map of the various sections to be upgraded. This includes level crossings, stormwater low points, sidings and the division phases of the work package (S1, S2 and S3).



**Figure 7 - Locality map and servitude of the railway line in Walvis Bay.**



**Figure 8 – Survey map of the upgrade works of the railway fuel line in Walvis Bay, divided into the three work sections (Source: BISN).**

The only alternative to the proposed Project would be to investigate construction of a new railway line on a new route in Walvis Bay. Given the existing tracks, infrastructure, servitude and general access routes for the railway already exist in Walvis Bay, and the majority of the environmental disturbance has already been caused, the impacts associated with upgrading will be limited in comparison to constructing a new railway route. The railway line is located in the industrial area, which is a built-up area and therefore there is no additional space for a different route. The no-go option would be to not conduct any upgrade works.

## 2.2 PROPOSED AMENDMENTS

### 2.2.1 REQUIREMENT FOR AMENDMENTS

Since the issuing of the amended environmental certificate in 2018, the scope for upgrading the railway Project has evolved and it was determined the need to include one amendment required for the Project, which is the requirement to upgrade the fuel railway line in Walvis Bay. The fuel line is an additional railway line not forming part of the original scope of the 210 km railway line that is currently being upgraded from Walvis Bay to Kranzberg stations.

The upgrades required to this railway line as described in section 2.1.2, do not differ from the current scope of works assessed as part of the original scoping report (Hartz, C., 2017 – Appendix D) approved under the current valid environmental clearance certificate for the Project. The existing railway line passes through disturbed and built-up areas within the industrial area of Walvis Bay. Other infrastructure also falls within the railway servitude, being roads, power lines, sewage systems etc.

This additional railway line was not included in the original environmental clearance and therefore is assessed as part of this amendment report.

### 2.2.2 PROJECT SCHEDULE

The upgrade works required for this Project are planned to commence when the upgrade of the current section from Arandis to Kranzberg Station is finalised and handed over to TransNamib. This is currently envisaged to be in February/March 2023, with the Project construction concluding in October 2023 and the Project handed over formally to TransNamib in November 2023. Therefore, the construction works on the upgrade on the fuel line is expected to be 7 to 8 months.

The construction work has been divided into three sections, S1, S2 and S3. S1 makes up the longest section of rail and will be worked on first, followed by S2 and ending with S3. Each section will need to be snagged and signed off by BISN and the MoWT before final hand over to TransNamib can take place.

---

### 2.2.3 CONSTRUCTION

The upgrades work required for the Project shall be undertaken within the existing railway servitude. Existing service roads will be used when transporting construction materials to site. If laydown areas are required to store ballast or other materials outside of the existing servitude, this will have to be arranged and discussed with the Municipality of Walvis Bay. The plan is for the above work to be achieved under track occupations, while allowing the railway line to continue operating during the construction period. Track occupations will be agreed with TransNamib, as currently done for the upgrade works from Walvis Bay to Kranzberg stations.

The contractor and the engineering representative will determine an appropriate location for the establishment of site offices with the approval of the Municipality of Walvis Bay. The requirements for the establishment of offices and supporting facilities is discussed in the original scoping report (Hartz, C., 2017) and supporting environmental management plan (Appendix A).

Construction activities will take place during the daytime as much as possible to limit and/or avoid unnecessary noise to residents of Walvis Bay. Even though the railway line passes through the industrial area, associated noise impacts can travel far distances to the resident communities.

If road closures are required at the current level crossings, arrangements will be made with the Municipality of Walvis Bay prior to the road closures and community members will be informed with site notices and notices in the local newspapers.

Appropriate chemical portable toilets will be provided to employees for the duration of the construction activities and will be serviced regularly by a registered service provider.

No construction camps are required to be established however security guards might be employed to oversee laydown or storage areas and the appropriate facilities will be provided. The security guard will not cook or make fires within the railway servitude when on shift.

The most significant types of waste to be generated on site will be the old rails and sleepers that will be removed. Rails classified for future re-use will be cut into lengths of 18 meters and transported to storage areas in proximity of Usakos and Kranzberg. These rails will be used by TransNamib in future maintenance of other track. Rails classified as scrap will be transported to a storage site from where it will be auctioned by the Ministry of Works and Transport. As per the original scoping report (Hartz, C., 2017) other waste generated during construction that cannot practically be recycled, will be transported by truck to the nearest, licensed landfill site. Guidance regarding waste management is further discussed in the environmental management plan (Appendix A).

#### 2.2.4 OPERATIONS

During construction operations, people in the near vicinity may be impacted by the noise and air pollution that is generated from these activities. Guidance on noise management is provided in the environmental management plan (Appendix A).

#### 2.2.5 DECOMMISSIONING

Once construction is complete the local construction sites will need to be cleared of all construction and waste material and restored to as close to their original environmental state as possible. Where drainage has been upgraded, these changes will remain as is to improve the flow of water in the built-up areas. Closure of sites will be overseen by the engineering representative. The Independent Environmental Control Officer can facilitate this through “before-and-after” photographs that are submitted to MEFT on Project closure.

### 2.3 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS

A number of limitations and uncertainties were acknowledged during the ESIA process, which are summarised in Table 4, along with the assumptions made to manage them. In line with ESIA best practice, assumptions have been made based on realistic worst-case scenarios, thereby ensuring that the worst-case potential environmental impacts are identified and assessed. The more general environmental impacts are the same as that described for the railway upgrade activities and are covered in the original scoping report (Hartz, C., 2017 – Appendix D) and environmental management plan (Appendix A) and will not differ for this amended portion of the Project.

**Table 4 – Limitations, uncertainties and assumptions**

| Limitation/uncertainty  | Assumption   |
|---|--|
| Disturbance will only occur within the railway servitude area                       | Given the nature of the repairs and construction to be done it is assumed that there will be no environmental disturbance outside of the railway servitude area. If it is required to work outside of the servitude, this must only happen after consultation and approval and where appropriate compensation to the land-owners and where no significant environmental damage will result from the works. |
| Only existing access roads will be used in order to perform the necessary upgrades. | Given the scale of operations and the built-up pre-disturbed area with existing servitudes it is possible as there are existing roads within the railway servitudes and roads going down to the servitudes from the main routes. Should a new access road be necessary it should be constructed in such a manner as to cause the least environmental impact and if outside the servitude                   |

| Limitation/uncertainty  | Assumption   |
|---|--|
|   | only after consultation and approval and where appropriate compensation were paid to the land-owner.   |
| There will be limited noise impact due to the construction on the residents.  | The construction activities are located within the town of Walvis Bay. While general construction is unlikely to create a noise impact, other specific activities might. Examples could include grinding associated with steelwork or concrete and compactors and compressors. This work must only be carried out during normal working hours (between 07:00 – 17:00) and impacts can be minimised by compliance with relevant construction guidelines and the employment of construction management best practices. Should complaints be received then more restricted hours for high noise level activities will need to be implemented by the engineering representative. |
| Spillage of chemicals or diesel, which can reach the groundwater/seawater due to construction or derailment associated with the construction. | Incidents can happen and spillage can occur either during refuelling, normal construction or due to derailment associated with the construction. Suitable measures and responses for these eventualities are covered in the original scoping report (Hartz, C., 2017 – Appendix D) and environmental management plan (Appendix A) for the railroad upgrade Project and will not differ for this amended portion of the Project.  |
| Railway upgrade design specifications.  | BISN at the time of this report was finalising the design for the upgrade works of the railway line, including upgrades to the railway crossings and drainage works. The route to be upgraded will not change from the amendment report scope, however some construction specifications might differ.  |

## 2.4 SUMMARY OF SITE AND SURROUNDING ENVIRONMENT

Table 5 gives a brief description of the sites and environment surrounding the construction upgrade works. Given that the construction will be restricted to the railway line servitude areas the land use is by default for railway use. Therefore, general land use for the immediate surrounds is given. Before and after photos of each site (i.e. after decommissioning) to show that they have

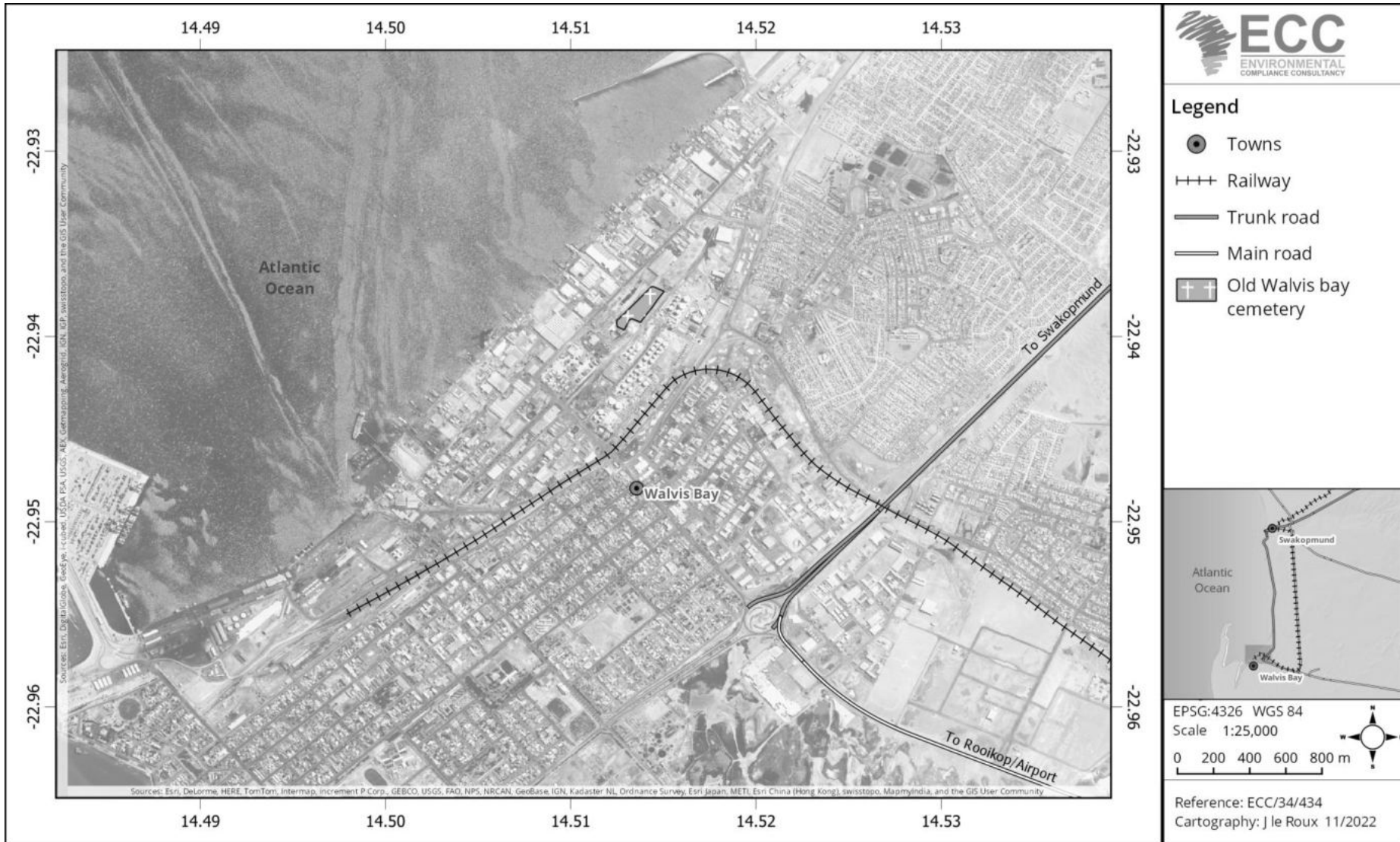
been properly restored should be included in the final environmental performance assessment report to MEFT.

**Table 5 - Summary of the environment of the fuel railway line**

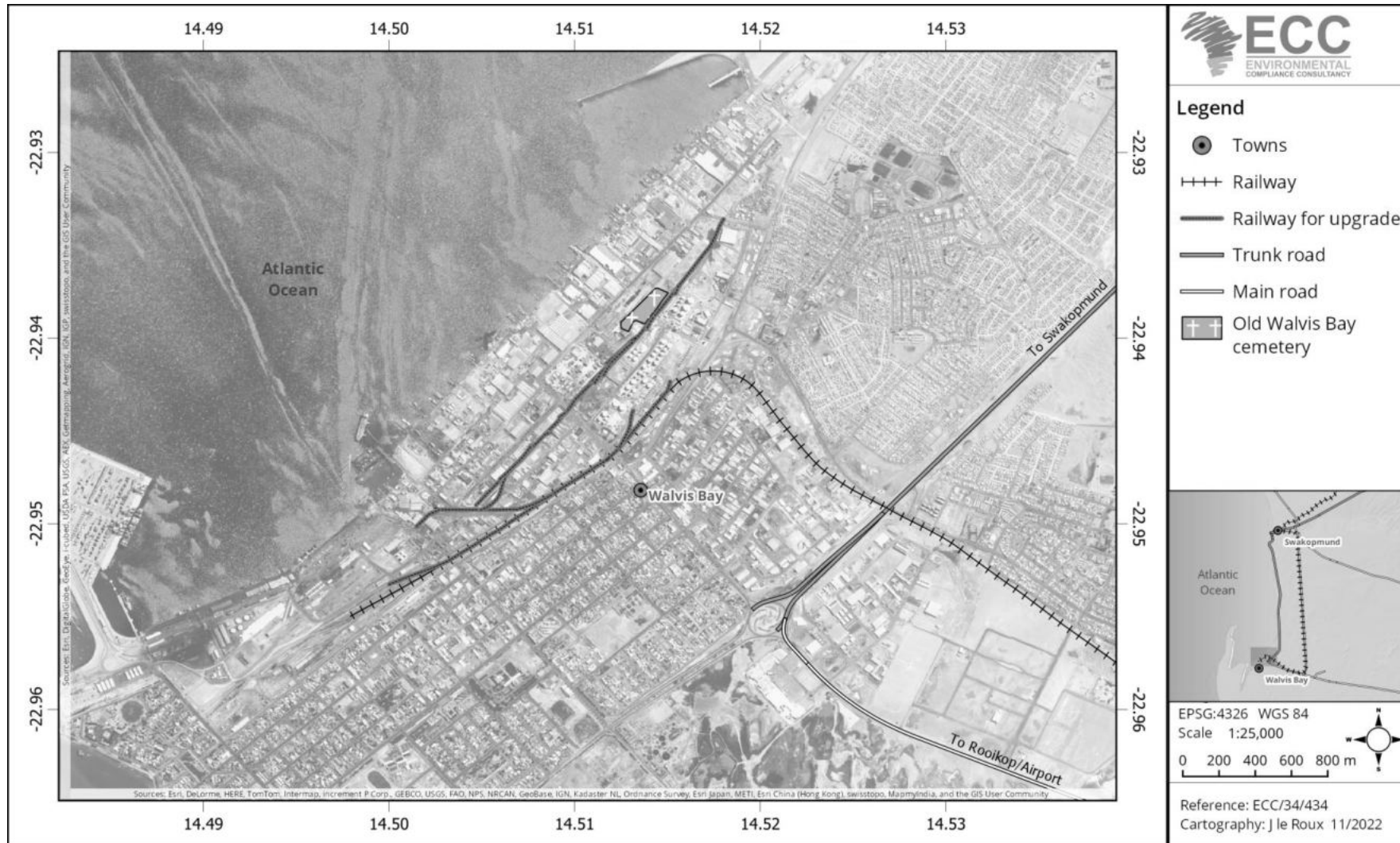
| Summary of the local environment |  |
|----------------------------------|--|
| Land use                         | Servitude of the railway. The area around the railway is mainly for industrial purposes. With residential areas located to the east and southeast of the railway. The old Walvis Bay cemetery is located to the west of the railway servitude at the bulk infrastructure services facilities. This site is classified as a heritage site, however it falls outside of the immediate servitude of the railway line. |
| Climate                          | Desert or arid climate. Mostly cold, humid, wet/fog and windy.   |
| Topography                       | The construction area is flat and previously disturbed, in some areas below sea level.   |
| Surface and groundwater          | Surface water occurs either through influx from seawater or through sporadic rainfall events. The groundwater located in the Walvis Bay area is mainly from the Kuiseb River, however in the construction site, the groundwater is determined as seawater.<br><br>Five stormwater low points have been identified that will need drainage controls implemented during construction.                                |
| Biodiversity and vegetation      | As the area is previously disturbed and compacted, and the high salinity of the soils in Walvis Bay, vegetation is limited in the construction site area. Vegetation however observed in the servitude includes grasses, tamarisks and reeds.  |
| Soils and geology                | Walvis Bay falls generally in a marshland. The proposed construction is in a built up previously disturbed area, so soils have been introduced and it is difficult to determine the original soil type. Soils appear to have a thin cover, very saline and do not drain well. The construction site is very close to the coastline of the Atlantic Ocean (548 m recorded as closest interval).                     |

Figure 9 provides a locality overview of the old Walvis Bay cemetery (Muldrene) that is regarded as a heritage site. Figure 12 provides an overview in relation to the railway line to be upgraded. Figure 12 to Figure 14 provides a visual overview of the condition of the current cemetery, which is mostly dilapidated and it is apparent that residents of Walvis Bay walk through/access these sites. The site is currently closed for burial and is approximately 50 years old. The Municipality of Walvis Bay is still discussing the future plans for this site, due to its locality to the industrial area (personal comms, Mr Joseph Amushila, Walvis Bay Municipality). The site is therefore classified as sensitive and a no-go area by construction and Project staff.





**Figure 9 – Location overview of the old Walvis Bay cemetery (Muldrene) in Walvis Bay.**



**Figure 10 - Location overview of the old Walvis Bay cemetery (Muldrene) in relation to the fuel railway line to be upgraded.**



**Figure 11 - Satellite overview of the old Walvis Bay cemetery (Muldrene) (Source: Google Earth).**



**Figure 12 - Visual overview of the current condition of the Old Walvis Bay cemetery (boundary wall).**



**Figure 13 - Visual overview of the current condition of the Old Walvis Bay cemetery (including wall).**





**Figure 14 – Visual overview of the current condition of the Old Walvis Bay cemetery.**

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## **3 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT**

### **3.1 PURPOSE OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT**

The ESIA process in Namibia is governed and controlled by the Environmental Management Act, No. 7 of 2007 and the ESIA Regulations No. 30 of 2012, which is administered by the Office of the Environmental Commissioner through the Directorate of Environmental Affairs of the MEFT.

An ESIA is a process of identifying, predicting, evaluating and mitigating the potential effects of a proposed project on the natural and socioeconomic environment. The aims of the ESIA process and subsequent report are to apply the principles of environmental management to proposed activities; reduce the negative and increase the positive effects arising from a proposed project; provide an opportunity for the public to consider the environmental impacts of a proposed project through meaningful consultation; and to provide a vehicle to present the findings of the assessment process to competent authorities for decision making.

### **3.2 THE ASSESSMENT PROCESS TO DATE**

The original environmental scoping and environmental management reports (Hartz, C., 2017) for the upgrading of the existing railway line between Kranzberg and Walvis Bay stations were completed and submitted to MEFT. Environmental clearance was granted for the railway upgrade project in October 2017 (see Appendix F). Since the issuing of the certificate, an amendment was conducted in 2018 and approved by MEFT in November 2018 (see Appendix F). The ECC<sub>1</sub> was renewed in November 2020 (see Appendix F). Subsequently, an amendment to the environmental clearance certificate from MEFT is required for the additional railway line upgrade.

### **3.3 ASSESSMENT OF PROPOSED AMENDMENTS**

From an environmental assessment point of view the amendments proposed in this report, namely overlap with the impacts and management plan for the greater railway upgrade. These have already been assessed by MEFT and an environmental clearance certificate granted. Given the similarities and overlap of most of the potential environmental impacts for these amendments, the scoping report should be retained as valid (Hartz, C., 2017 – Appendix D), the Proponent to adhere to the updated environmental management plan (Appendix A) and list only those impacts not, or inadequately, covered and how they should be managed.

### **3.4 ASSESSMENT METHODOLOGY**

#### **3.4.1 INTRODUCTION AND GUIDANCE**

Predication and evaluation of impacts is a key step in the ESIA process. The aims of this assessment will be to determine which impacts are likely to be significant; to scope the available data and identify any gaps that need to be filled; to determine the spatial and temporal scope; and to identify the assessment methodology. The scope of the assessment was determined

through undertaking a preliminary assessment of the proposed Project against the receiving environment, and was obtained through a physical and desktop review, available site-specific literature and information provided by the BISN.

The following principal documents were used to inform the assessment method:

- Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008) and best practice;
- International Finance Corporation (IFC) standards and models, in particular performance standard 1: ‘Assessment and management of environmental and social risks and impacts’ (International Finance Corporation, 2021) for the social environment; and
- International Finance Corporation Cumulative Impact Assessment (CIA) and Management Good Practice Handbook (International Finance Corporation, 2013) for the social environment and overall cumulative impacts, where applicable.

#### 3.4.2 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS

The following limitations and uncertainties associated with the assessment methodology will be considered in the assessment phase:

- Topic specific assessment guidance has not been developed in Namibia. A generic assessment methodology will be applied to all topics using IFC guidance and professional judgement.
- Guidance for CIA has not been developed in Namibia, but a single accepted state of global practice has been established. The IFC’s guidance document (International Finance Corporation, 2013) will be used for the CIA.

#### 3.4.3 ASSESSMENT METHODOLOGY

The ESIA methodology applied to this assessment has been developed by ECC using the International Finance Corporation (IFC) standards and models, in particular performance standard 1: ‘Assessment and management of environmental and social risks and impacts’ (International Finance Corporation, 2017); Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008); international and national best practice; and over 25 years of combined ESIA experience. The methodology is set out in Figure 15 and Figure 16.

The evaluation and identification of the environmental and social impacts require the assessment of the Project characteristics against the baseline characteristics, ensuring that all potentially significant impacts are identified and assessed. The significance of an impact is determined by taking into consideration the combination of the sensitivity and importance/value of environmental and social receptors that may be affected by the proposed Project, the nature and characteristics of the impact, and the magnitude of any potential change. The magnitude of change (the impact) is the identifiable changes to the existing environment that may be negligible, low, minor, moderate, high, or very high; temporary/short-term, long-term or permanent; and either beneficial or adverse.

## ECC IMPACT PREDICTION AND EVALUATION METHODOLOGY

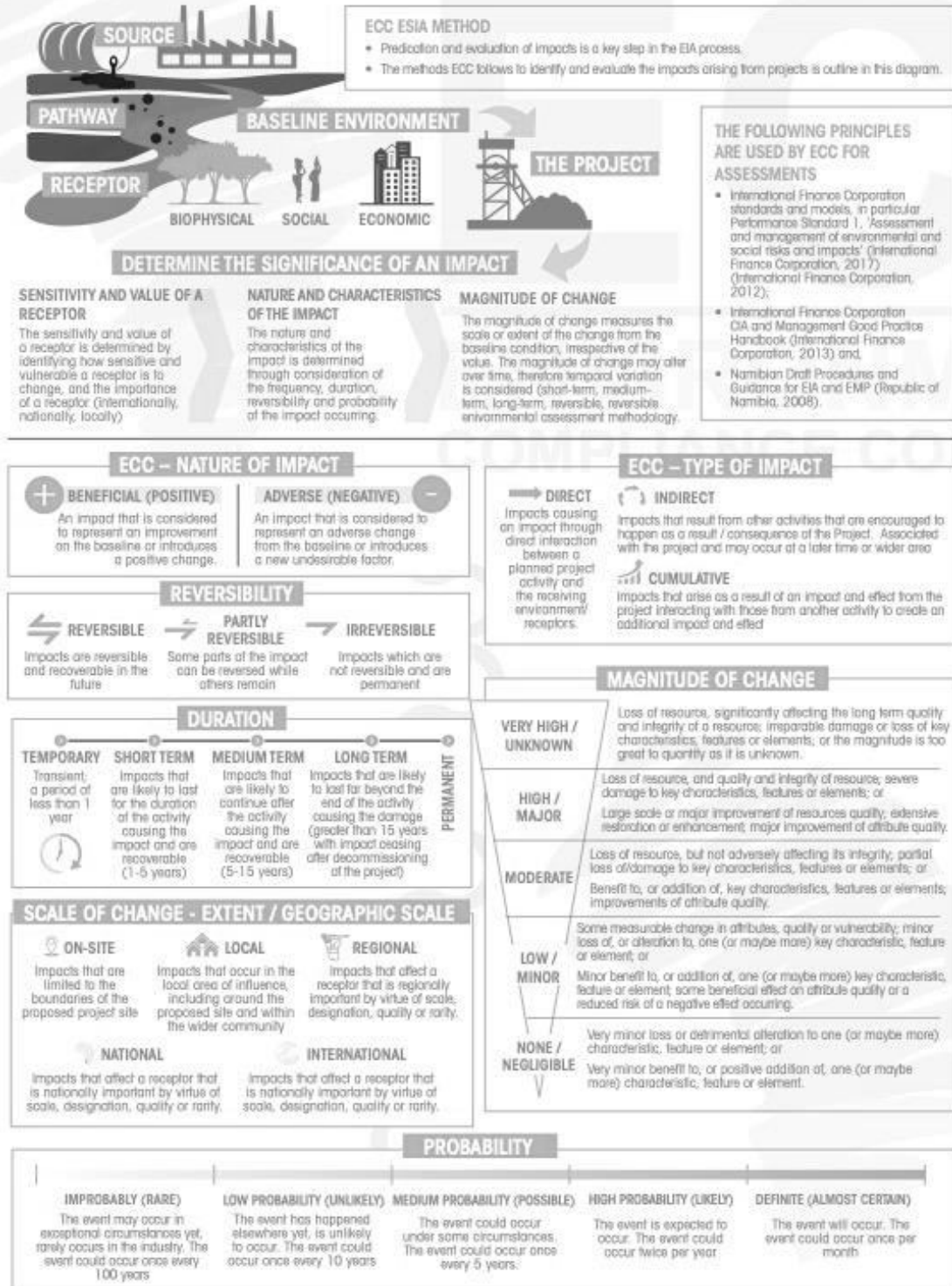


Figure 15 – ECC ESIA methodology based on IFC standards

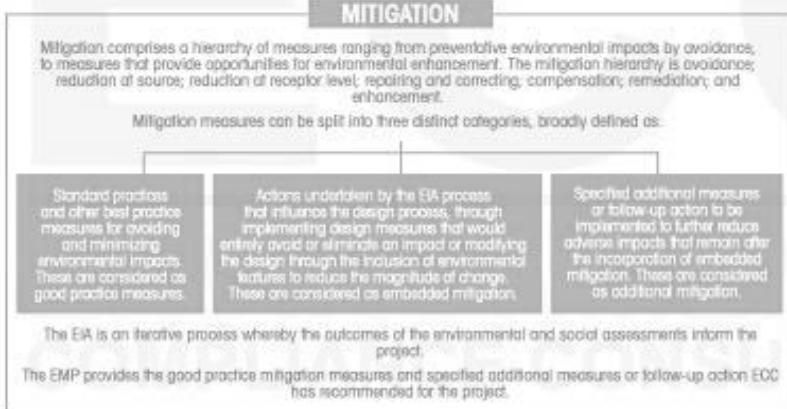


|  |  | SIGNIFICANCE OF IMPACT   |   |  |   |              |              |
|--|--|--|---|--|---|--------------|--------------|
|  |  |  |   |  |   |              |              |
| <ul style="list-style-type: none"> <li>The significance of impacts has been derived of by applying the identified thresholds for receptor sensitivity and magnitude of change, as well as the definition of significance. Moderate and major adverse impacts are considered as significant.</li> <li>The following thresholds were therefore used to double check the assessment of significance had been applied appropriately, a significant impact would meet at least one of the following criteria:               <ul style="list-style-type: none"> <li>It exceeds widely recognized levels of acceptable change;</li> <li>It threatens or enhances the viability or integrity of a receptor or receptor group of concern; and</li> <li>It is likely to be material to the ultimate decision about whether or not the environmental clearance certificate is granted.</li> </ul> </li> </ul> |  | <p>Impacts are considered to be local factors that are unlikely to be critical to decision-making</p>                                      | <p>Impacts are considered to be important factors but are unlikely to be key decision-making factors. The impact will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value. Impacts are considered to be short-term, reversible and/or localized in extent.</p> | <p>Impacts are considered within acceptable limits and standards. Impacts are long-term, but reversible and/or have regional significance. These are generally (but not exclusively) associated with sites and features of national importance and resources/features that are unique and which, if lost, cannot be replaced or relocated.</p> | <p>Impacts are considered to be key factors in the decision-making process that may have an impact of major significance, or large magnitude impacts occur to highly valued/sensitive resource/receptors. Impacts are expected to be permanent and non-reversible on a national scale and/or have international significance or result in a legislative non-compliance.</p> |              |              |
| SEMITIVITY   | Biophysical  | Social   | Low   | Minor (2)  | Moderate (3)  | Major (4)    |              |
| High   | A biophysical receptor that is protected under legislation or international convention (CITES) listed as rare, threatened or endangered IUCN species. Highly valued/ sensitive resource/ receptors.  | Those affected people/ communities will not be able to adapt to changes or continue to maintain pre-impact livelihoods.                    | High (3)  | Minor (3)  | Moderate (6)  | Major (9)    | Major (12)   |
| Medium   | Of value, importance/ rarity on a regional scale, and with limited potential for substitution; and/or not protected or listed (globally) but may be a rare or threatened species in the country, with little resilience to ecosystem changes, important to ecosystem functions, or one under threat or population decline. | Able to adapt with some difficulty and maintain pre-impact status but only with a degree of support  | Medium (2)  | Low (2)  | Minor (4)   | Moderate (6) | Major (8)    |
| Low  | Not protected or listed as common/abundant, or not critical to other ecosystems functions.   | Those affected are able to adapt with relative ease and maintain pre-impact status. There is no perceptible change to people's livelihood. | Low (1)   | Low (1)  | Low (2)   | Minor (3)    | Moderate (4) |

**SENSITIVITY AND VALUE**



**MITIGATION**



**SIGNIFICANCE DESCRIPTION**

- Low - Major Beneficial (All Scores)**  
Impacts are considered to be beneficial to the environment and society.
- Low (negative) 0 - 25**  
Impacts are considered to be local factors that are unlikely to be critical to decision-making.
- Minor (negative) 25 - 50**  
Impacts are considered to be important factors but are unlikely to be key decision-making factors. The impact will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value. Impacts are considered to be short-term, reversible and/or localized in extent.
- Moderate (negative) 50 - 75**  
Impacts are considered within acceptable limits and standards. Impacts are long-term, but reversible and/or have regional significance. These are generally (but not exclusively) associated with sites and features of national importance and resources/features that are unique and which, if lost, cannot be replaced or relocated.
- Major (negative) 75 - 100**  
Impacts are considered to be key factors in the decision-making process that may have an impact of major significance, or large magnitude impacts occur to highly valued/sensitive resource/receptors. Impacts are expected to be permanent and non-reversible on a national scale and/or have international significance or result in a legislative non-compliance.

Figure 16 – ECC ESIA methodology based on IFC standards

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#### 3.4.4 MITIGATION

Mitigation comprises a hierarchy of measures ranging from preventative environmental impacts by avoidance, to measures that provide opportunities for environmental enhancement. The mitigation hierarchy is: avoidance; reduction at source; reduction at receptor level; repairing and correcting; compensation; remediation; and enhancement.

Mitigation measures can be split into three distinct categories, broadly defined as:

1. Actions undertaken by the ESIA process that influence the design process, through implementing design measures that would entirely avoid or eliminate an impact, or modifying the design through the inclusion of environmental features to reduce the magnitude of change. These are considered as embedded mitigation.
2. Standard practices and other best practice measures for avoiding and minimising environmental impacts. These are considered as good practice measures.
3. Specified additional measures or follow-up action to be implemented, in order to further reduce adverse impacts that remain after the incorporation of embedded mitigation. These are considered as additional mitigation.
4. The ESIA is an iterative process whereby the outcomes of the environmental assessments inform the Project.

The EMP (Appendix A) provides the good practice measures and specified additional measures or follow-up action.

Embedded mitigation and good practice mitigation will be taken into account in the assessment. Additional mitigation measures will be identified when the significance of impact requires it and causes the impact to be further reduced. Where additional mitigation is identified, a final assessment of the significance of impacts (residual impacts) will be carried out, taking into consideration the additional mitigation.

### 3.5 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FINDINGS

When undertaking the scoping exercise, the design of the proposed project amendments and best practice measures associated with these changes, were considered to ensure the likely significant effects and any required additional mitigation measures were identified. The following topics were considered during the scoping phase:

- Surface water and drainage
- Landscape (visual impacts)
- Socioeconomic (employment, local businesses, community, land use)
- Noise
- Human environment (infrastructural services, traffic and transport)
- Air quality (including dust)
- Cultural heritage resources (namely historical cemetery)

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- Cumulative impacts

The sections below describe the findings of the assessment phase.

3.5.1 SURFACE WATER AND DRAINAGE

*3.5.1.1 Surface water pooling and poor drainage/run-off*

Stormwater drainage in the current built up environment of the railway servitude is sub-standard, construction activities whilst preparing and constructing the railway line could lead to water pooling in some areas, causing erosion of the railway line being upgraded, cause erosion to neighbouring infrastructure and business or run-off. Additionally, the majority of pooling water observed currently is noted to be sewage water from the Municipality of Walvis Bay's sewage system, this could lead to health issues for construction staff if exposed for long durations and to the public, especially if there are run-off events. BISN will engage the Municipality of Walvis Bay to ensure repairs to these systems are carried out.

Railway construction activities could have an adverse effect on the topography and landscape leading to surface water build up and poor drainage in the receiving environment, however this will be restricted to activities on-site and will not extend beyond the Project site and the duration is considered temporary. The probability of the impact occurring is possible. The receptor is assessed as the topography and landscape of the built environment, the sensitivity of the receptor to accommodate changes associated with this potential impact is determined as low. The magnitude of change is expected to be none/negligible. The significance of the impact is determined as low. Mitigation required includes ensuring that during construction activities drainage is good and water does not pool through pre-planning and daily inspections. Where possible the rail has been lifted to assist with drainage. These measures have been incorporated in the EMP.

*3.5.1.2 Hydrocarbon spillages*

Hydrocarbon spillages can occur during construction activities from the use of locomotive plant or vehicles/trucks in support of the construction activities. As stormwater drainage in the current environment is sub-standard, hydrocarbon spills could pool or runoff in certain areas and infiltrate the top layer of soils and surface water. As seawater level is very low in the construction site, this potential contamination is with surface seawater instead of groundwater.

Railway construction activities could have an adverse on surface water quality through contamination of hydrocarbons, this will be restricted to the local area in and surrounding the Project site and the duration will be temporary. The probability of the impact occurring is highly probable due to the nature of construction activities and incidents do occur. The sensitivity of the surface water to accommodate hydrocarbon contamination is medium if incidents are cleaned up within 24 hours of the spill occurring and potential for further leaching and contamination. The

magnitude of change is low/minor and the water quality should be able to be restored. The significance of the impact occurring is minor. All mitigation measures to deal with hydrocarbon spills and related management is incorporated into the EMP.

### 3.5.1.3 Stormwater low points

Five areas have been identified by BISN as stormwater low points, whereby drainage controls will be implemented through design to prevent water from pooling here and causing erosion. This is currently a major problem for the Municipality of Walvis Bay and honey suckers have to be dispatched to remove the water to prevent further damages to infrastructure and the accumulation of salts. Additionally, the majority of pooling water observed currently is noted to be sewage water from the Municipality of Walvis Bay's sewage system, this could lead to health issues for construction staff if exposed for long durations and to the public. BISN will engage the Municipality of Walvis Bay to ensure repairs to these systems are carried out.

Railway operations will have a beneficial impact on the built environment through design improvements of the fuel railway line to prevent stormwater low points. The impact will be local for the direct railway site and the surrounding built environment and these changes will be permanent. The probability of the impact occurring is definite. The sensitivity of the receptor is medium as if damages occur, then these will need to be corrected by TransNamib in the future through maintenance works. The magnitude of change is none/negligible. The significance of the impact is a beneficial minor.

Table 6 provides an overview of the impact assessment outcomes of surface water and drainage impacts.

**Table 6 – Impact assessment for the railway construction or operations on surface water and drainage.**

| ACTIVITY             | RECEPTOR/S               | IMPACT   | NATURE OF IMPACT                | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|--------------------------|--|---------------------------------|---------------------|---------------------|------------------------|
| Railway construction | Topography and landscape | Stormwater drainage in the current built up environment of the railway servitude is sub-standard, construction activities whilst | Adverse<br>On-site<br>Temporary | Low                 | None/negligible     | Adverse Low (1)        |

| ACTIVITY             | RECEPTOR/S            | IMPACT  | NATURE OF IMPACT                 | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|-----------------------|---|----------------------------------|---------------------|---------------------|------------------------|
|                      |                       | preparing and constructing the railway line could lead to water pooling in some areas, causing erosion of the railway line being upgrade, cause erosion to neighbouring infrastructure and business or run-off. |                                  |                     |                     |                        |
| Railway construction | Surface water quality | Hydrocarbon spillages can occur during construction activities from the use of loco plant or vehicles/trucks in support of the construction activities and cause pollution.                                     | Adverse<br>Local<br>Temporary    | Low/Minor           | Medium              | Adverse Minor (4)      |
| Railway operations   | Built environment     | Five areas have been identified as stormwater low points, whereby drainage  | Beneficial<br>Local<br>Temporary | Medium              | None/negligible     | Beneficial Minor (4)   |

| ACTIVITY | RECEPTOR/S | IMPACT  | NATURE OF IMPACT | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------|------------|---|------------------|---------------------|---------------------|------------------------|
|          |            | controls will be implemented through design to prevent water from pooling here and causing erosion. |                  |                     |                     |                        |

### 3.5.2 LANDSCAPE (VISUAL)

#### 3.5.2.1 *Permanent changes to the landscape as a result of construction activities*

Permanent changes to the landscape will be made during the construction of the upgrade works, this is mostly to improve the drainage in some areas and the level crossings. Where possible the perway will be raised by 100mm. Therefore, this will differ from the current fuel line visual aesthetics. The fuel line will be more visible, especially in areas with level crossings and additional markers and signed will be erected.

The permanent changes from the railway construction could have an impact on the current built environment in Walvis Bay industrial area. The impact will be restricted to the railway line site and will be permanent. The probability of the impact occurring is definite. The sensitivity of the receptor is determined as low as the area is already disturbed. The magnitude of change will be low/minor. The significance of the impact is determined as low.

#### 3.5.2.2 *Visual pollution to Walvis Bay residents and community*

Construction activities could lead to visual pollution to the residents of Walvis Bay. Construction is namely taking place in the industrial area; however residents will be exposed to a proportion of the S1 work package that reside adjacent to this section of railway line works.

The railway construction activities could have an adverse impact on the community, which will be restricted to the direct and surrounding Project site and will only be temporary for the duration of the construction work (5/6 months). The probability of the impact occurring is definite. The sensitivity of the receptors being the community is low and the magnitude of change is none/negligible as activities will take place during the day when the residents are at work and the

construction is mainly located in the industrial area. The significance of the impact is determined as low.

Table 7 provides an overview of the impact assessment outcomes of landscape visual impacts.

**Table 7 – Impact assessment for the railway construction on landscape visual impacts.**

| ACTIVITY             | RECEPTOR/S        | IMPACT  | NATURE OF IMPACT                | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|-------------------|---|---------------------------------|---------------------|---------------------|------------------------|
| Railway construction | Built environment | Permanent changes to the landscape will be made during the construction of the upgrade works, this is mostly to improve the drainage in some areas and the level crossings. The perway will be raised to 300 mm. Therefore this will differ from the current fuel line aesthetics. The fuel line will be more visible, especially in areas with level crossings | Adverse<br>On-site<br>Permanent | Low                 | Low/Minor           | Adverse Low<br>(2)     |

| ACTIVITY             | RECEPTOR/S | IMPACT   | NATURE OF IMPACT              | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|------------|--|-------------------------------|---------------------|---------------------|------------------------|
|                      |            | and additional markers and signs will be erected.                                      |                               |                     |                     |                        |
| Railway construction | Community  | Construction activities could lead to visual pollution to the residents of Walvis Bay. | Adverse<br>Local<br>Temporary | Low                 | None/negligible     | Adverse Low (1)        |

### 3.5.3 SOCIOECONOMIC

#### 3.5.3.1 Employment

The railway construction activities will result in job creation through the construction period and this Project is estimated to last 5 to 6 months. The total amount of jobs that will be created is not confirmed at this time, estimated to be ±200. Sub-contractors will also be employed during the period by the main contractor.

Therefore, railway construction activities will have a beneficial impact on the community, that will create jobs in the local community for a temporary duration (less than 1 year). The probability of the impact occurring is definite and will result in employment. The sensitive of the receptor, being the community, is low, and the magnitude of change moderate, due to the short duration of the planned construction activities. Livelihoods will benefit for the period of construction and the community will be able to cope once the construction activities have ceased. The significance of the impact is determined as a beneficial low.

#### 3.5.3.2 Local business – purchasing of goods and services

The railway construction activities will result in the local purchasing of goods and services throughout the construction period and this Project is estimated to last 5 to 6 months. Local business will benefit from these upgrades by purchasing of local goods and services in Walvis Bay and within the Erongo Region, possibly extending to other part of Namibia, as with the current upgrade Project (e.g. ballast suppliers, construction supplies).



Therefore, railway construction activities will have a beneficial socioeconomic impact on local business and communities, that will have a regional impact but for a temporary duration (less than 1 year). The probability of the impact occurring is definite and will result in local purchasing of goods and services. The sensitive of the receptor, is low, and the magnitude of change moderate, due to the short duration of the planned construction activities. Livelihoods will benefit for the period of construction and the community will be able to cope once the construction activities have ceased. The significance of the impact is determined as a beneficial low.

*3.5.3.3 Local business – product being transported to the bulk fuel infrastructure suppliers/users*

Upgrades made to the railway line will improve the efficiency of the product being transported from the harbour to the bulk infrastructure suppliers/users, and inland during future railway operations. Safety and speed will increase during product delivery. This in turn improves the time for the product to be transported nationally to the depots of the suppliers and in turn generate revenue at a faster scale.

Therefore, railway operations as a result of the planned construction activities will have a beneficial socioeconomic impact to the suppliers that will have a national extent for an expected permanent duration. The probability of the impact occurring is definite. The sensitive of the receptor is medium and the magnitude of change high/major, due to the major improvements the upgrade will have for the bulk suppliers and sell of their product to the Namibian people and travellers and the increased income from an improvement in sales. The significance of the impact is determined as a beneficial major.

*3.5.3.4 Community – residents health and safety*

The current condition of the railway line is sub-standard, and the railway is hardly visible, especially at the seven indicated crossings with public in Walvis Bay. Trains only sound their horns when travelling close to crossings as a warning to the public but there are no physical signs or deterrents in place. Benefits to the servitude upgrades will improve visibility of the railway line, especially at crossings and improve safety to residents during the railway operations.

The upgrades to the railway line will have beneficial impacts to the community health and safety, this will be for the local area where the railway line is located and its associated access crossings and the duration will be long term, as maintenance is expected on these improvement systems. The probability of the improvements is definite. The sensitivity of the receptor, being the community health and safety is low, as the community functions currently with the sub-standard preventative measures in place. The magnitude of change is determined as moderate. This is because the upgrades will have positive qualitative attributes. The significance of the impact is determined as a beneficial minor.

TransNamib will need to ensure maintenance on the systems once the fuel railway line has been handed over, where required during operations, and will be incorporated into the updated EMP.

*3.5.3.5 Community – locomotive operators health and safety*

The current condition of the railway line is sub-standard, and the railway is hardly visible, especially at the seven indicated crossings with public in Walvis Bay. Trains only sound their horns when travelling close to crossings as a warning to the public but there are no physical signs or deterrents in place. Benefits to the servitude upgrades will improve visibility of the railway line, especially at crossings and improve safety to locomotive operators during the railway operations to prevent or avoid accidents and potential derailments.

The upgrades to the railway line will have beneficial impacts to the locomotive operators, this will be for the local area where the railway line is located and its associated access crossings and the duration will be long term, as maintenance is expected on these improvement systems. The probability of the improvements is definite. The sensitivity of the receptor, being the locomotive operators is low, as the operators currently operate with the sub-standard preventative measures in place. The magnitude of change is determined as moderate. This is because the upgrades will have positive qualitative attributes. The significance of the impact is determined as a beneficial minor.

TransNamib will need to ensure maintenance on the systems once the fuel railway line has been handed over, where required during operations, and will be incorporated into the updated EMP.

*3.5.3.6 Land use*

Land use remains the same as the railway forms part of the servitude of TransNamib. Therefore, this impact will not be further assessed.

Table 8 provides an overview of the impact assessment outcomes of socioeconomic impacts.

**Table 8 – Impact assessment for the railway construction on socioeconomic impacts.**

| ACTIVITY             | RECEPTOR/S | IMPACT   | NATURE OF IMPACT                 | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|------------|--|----------------------------------|---------------------|---------------------|------------------------|
| Railway construction | Community  | Job creation through the construction period of this project for 5/6 months. | Beneficial<br>Local<br>Temporary | Low                 | Moderate            | Beneficial Low (2)     |

| ACTIVITY             | RECEPTOR/S                          | IMPACT   | NATURE OF IMPACT                    | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|-------------------------------------|--|-------------------------------------|---------------------|---------------------|------------------------|
| Railway construction | Local business                      | Local business will benefit from these upgrades by purchasing of local goods in Walvis Bay and within Namibia, as with the current upgrade project (e.g. ballast). | Beneficial<br>Regional<br>Temporary | Low                 | Moderate            | Beneficial Low (2)     |
| Railway operations   | Bulk infrastructure suppliers/users | Upgrades to the line will improve the efficiency of the product being transported from the harbour to the bulk infrastructure suppliers/users                      | Beneficial<br>National<br>Permanent | Medium              | High/Major          | Beneficial Major (8)   |
| Railway operations   | Community health and safety         | Benefits to the servitude upgrades will improve visibility of the railway line and improve safety to residents.  | Beneficial<br>Local<br>Long term    | Low                 | Moderate            | Beneficial Minor (3)   |
| Railway operations   | TransNamib train operators          | Benefits to the servitude upgrades will  | Beneficial<br>Local<br>Long term    | Low                 | Moderate            | Beneficial Minor (3)   |

| ACTIVITY | RECEPTOR/S | IMPACT   | NATURE OF IMPACT | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------|------------|--|------------------|---------------------|---------------------|------------------------|
|          |            | improve the safety of the railway for the locomotive operators |                  |                     |                     |                        |

### 3.5.4 NOISE

#### *3.5.4.1 Noise pollution to Walvis Bay residents and community*

The railway construction activities will generate noise and have potential noise pollution impacts on the community and residents of Walvis Bay. Activities will take place during the day and residents are not allowed into the construction site. Operational activities will not change from the current environment and therefore does not need to be assessed further in this report.

Railway construction activities could have an adverse impact on the Walvis Bay community, this will have a local extent on the Project site and immediate surrounding environment, that will be for a temporary duration for the period of construction (5/6 months). Noise will be generated during construction activities, so this probability is definite. The sensitivity of the receptor is low and the magnitude of change is low/minor, as activities are only planned for the day when residents are at work and the majority of the railway upgrades is to take place in the industrial area, where there are already existing associated noise impacts. Additionally, residents may not enter the construction site without approval and the required inductions. The significance of the impact is determined as low.

Mitigation measures discussed above is incorporated into the existing EMP and no amendments are therefore required.

#### *3.5.4.2 Noise impacts to construction workers*

The railway construction activities will generate noise and have potential noise pollution impacts on the construction workers working with or in the vicinity of heavy machinery and not wearing the appropriate personal protective equipment (PPE).

Railway construction activities could have an adverse impact on construction workers, this will have a local extent on the Project site and immediate surrounding environment, that will be for a permanent duration to an employee if there is noise induced hearing loss. Noise will be generated during construction activities, all staff receive induction and are issued with hearing protection, therefore this probability is possible. The sensitivity of the receptor is medium and the magnitude

of change is moderate, as hearing loss could affect the livelihood of the construction worker impacted on during daily life and for future job seeking. The significance of the impact is determined as minor.

Mitigation measures discussed above is incorporated into the existing EMP and no amendments are therefore required.

Table 9 provides an overview of the impact assessment outcomes of noise impacts.

**Table 9 – Impact assessment for the railway construction on noise impacts.**

| ACTIVITY             | RECEPTOR/S           | IMPACT   | NATURE OF IMPACT              | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|----------------------|--|-------------------------------|---------------------|---------------------|------------------------|
| Railway construction | Community            | Noise pollution during construction activities to the community and residents of Walvis Bay.   | Adverse<br>Local<br>Temporary | Low                 | Low/Minor           | Adverse Low<br>(2)     |
| Railway construction | Construction workers | Noise pollution during construction activities to the construction workforce working with machinery and not wearing appropriate PPE. | Adverse<br>Local<br>Permanent | Medium              | Moderate            | Adverse Minor<br>(4)   |

### 3.5.5 HUMAN ENVIRONMENT

#### *3.5.5.1 Traffic and transport congestion*

There will be an increase in traffic and construction vehicles/activity due to railway construction. Increase in congestion in Walvis Bay close to construction sites are expected to occur, especially in areas which are major routes for low-bed trucks in the industrial area. Flagman will be required during road construction works and signage to inform the public of ongoing activities, especially during closure of crossings and if traffic detours are required. Information on construction activities is required to be advertised in the local newspapers after agreements are made with the Walvis Bay Municipality.

Railway construction activities could have an adverse impact on traffic and related congestion, the extent will be restricted to the local area and surrounding environment, for the duration of construction activities (7/8 months) and therefore the duration is temporary. The probability of the impact occurring is possible as during the current level crossings work only temporary or partial road closure was conducted. The sensitivity of the receptor is low and the magnitude of change low/minor, as these impacts will not affect the community for a long period of time and day to day activities and functioning can still continue as is. The significance of the impact is determined as low.

Mitigation measures discussed above is incorporated into the existing EMP and no amendments are therefore required.

#### *3.5.5.2 Traffic and transport vehicle accidents*

There will be an increase in traffic and construction vehicles/activity due to railway construction. Increase in vehicle related accidents/incidents in Walvis Bay close to the construction site activities is a possibility. Flagman will be required during road construction works and signage to inform the public of ongoing activities.

Railway construction activities could have an adverse impact on traffic related accidents with the public in Walvis Bay, the extent will be restricted to the local area and surrounding environment and the duration is expected to be short term, as accidents could result in severe injuries that could influence the community member or construction worker/driver for a longer term (e.g 1 – 5 years). The probability of the impact occurring is possible as vehicle accidents cannot be ruled out and have occurred on the current upgrade works taking place. The sensitivity of the receptor is low as most accidents expected to occur will be minor and not influence the community member or construction worker/driver in the long term. The magnitude of change is however assessed as high/major, as in the case of severe injuries, this could influence the livelihood of the individual in the long term. The significance of the impact is determined as low.

Mitigation measures discussed above is incorporated into the existing EMP and no amendments are therefore required.

### 3.5.5.3 *Infrastructural services*

Railway construction activities could result in damages to neighbouring/adjacent businesses or regional suppliers' infrastructure services as the servitude of the railway in certain sections is closely located to certain business or other services servitudes (e.g. sewage).

Railway construction activities could have an adverse impact on business or infrastructure in Walvis Bay, the extent will be restricted to the local area and surrounding environment and the duration is expected to be temporary for the period of construction activities (5/6 months). The probability of the impact occurring is possible due the narrow working servitude in various sections. The sensitivity of the receptor is low as most accidents expected to occur will be minor and can be resolved with a very short time frame. The magnitude of change is assessed as moderate, as there could be an immediate loss or partial loss of a resource that will be corrected as soon as possible after the incident has taken place (e.g. power loss). The significance of the impact is determined as low.

Mitigation measures for working in built up areas is incorporated into the existing EMP and no amendments are therefore required.

Table 10 provides an overview of the impact assessment outcomes of human environment impacts.

**Table 10 – Impact assessment for the railway construction on human environment impacts.**

| ACTIVITY             | RECEPTOR/S                  | IMPACT   | NATURE OF IMPACT               | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|-----------------------------|--|--------------------------------|---------------------|---------------------|------------------------|
| Railway construction | Community                   | Increase in traffic and construction vehicles/activity due to railway construction. Increase in congestion in Walvis Bay close to construction site. | Adverse<br>Local<br>Temporary  | Low                 | Low/Minor           | Adverse Low<br>(1)     |
| Railway construction | Community health and safety | Increase in traffic and construction vehicles/activity due to railway  | Adverse<br>Local<br>Short term | Low                 | High/Major          | Adverse Low<br>(2)     |

| ACTIVITY             | RECEPTOR/S                 | IMPACT   | NATURE OF IMPACT              | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|----------------------------|--|-------------------------------|---------------------|---------------------|------------------------|
|                      | Construction worker/driver | construction. Increase in possibility of accidents/incidents.                  |                               |                     |                     |                        |
| Railway construction | Built environment          | Damage to neighbouring infrastructure services during construction activities. | Adverse<br>Local<br>Temporary | Low                 | Moderate            | Adverse Low<br>(2)     |

### 3.5.6 AIR QUALITY

#### 3.5.6.1 Air quality and dust impacts on the Walvis Bay residents and community

Dust and related air quality pollution (e.g. fumes) is expected to be generated during construction activities. This could have an impact on the community and residents of Walvis Bay working and residing close to the construction site. Operational activities will not change from the current environment and therefore does not need to be assessed further in this report. Dust is expected from hauling and tipping activities. Fumes are expected from general construction related activities of plant and heavy machinery.

Railway construction activities could have an adverse air quality impact on the Walvis Bay community, which will be restricted to the Project site and immediate surrounding environment and will be for a temporary duration (5/6 months) in line with construction timeline. The probability is expected to be highly probable, as dust and fumes are expected to be generated. The sensitivity of the receptor is determined as low, as residents are not allowed in the direct construction site without approval, proper PPE and induction. The magnitude of change is low/minor as there could be minor irritations but only for a short term. The significance of the impact is determined as low.

The current mitigation measures such as dust suppression, maintenance and daily checks on construction vehicles and machinery and restrictions to public entering the construction site is incorporated into the existing EMP and no amendments are therefore required on these requirements.



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*3.5.6.2 Air quality and dust impacts on the construction workforce*

Dust and related air quality pollution (e.g. fumes) is expected to be generated during construction activities. This could have an impact on the construction workers, especially if staff are not wearing the required PPE. Dust is expected from hauling and tipping activities. Fumes are expected from general construction related activities of plant and heavy machinery.

Railway construction activities could have an adverse air quality impact on construction workers, which could have a local extent in the livelihoods of the employees once construction ceases and duration could be permanent if occupational lung illness results from dust ingress. The probability is expected to be medium, as employees undergo induction and are provided with the required PPE. The sensitivity of the receptor is determined as medium and the magnitude of change moderate, as employees who develop lung issues as a result of dust ingress could have issues in their daily activities that could influence future jobs seeking opportunities as a result of restrictions. The significance of the impact is determined as minor.

The current mitigation measures such as dust suppression, maintenance and daily checks on construction vehicles and machinery and the issuing and use of correct PPE for the workforce is incorporated into the existing EMP and no amendments are therefore required on these requirements.

*3.5.6.3 Air quality and dust impacts on fauna and flora (biodiversity)*

Dust and related air quality pollution (e.g. fumes) is expected to be generated during construction activities and this could have an impact on the fauna and flora of the surrounding construction site. The vegetation and biodiversity are however observed as low, not sensitive, especially as the current construction site is located into a built up area in the industrial area within Walvis Bay. The construction site is also not located in a sensitive biodiversity area.

Railway construction activities could have an adverse air quality impact on fauna and flora, which could have a local extent to the direct and surrounding Project site and the duration is temporary (5/6 months). The probability is expected to be highly probable for the biodiversity located in the Project site as dust and fumes are expected to be generate. The sensitivity of the receptor is determined as low and the magnitude of change none/negligible due to the limited biodiversity found within the railway servitude. The significance of the impact is determined as low.

The current mitigation measures incorporated into the existing EMP remains valid and no amendments are therefore required on these requirements.

Table 11 provides an overview of the impact assessment outcomes of air quality impacts.

**Table 11 – Impact assessment for the railway construction on air quality impacts.**

| ACTIVITY             | RECEPTOR/S                  | IMPACT  | NATURE OF IMPACT              | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|-----------------------------|---|-------------------------------|---------------------|---------------------|------------------------|
| Railway construction | Community health and safety | Air quality - dust and related pollution generated during construction activities to the community and residents of Walvis Bay. | Adverse<br>Local<br>Temporary | Low                 | Low/Minor           | Adverse Low<br>(2)     |
| Railway construction | Fauna and flora             | Air quality (including dust) - on the surrounding environment   | Adverse<br>Local<br>Temporary | Low                 | None/negligible     | Adverse Low<br>(1)     |
| Railway construction | Construction workers        | Dust and related pollution during construction activities to the workforce. Not wearing correct PPE.                            | Adverse<br>Local<br>Permanent | Medium              | Moderate            | Adverse Minor<br>(4)   |

3.5.7 CULTURAL HERITAGE RESOURCES

*3.5.7.1 Disturbance or damages to the Old Walvis Bay cemetery (Muldrene)*

Damages or disturbance to the Old Walvis Bay cemetery could occur as a result of the construction activities. The site is currently classified as a heritage site (graves older than 50 years) and therefore of importance to the National Heritage Council, the Walvis Bay Municipality and local

community members. The future of the site is not yet confirmed if it will remain due to its location in the industrial area. The railway servitude and planned construction work does not fall directly into the perimeter of the cemetery however the construction site is adjacent to the cemetery. The access is very open due to the wall being in a poor condition.

Railway construction activities could have an adverse impact on the cemetery, this impact could have regional and long-term implications, due to the importance of heritage sites and their protection being covered under the National Heritage Act, No. 27 of 2004. The probability of the impact occurring is possible, especially if mitigation measures are not adhered to. The sensitivity of the receptors is medium, as damages to the sites can be restored/reversible in some cases and in others not. The magnitude of change is high/major due to the sensitivity of the site (graves). The significance of the impact is determined as minor.

Mitigation measures such as awareness will need to be raised with the staff on a continual basis in this regard to keep them away from the site. If required additional demarcation signage will be erected to keep staff away from the site. These measures have been incorporated into the EMP.

Table 12 provides an overview of the impact assessment outcomes of heritage impacts.

**Table 12 - Impact assessment for the railway construction on heritage impacts.**

| ACTIVITY             | RECEPTOR/S                                      | IMPACT  | NATURE OF IMPACT           | VALUE & SENSITIVITY | MAGNITUDE OF CHANGE | SIGNIFICANCE OF IMPACT |
|----------------------|---|---|----------------------------|---------------------|---------------------|------------------------|
| Railway construction | Community Heritage site Walvis Bay Municipality | Damages or disturbance to the Old Walvis Bay cemetery can be incurred as a result of the construction activities. | Adverse Regional Long term | Medium              | High/Major          | Adverse Minor (4)      |

### 3.5.8 CUMULATIVE IMPACTS

Cumulative impacts will only occur if other construction works start up in Walvis Bay for services within the railway servitude of TransNamib, which will namely be for sewage or road works. The cumulative impacts assessed will be for noise, dust (air quality) and human environment (traffic and transport). These impacts will remain the same as assessed and scored in the sections above. Therefore, the significance of the cumulative impacts is determined as low to minor.

### 3.6 ENVIRONMENTAL MANAGEMENT PLAN

The EMP for the amended portions of the proposed railway upgrade Project is presented in Appendix A. It should be included as an appendix to the original EMP (Appendix – C: Hartz, C., 2017). It provides management options to ensure the impacts of the proposed amendments to the Project are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary.

The management measures should be adhered to during the various phases of the railway upgrade and construction process. All personnel taking part in the operations of the proposed Project should be made aware of the contents of the EMP, so as to plan the operations accordingly and in an environmentally sound manner.

The objectives of the EMP are:

- To include all components of the development and operations of the Project;
- To prescribe the best practicable control methods to lessen the environmental impacts associated with the Project;
- To monitor and audit the performance of operational personnel in applying such controls; and
- To ensure that appropriate environmental training is provided to responsible operational personnel.

## **4 CONCLUSIONS AND RECOMMENDATIONS**

After evaluating and assessing the listed aspects and potential impacts in section 3.5, it was determined that all adverse impacts sensitivity is of a low to minor significance. A beneficial major socioeconomic impact was noted for local business with the upgrades to the fuel line that will improve the efficiency of the product being transported from the harbour (NamPort) to the bulk infrastructure suppliers/users and inland, and this will have a positive impact nationally.

It was assessed that the potential impact to the historical cemetery to the west of the site in the vicinity of the bulk fuel suppliers is minor. The servitude of the construction activities will not impede on this cemetery and mitigation measures in the EMP are specified and will be implemented. The Walvis Bay Municipality has been engaged and are informed of the planned upgrade works in relation to this heritage site.

Through analysis and identification of mitigation and management methods, the assessment concludes that the likelihood of significant environmental impact due to these amendments is low. Various best practice and mitigation measures have been identified to avoid and reduce effects as far as reasonably practicable, as well to as ensure the environment is protected and unforeseen effects are avoided.

On this basis, it is of the opinion of ECC that a revised environmental clearance certificate could be issued, on condition that the management and mitigation measures specified in the original environmental management plan (Appendix A) are implemented and adhered to.

## **5 REFERENCES**

- Hartz, C., 2017. ENVIRONMENTAL SCOPING REPORT. Upgrade of Railway Line between Walvis Bay Station and Kranzberg Station.
- Hartz, C., 2017. ENVIRONMENTAL MANAGEMENT PLAN. Upgrade of Railway Line between Walvis Bay Station and Kranzberg Station.
- Bezuidenhout, S., 2018. ECC-34-155-REP-04-A-Amendment Report. Environmental Compliance Consultancy.
- Bezuidenhout, S., 2018. ECC-34-155-REP-05-A-Environmental Management Plan. Environmental Compliance Consultancy.

## **6 APPENDICES**

### **APPENDIX A – ENVIRONMENTAL MANAGEMENT PLAN**

## **APPENDIX B – PUBLIC CONSULTATION REPORT**



## **APPENDIX C – ENVIRONMENTAL ASSESSMENT PRACTITIONERS CVS**

## **APPENDIX D – ORIGINAL SCOPING REPORT (2017)**

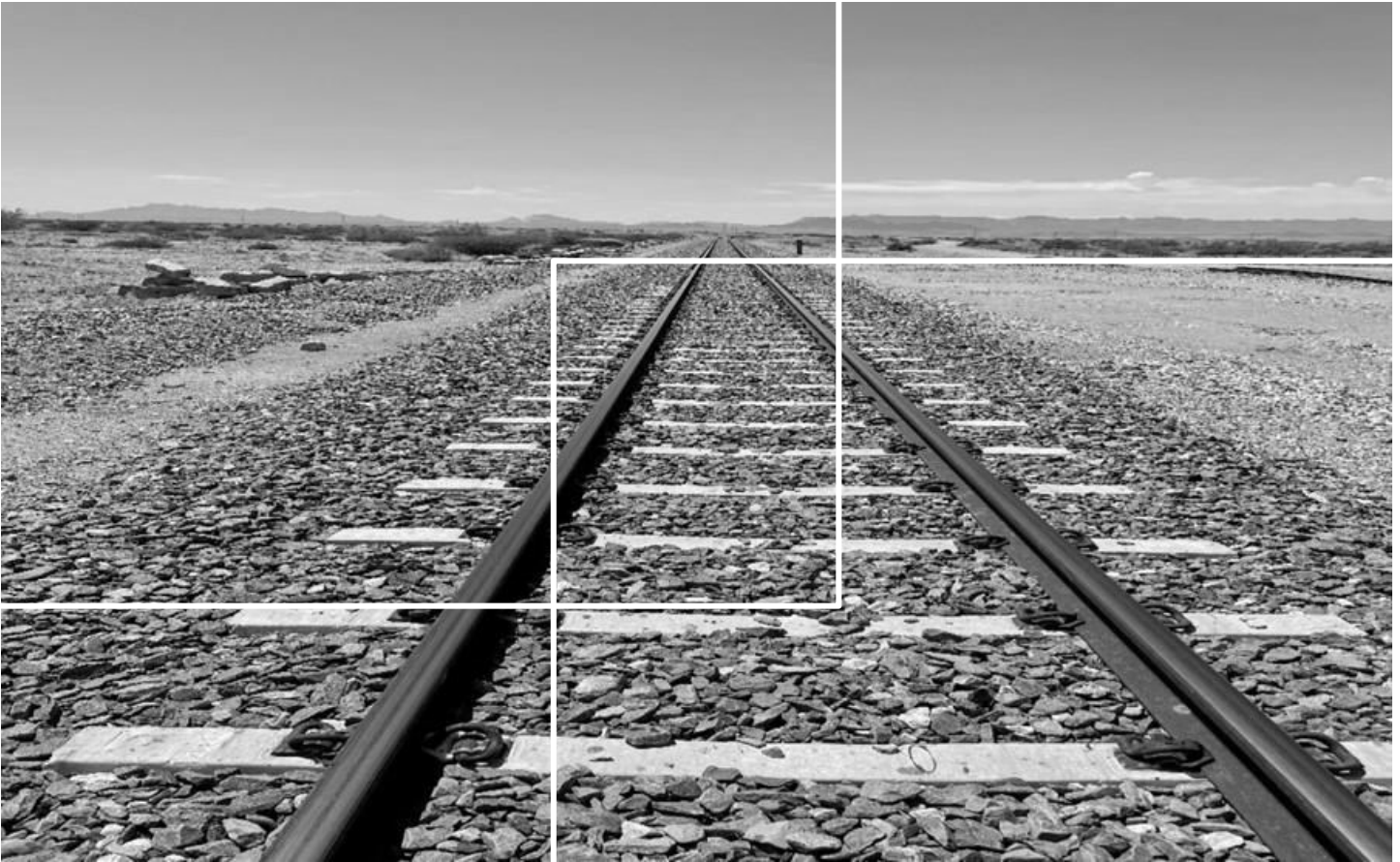


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**APPENDIX E - ENVIRONMENTAL CLEARANCE CERTIFICATE  
AMENDMENT REPORT (2018)**

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## **APPENDIX F – ENVIRONMENTAL CLEARANCE CERTIFICATES ISSUED FOR THE PROJECT**



Submitted to: Bigen Infrastructure Services Namibia (Pty) Ltd  
on behalf of the Ministry of Works and Transport  
Attention: Mrs Hanli Bothma  
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# REPORT:

## ENVIRONMENTAL MANAGEMENT PLAN FOR THE UPGRADE OF WALVIS BAY FUEL LINE

PROJECT NUMBER: ECC-34-434-REP-03-D  
REPORT VERSION: REV 01  
DATE: 06 DECEMBER 2022

Prepared by:



### TITLE AND APPROVAL PAGE

Project Name: Environmental management plan for the upgrade of Walvis Bay fuel line

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Report Version: Rev 01

Status of Report: Draft for Government submission

Project Number: ECC-34-434-REP-03-D

Date of issue: 06 December 2022

Review Period: NA

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## **Environmental management plan for the upgrade of Walvis Bay fuel line**

Bigen Infrastructure Services Namibia (Pty) Ltd on  
behalf of the Ministry of Works and Transport

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## TERMS AND ABBREVIATIONS

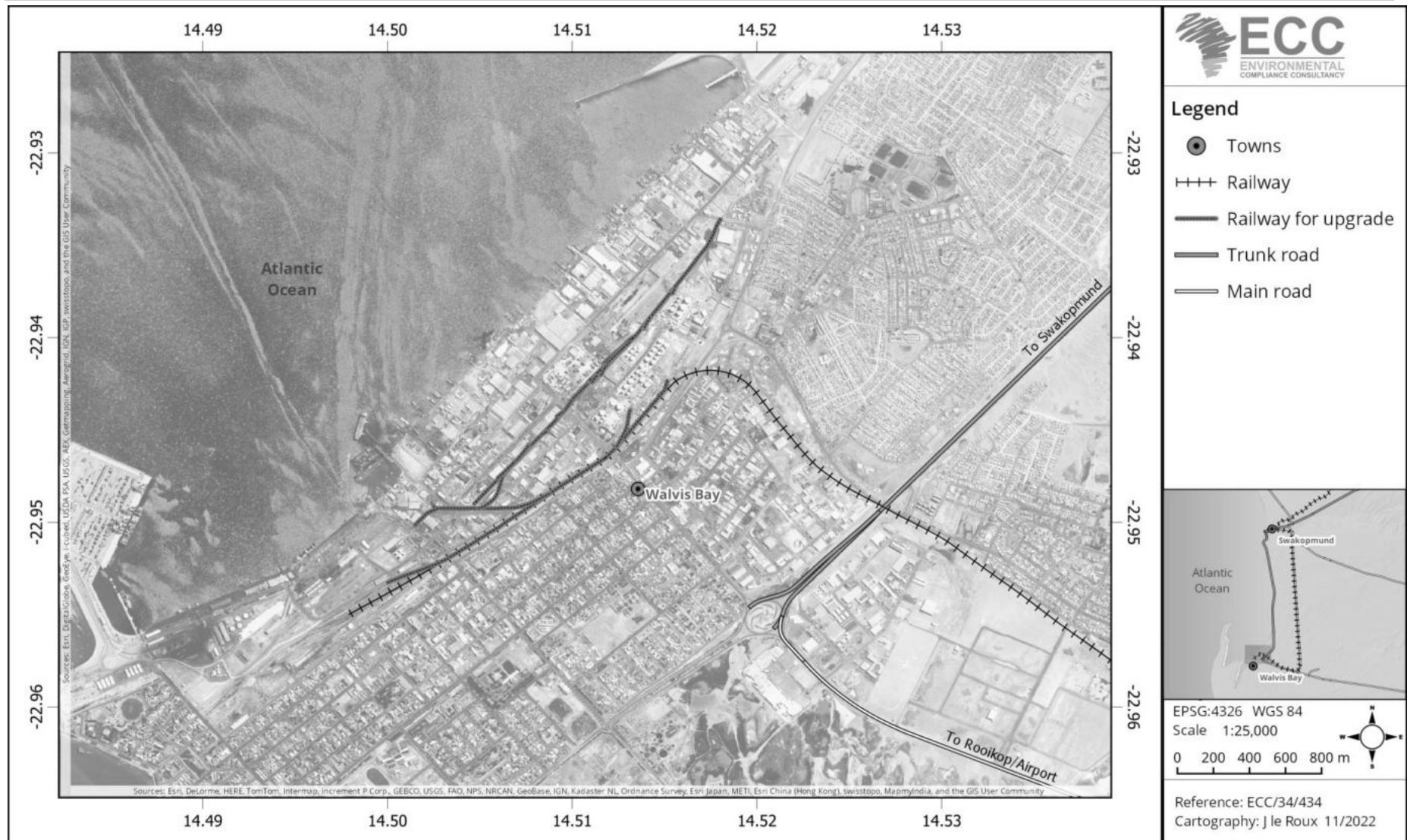
| ABBREVIATIONS    | DESCRIPTION  |
|------------------|--|
| %                | percentage   |
| AIDs             | acquired immune deficiency syndrome                    |
| BISN             | Bigen Infrastructure Services Namibia (Pty) Ltd        |
| CLO              | community liaison officer                              |
| DEO              | designated environmental officer                       |
| DWA              | Department of Water Affairs                            |
| EAP              | environmental assessment practitioner                  |
| ECC <sub>1</sub> | environmental clearance certificate                    |
| ECC <sub>2</sub> | Environmental Compliance Consultancy                   |
| EMA              | Environmental Management Act, No.7 of 2007             |
| EMP              | environmental management plan                          |
| EMS              | environmental management system                        |
| ESIA             | environmental and social impact assessment             |
| ER               | engineering representative                             |
| HIV              | human immunodeficiency virus                           |
| I&APs            | interested and affected parties                        |
| IECO             | independent environmental control officer              |
| kg/m             | kilogram per metre                                     |
| km               | kilometre  |
| OHSE             | occupational, health, safety and environment           |
| m <sup>3</sup>   | metre cubed  |
| m                | metre  |
| mm               | millimetre   |
| MAWRL            | Ministry of Agriculture, Water Affairs and Land Reform |
| MEFT             | Ministry of Environment, Forestry and Tourism          |
| MME              | Ministry of Mines and Energy                           |
| MoWT             | Ministry of Works and Transport                        |
| MSDS             | material safety datasheet                              |
| NamPort          | Namibian Port Authorities                              |
| PPE              | personal protective equipment                          |
| PM               | Project manager  |
| SADC             | South African Development Community                    |
| STD(s)           | sexually transmitted disease(s)                        |
| WHO              | World Health Organization                              |

# 1 INTRODUCTION

## 1.1 PROJECT BACKGROUND

An environmental clearance certificate (ECC<sub>1</sub>) for the upgrade of the existing railway line between Walvis Bay and Kranzberg stations (210 km) was granted in October 2017 by the Ministry of Environment, Forestry and Tourism (MEFT). The need for this upgrade was to improve the safety of the railway line, travel times, improve axle loads and meet the minimum requirements of the South African Development Community (SADC) railway standards. In 2018 it was determined that an amendment was required to the ECC<sub>1</sub> as a result of design development of the railway line, namely focusing on bridges. The amendment application was successful and the environmental clearance was granted in November 2018. The ECC<sub>1</sub> for the Project was renewed on the 30 November 2020 and is valid until 30 November 2023. Further to this, it has been determined that an amendment is required for the current environmental clearance to include the upgrade of the fuel railway line in Walvis Bay. The proposed Project includes the upgrade of 6 210 m length of track of the current fuel line from the port of Walvis Bay (NamPort) to the bulk fuel supplier's infrastructure, and inland (see Figure 1).

This report describes only the potential environmental impact of the additional work and EMP conditions related and applicable to these departures from the construction related to the original railway upgrade. Wherever possible this report has remained consistent with the original EMP to avoid ambiguity with regard to the environmental matters.



**Figure 1 - Locality map and servitude of the railway line in Walvis Bay.**

## 1.2 ENVIRONMENTAL REGULATORY REQUIREMENTS

The proposed Project is considered as a listed activity as set out in the Environmental Management Act, 2007 (Act No. 7 of 2007) and the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011) gazetted under the Environmental Management Act, (EMA), 2007 (Act No. 7 of 2007) (referred to herein as the EIA Regulations). An Environmental scoping report and environmental management plan (EMP) are required as part of the environmental clearance certificate application, as well as to support the decision-making process.

This report presents the EMP (see Section 1.3) and has been undertaken in accordance with the requirements of the Environmental Management Act, 2007 and associated Regulations.

## 1.3 PURPOSE AND SCOPE OF THIS REPORT

This report is a revised EMP due to amendments to the original Project scope of work and the amendments from 2018.

The amendments from 2018 includes the following:

- A new bridge over the Khan River alongside the old bridge
- Additional structures to the three existing bridges to ensure structural integrity is improved to safely accommodate the future 18.5 tonne axle load.
- In addition, the method to prevent and control wind-blown sand on the rail has been further refined.

The amendments from 2022 includes the following:

- Upgrade of the additional fuel railway line in Walvis Bay ( $\pm$  5 km) from the port of Walvis Bay to the bulk infrastructure suppliers.

The purpose of this EMP, for these amended portions of the Project, is to provide a management framework for the planning and implementation of construction, operation and decommissioning activities, and provide construction standards and operating arrangements so that potential environmental and social impacts of the Project are mitigated, prevented and minimised as far as reasonably practicable, and that statutory requirements and other legal obligations are fulfilled. This EMP also presents protocols and procedures, and roles and responsibilities to ensure the management arrangements are appropriately and effectively implemented.

This EMP forms an appendix to the environmental scoping report, original EMP (Hartz, C., 2017) and was updated based on the 2018 amended EMP for the railroad upgrade Project; therefore, the environmental scoping report should be referred to for further information on the Project, assessment methodology, applicable legislation and assessment findings. The ECC<sub>2</sub> assessment methodology was utilised for the 2022 amendment report and additional mitigation measures from the assessment outcomes are incorporated into this EMP.

This EMP is a live document and shall be reviewed at predetermined intervals, and/or updated when the scope of works alters, or when further data / information can be added. All personal working on the Project will be legally required to comply with the standards set out in the EMPs. The scope of this EMP includes the duration of the Project life: construction, operation and decommissioning.

### 1.4 MANAGEMENT OF THIS EMP

The Proponent holds an environmental clearance certificate for the Project and is responsible for the implementation and management of this EMP.

Prior to the any future amendment construction works commencing, this EMP shall be reviewed, changed where required and approved ready for implementation. The execution and management of this EMP, and thus the monitoring of compliance, shall be undertaken through daily duties and activities and monthly inspections (see Sections 2.2 and 5).

This EMP shall be circulated to all contractors, sub-contractors and shall be made available on the Proponent's website.

### 1.5 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS OF THIS EMP

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

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

The information contained in this EMP has been based on the Project description as provided in the amendment report. Should the design or construction methods alter further from what is currently planned, this EMP may require updating and potential further assessment might be undertaken.

### 1.6 ENVIRONMENTAL COMPLIANCE CONSULTANCY

Environmental Compliance Consultancy (ECC) (Reg. No. CC 2013/11401) has prepared this EMP on behalf of the Proponent.

This report has been authored by ECC employees who have no material interest in the outcome of this report, nor do any of the ECC team have any interest that could reasonably be regarded as being capable of affecting their independence in the preparation of this report. ECC is independent from the proponent and has no vested or financial interest in the project, except for fair remuneration for professional fees rendered based upon agreed commercial rates. Payment of these fees is in no way contingent on the results of this report, the assessment, or a record of decision issued by Government. No member or employee of ECC is, or is intending to be, a director,

officer, or any other direct employee of the Ministry of Works and Transport (MWT). No member or employee of ECC has, or has had, any shareholding in Ministry of Works and Transport (MWT).

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

Environmental Compliance Consultancy

PO Box 91193, Klein Windhoek, Namibia

Tel: +264 81 669 7608

Email: [info@eccenvironmental.com](mailto:info@eccenvironmental.com)



## 2 PROJECT MANAGEMENT AND PERSONNEL

### 2.1 MINISTRY OF WORKS AND TRANSPORT

The Ministry of Works and Transport holds an approved environmental clearance certificate for the railway line and shall be responsible for the implementation and management of this EMP across the development for its entire lifetime. The Proponent shall provide a project team to oversee and undertake the construction works, which shall be composed of the Proponent’s personnel, contractors and consultants. A nominated role shall be identified to ensure maintenance of the development is undertaken through the operations phase, and prior to the project moving into the decommissioning phase, a nominated role shall also be identified to ensure the management of decommissioning and the implementation of this EMP is applied throughout.

### 2.2 ORGANISATIONAL STRUCTURE, ROLES AND RESPONSIBILITIES

The proponent shall be responsible for:

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

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

The key personnel and environmental responsibilities of each role through the project life are presented in Table 1. The contact details of key personnel shall be recorded and pasted up clearly at each construction site as well as being distributed to key project personnel, contractors and sub-contractors.

**Table 1 - Key roles and responsibilities**

| Role        | Responsibility & duties   |
|-------------|---|
| <b>MoWT</b> | The Proponent, MoWT, will review reports regarding the implementation of the EMP, and make payments to the engineer, contractor and IECO based on satisfactory performance, including satisfactory implementation of the EMP. MoWT can also give formal warnings and impose fines and penalties on the contractor when the contractor neglects to implement the EMP satisfactorily. |

| Role  | Responsibility & duties   |
|---|---|
| <p><b>Engineer’s representative (ER) – Bigen Infrastructure Services Namibia (BISN)</b></p> | <p>The person who represents MoWT on site and is responsible for construction supervision contract administration and communicate formally with the contractor on behalf of MoWT on all matters:</p> <ul style="list-style-type: none"> <li>- Responsible for ensuring compliance with this EMP including overseeing the construction works, day to day activities during operations, and routine and non-routine maintenance during operations, as well as the decommissioning of the development;</li> <li>- Ensuring all personnel are aware of the commitments made in this EMP and any other relevant regulatory requirements applicable to the project;</li> <li>- Ensuring adequate resources are made available for implementation of this EMP;</li> <li>- Daily monitoring of the Project regarding compliance with the EMP;</li> <li>- Maintain the Community Issues and Concern Register, and keep records of complaints, non-compliance, fines, and penalties and assist in damage assessments where incidents and accidents or serious infringements have occurred both verbally and in writing. Issue instructions for the remedying of these situations accordingly;</li> <li>- Ensuring all employees and contractors participate in a site induction process prior to commencing work on the Project;</li> <li>- Maintain up to date register of employees who have completed the site induction;</li> <li>- Report any non-compliance or accidents to the Regulatory Authority; and</li> <li>- Enforce temporary work stoppages where serious environmental, social, or health &amp; safety infringements and non-compliances have occurred.</li> </ul> |
| <p><b>Independent environmental control officer (IECO)</b></p>                              | <p>Independent of the contractor and engineer, who has been appointed by the Proponent and who is familiar with all aspects of the EMP and is responsible for monitoring the contractor’s compliance with the EMP.</p> <ul style="list-style-type: none"> <li>- MoWT through the ER will appoint an IECO who will visit and inspect the construction site on a monthly basis. The IECO will perform environmental audits of the contractor’s operations and participate in the monthly site meetings with the MoWT, ER and contractor, providing his/her input on EMP-related issues;</li> <li>- Review the credentials of the contractor’s proposed DEO and make a recommendation to MoWT and the ER regarding whether the proposed DEO should be approved;</li> <li>- Be the principal contact point in relation to environmental performance of the Project;</li> </ul>  |

| Role                           | Responsibility & duties  |
|--------------------------------|--|
|                                | <ul style="list-style-type: none"> <li>- Reporting environmental performance to the Project Manager (construction);</li> <li>- Reviewing environmental management content of method statements;</li> <li>- Providing guidance to personnel in dealing with environmental matters, including legal and statutory requirements affecting the works;</li> <li>- Being responsible for all environmental management plans, environmental monitoring and EMP compliance assessments, and production of associated audit reports/records which will be provided to MEFT, ER and MoWT;</li> <li>- Being responsible for providing a response to environment-related complaints received from the public or other stakeholders and will make recommendations to the ER and MoWT regarding corrective actions to be taken by the contractor, penalties and fines, etc. which will be issued to the contractor by the ER;</li> <li>- Undertake damage assessments where incidents, accidents and serious infringements have occurred.;</li> <li>- Ensuring that best environmental practice is undertaken throughout the duration of the Project;</li> <li>- Undertaking checks of the construction site and construction activities;</li> <li>- Undertaking checks of maintenance works during operations;</li> <li>- Provisioning of environmental awareness/management training and inductions;</li> <li>- Responsible for the management, maintenance and revisions of this EMP subsequent environmental plans (e.g. Waste Management Plan);</li> <li>- Timely distribution of any relevant environmental documentation, including revisions to this EMP, to all construction managers and contractors; and</li> <li>- Inspect and approve any areas that have been rehabilitated by the contractor.</li> </ul> <p><b>Note: If this role is not filled due to the low impact associated with this project the Project Manager must take on the responsibilities and sign off on this position.</b></p> |
| <b>Appointed contractor</b>    | The contractor appointed to do the railway upgrade works. The company and its appointed representatives and/or sub-contractors have the overall responsibility to ensure that the EMP is complied with, and that various best practice and mitigation measures are applied to avoid and reduce effects as far as reasonably practicable, as well as ensure the environment is protected and unforeseen effects are avoided.  |
| <b>Contractor's designated</b> | Appointed by the contractor and approved by the ER and MoWT to manage the performance of the construction and operational maintenance  |

| Role                                      | Responsibility & duties  |
|---|--|
| <p><b>environmental officer (DEO)</b></p> | <p>activities. The DEO must be on site at all times. Responsible for the EMP implementation and ensuring all activities are compliant with this EMP on behalf of the contractor, as well as:</p> <ul style="list-style-type: none"> <li>- Managing the preparation and implementation of method statements for certain activities, and ensuring the ER and IECO reviews all method statements and the relevant environmental protocols are incorporated;</li> <li>- Implement and ensure compliance of the EMP as well as any conditions stipulated in the ECC<sub>1</sub> issued by MEFT or any other competent regulatory body having authority over the project for the duration of the construction/ upgrading and reporting any non-compliance or accidents to the ER and IECO;</li> <li>- Ensuring that all staff have attend a site induction session before commencement of any work on site and that they are adequately informed of the requirements of this EMP and health and safety issues;</li> <li>- Daily inspections of the contractor's camps to ensure EMP stipulations are being complied with;</li> <li>- Ensuring that all contract workers, sub-contractors and visitors to the site are conversant with the requirements of this EMP, relevant to their roles on site and adhere to this EMP at all times;</li> <li>- Receiving, responding to and recording complaints and serve as the contractor's communicator on all EMP-related issues;</li> <li>- Notify the ER and IECO immediately in the event of any accident or infringements of the EMP and ensure appropriate remedial action is taken;</li> <li>- Notify the ER and IECO at least 10 working days in advance of any activity that may have significant environmental impacts, so that planned mitigation measures may be reviewed and approved well in advance</li> <li>- Ensure compliance by all of the contractor's and sub-contractors' staff with designated "No-Go" areas;</li> <li>- Inform the ER and IECO of any plans to rehabilitate areas affected by construction activities, so that the planned measures may be reviewed and approved well in advance; and</li> <li>- Submit monthly reports to the ER and IECO, regarding any environmental management and health and safety measures implemented, as well as any training or awareness-raising sessions performed; the status of training received by all staff including Sub-contractors' staff; and descriptions of any issues or incidents concerning environmental management or health and safety, and what the contractor has done to address the issues and incidents.</li> </ul> |

| Role  | Responsibility & duties   |
|---|---|
| <b>Construction workers / maintenance workers</b> | Responsible for being compliant with this EMP throughout the construction works, in addition to: <ul style="list-style-type: none"> <li>- Ensuring they have undertaken a site induction and are conversant with the requirements of this EMP;</li> <li>- Ensuring appropriate briefings for certain activities have been provided and fully understood;</li> <li>- Adherence to this EMP at all times; and</li> <li>- Reporting of any operations and conditions that deviate from the EMP or any non-compliant issues or accidents to the ER and IECO, and Site/Project Manager.</li> </ul> |

### 2.3 CONTRACTORS

Any contractors hired during the construction works or maintenance activities during the operational phase shall be compliant with this EMP, and shall be responsible for the following:

- Undertaking activities in accordance with this EMP as well as relevant policies, procedures, management plans, statutory requirements, and contract requirements;
- Implementing appropriate environmental and safety management measures;
- Reporting of environmental issues, including actual or potential environmental incidents and hazards, to the ER, IECO and Site / Project Manager; and
- Ensuring appropriate corrective or remedial action is taken to address all environmental hazards and incidents reported by employees and subcontractors.

### 2.4 EMPLOYMENT

The proponent and all contractors shall comply with the requirements of the Republic of Namibia Regulations for Labour, Health and Safety and any amendments to these regulations. The following shall be complied with:

- In liaison with local government and community authorities the proponent and contractors shall ensure that local people have access to information about job opportunities and are considered first for construction/maintenance contract employment positions;
- The number of job opportunities shall be made known together with the associated skills and qualifications. The maximum length of time the job is likely to last shall be clearly indicated;
- Foreign workers with no proof of permanent legal residence shall not be hired;
- Every effort shall be made to recruit from the pool of unemployed workers living in the local area; and
- Principals shall be developed that ensure a robust employment policy is implemented across the proposed Project.

### 2.5 HIRING OF LOCAL LABOUR

The contractor will be instructed to hire local labourers in the construction tender documents and contract. The contractor will be required to appoint an experienced Community liaison officer (CLO) who will be responsible for contacting community leaders who will assist the CLO to identify and select local labourers. A labour employment plan will be developed which will inform the CLO, community leaders and contractor about the guidelines to be followed in the selection process. Selected local labourers will be remunerated in compliance with gazetted industry minimum rates.

### 2.6 REGISTER OF ENVIRONMENTAL ASPECTS AND IMPACTS

An environmental review of the proposed Project has been completed to identify all the commitments and agreements made. A list of environmental commitments and impacts has been produced, which details deliverables including measures identified for the prevention of pollution or damage to the environment during the construction phase.

Table 2 provides a list of environmental aspects and impacts, as well as associated mitigation (as derived from the previous ESIA's) and monitoring measures, and the roles responsible for compliance. Each monitoring plan and programme are further explained in detail further in this document. They will be subject to regular review by the Environmental manager and updated when necessary.

The Independent environmental control officer (IECO) will use this register to undertake regular inspections (see next section) to ensure the Project is compliant with this EMP.

**Table 2 - A list of environmental aspects and impacts, as well as associated mitigation and monitoring requirements**

| <b>Receptors</b>   | <b>Potential impacts</b>  | <b>Management/mitigation measures</b>   | <b>Monitoring requirements</b>  | <b>Responsibility</b>  |
|--|---|---|---|--|
| Development of access roads                                | <ul style="list-style-type: none"> <li>- Removal of vegetation</li> <li>- Injury or mortality of reptiles and amphibians</li> <li>- Land use and degradation</li> </ul> | <ul style="list-style-type: none"> <li>- Use existing tracks;</li> <li>- Route new tracks around established and protected trees, and clumps of vegetation;</li> <li>- Identify important tree species (protected species) and mark with demarcation tape to clearly highlight to construction workers (Annex B);</li> <li>- Remove invasive species ;</li> <li>- Visually check the area prior to undertaking construction works for any environmentally sensitive fauna and flora;</li> <li>- Relocate slow moving reptiles and amphibians away from the construction area;</li> <li>- No driving off designated access routes (into the bush) / off-road driving;</li> <li>- Speed restrictions applied;</li> <li>- Avoid natural drainage lines; and</li> <li>- Install any erosion control measures to avoid surface run off during the wet season.</li> </ul> | <ul style="list-style-type: none"> <li>- Daily visual observations during activity.</li> </ul>  | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |
| Establishment and management of construction working areas | <ul style="list-style-type: none"> <li>- Noise and dust</li> <li>- Residential visual amenity</li> <li>- Community severance</li> </ul>                                 | <ul style="list-style-type: none"> <li>- Bring in plant and equipment only as and when required;</li> <li>- Suitable siting of construction office, waste collection area, and storage area for plant and equipment;</li> <li>- Downward lighting;</li> </ul>   | <ul style="list-style-type: none"> <li>- Daily visual observations.</li> <li>- Contractor’s Project manager to oversee the set-up of the construction working areas.</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |

**Environmental management plan for the upgrade of Walvis Bay fuel line**

Bigen Infrastructure Services Namibia (Pty) Ltd on behalf of the Ministry of Works and Transport

| Receptors   | Potential impacts  | Management/mitigation measures   | Monitoring requirements   | Responsibility   |
|---|--|--|---|--|
|   | <ul style="list-style-type: none"> <li>- Impacts on flora and fauna</li> </ul>   | <ul style="list-style-type: none"> <li>- Application of good housekeeping;</li> <li>- No snares or catching of animals for pets or food; and</li> <li>- Enforcement of quality control plans.</li> </ul>   |   |  |
| Removal of vegetation in servitudes and camp site areas | <ul style="list-style-type: none"> <li>- Loss of established vegetation and protected species</li> <li>- Injury or mortality of reptiles and amphibians</li> </ul> | <ul style="list-style-type: none"> <li>- Identify important tree species (protected species) and mark with demarcation tape to clearly highlight to construction workers, prior to construction work;</li> <li>- Any trees felled, to be used in accordance with the permit;</li> <li>- No animals or birds may be collected, caught, consumed or removed from site by the contractor or personnel on site;</li> <li>- Catch and release slow moving reptiles and amphibians, move at least 50 m from the site;</li> <li>- Clear only enough vegetation to meet the purpose intended;</li> <li>- Remove any invasive or alien species along the route;</li> <li>- Identify and mark some large individuals of <i>Acacia erioloba</i> and <i>Combretum imberbe</i> trees (Annex B) where they are present and make sure they are protected;</li> <li>- Check working area prior to construction works commencing, daily;</li> </ul> | <ul style="list-style-type: none"> <li>- Daily observations.</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |



### Environmental management plan for the upgrade of Walvis Bay fuel line

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| Receptors                                      | Potential impacts   | Management/mitigation measures   | Monitoring requirements   | Responsibility  |
|--|---|--|---|---|
|  |   | <ul style="list-style-type: none"> <li>- Avoid disturbing geological features and rocky areas; and</li> <li>- Enforcement of quality control plans.</li> </ul>   |   |   |
| Ground excavation and trenching or foundations | <ul style="list-style-type: none"> <li>- Loss of established vegetation and protected species</li> <li>- Injury or mortality reptiles and amphibians</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor's designated competent supervisor to oversee all ground excavation works;</li> <li>- Daily inspection of open trench for reptiles. Must be removed to a safe location and not killed or harmed;</li> <li>- Ensure members of team are trained in safe snake handling or appoint a trained snake handler for the Project (this can be a trained worker);</li> <li>- In the event of a heritage discovery, works to cease until advice from specialist is obtained. A permit from the National Heritage Council will be required to relocate remains; and</li> <li>- Minimise stockpiling and specific works during high winds.</li> </ul> | <ul style="list-style-type: none"> <li>- Daily visual observations.</li> <li>- Contractor's Project manager to oversee the set-up of the construction working areas.</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul>                |
| Surface water and drainage                     | <ul style="list-style-type: none"> <li>- Surface water pooling and poor drainage/run-off</li> </ul>   | <ul style="list-style-type: none"> <li>- Ensuring that during construction activities drainage is good and water does not pool through effective pre-planning.</li> </ul>  | <ul style="list-style-type: none"> <li>- Daily visual observations</li> </ul>   | <ul style="list-style-type: none"> <li>Contractor</li> </ul>                  |
| General construction activities:               | <ul style="list-style-type: none"> <li>- Generation of waste, odours and pests</li> </ul>   | <ul style="list-style-type: none"> <li>- Application of waste management plan;</li> <li>- Waste to be collected, separated and stored in appropriately marked areas / containers</li> </ul>  | <ul style="list-style-type: none"> <li>- Operate in accordance with the waste management plan.</li> <li>- Update the waste management plant as and when required.</li> </ul>    | <ul style="list-style-type: none"> <li>- Contractor</li> <li>- DEO</li> </ul> |

### Environmental management plan for the upgrade of Walvis Bay fuel line

Bigen Infrastructure Services Namibia (Pty) Ltd on behalf of the Ministry of Works and Transport

| Receptors  | Potential impacts  | Management/mitigation measures  | Monitoring requirements  | Responsibility  |
|--|--|---|--|---|
| Generation of waste                                |  | <ul style="list-style-type: none"> <li>(e.g., wood, metals, building rubble, garden waste, domestic waste);</li> <li>- Waste storage areas shall be appropriately signposted, well maintained and good housekeeping must be applied;</li> <li>- Waste will be disposed of in designated and appropriate facilities, which will be identified in the waste management plan (most likely the waste dump site close to the route alignment);</li> <li>- Waste will not be burnt on site (burnt on designated disposal site); and</li> <li>- Site induction and training of staff.</li> </ul> | <ul style="list-style-type: none"> <li>- Daily and weekly checks of waste collection area.</li> </ul>                  |   |
| Operating plant and equipment                      | Local Community: <ul style="list-style-type: none"> <li>- Reduced local air quality (vehicle emissions)</li> <li>- Increase in local noise levels</li> </ul> | <ul style="list-style-type: none"> <li>- Avoid idling of plant and equipment (i.e., turn off when not in use);</li> <li>- Minimise the multiple use of noisy plant and equipment;</li> <li>- Vehicles to be in good working order and well maintained and serviced in accordance with specific requirements;</li> <li>- Notice to surrounding community of when noisy activities are to be undertaken; and</li> <li>- Site induction.</li> </ul>  | <ul style="list-style-type: none"> <li>- Daily observations</li> <li>- Weekly checks by the Contractor's PM</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul>                |
| Use and maintenance of plant and equipment: Spills | <ul style="list-style-type: none"> <li>- Loss of containment, causing localised ground</li> </ul>  | <ul style="list-style-type: none"> <li>- Spill kits in designated areas around site.</li> <li>- Contain and clean up spill in accordance with emergency procedures;</li> <li>- Report spills as soon as possible;</li> </ul>  | <ul style="list-style-type: none"> <li>- Daily observations and checks of plant and equipment</li> </ul>               | <ul style="list-style-type: none"> <li>- Contractor</li> <li>- DEO</li> </ul> |

**Environmental management plan for the upgrade of Walvis Bay fuel line**

Bigen Infrastructure Services Namibia (Pty) Ltd on behalf of the Ministry of Works and Transport

| <b>Receptors</b>                              | <b>Potential impacts</b>   | <b>Management/mitigation measures</b>  | <b>Monitoring requirements</b>   | <b>Responsibility</b>  |
|---|--|--|--|--|
| of fuels, oils or chemicals                   | contamination, potential groundwater contamination                   | <ul style="list-style-type: none"> <li>- All plant and material to be well maintained and have appropriate containment (drip trays);</li> <li>- Site induction and appropriate training of nominated persons;</li> <li>- Suitable personal protective equipment (PPE) and equipment when handling hazardous chemicals, liquids and materials; and</li> <li>- Storage of vehicles away from the area where the aquifer / shallow groundwater is located.</li> </ul> |  |  |
| General construction activities: energy use   | <ul style="list-style-type: none"> <li>- Use of resources</li> </ul> | <ul style="list-style-type: none"> <li>- Turn off plant and equipment when not in use;</li> <li>- Regular maintenance of plant and equipment;</li> <li>- Minimise / optimise workforce travel;</li> <li>- Source sustainable material where possible; and</li> <li>- Apply waste hierarchy and reuse and recycle</li> </ul>  | <ul style="list-style-type: none"> <li>- Daily observations</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |
| General construction activities: material use | <ul style="list-style-type: none"> <li>- Use of resources</li> </ul> | <ul style="list-style-type: none"> <li>- Source materials locally to reduce transportation;</li> <li>- Source sustainable material where possible; and</li> <li>- Apply waste hierarchy, reuse and recycle. material where possible.</li> </ul>  | <ul style="list-style-type: none"> <li>- Daily observations</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |

### Environmental management plan for the upgrade of Walvis Bay fuel line

Bigen Infrastructure Services Namibia (Pty) Ltd on behalf of the Ministry of Works and Transport

| Receptors                              | Potential impacts   | Management/mitigation measures   | Monitoring requirements  | Responsibility   |
|--|---|--|--|--|
| General construction activities: noise | <ul style="list-style-type: none"> <li>- Noise pollution to Walvis Bay residents and community</li> </ul> | <ul style="list-style-type: none"> <li>- Activities are only planned for the day when residents are at work; and</li> <li>- Residents may not enter the construction site without approval and the required inductions.</li> </ul>   | <ul style="list-style-type: none"> <li>- Daily observations</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |
| General construction activities: noise | <ul style="list-style-type: none"> <li>- Noise impacts to construction workers</li> </ul>                 | <ul style="list-style-type: none"> <li>- Wearing the appropriate personal protective equipment (PPE).</li> </ul>   | <ul style="list-style-type: none"> <li>- Daily observations</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |
| Vehicle movements on site              | <ul style="list-style-type: none"> <li>- Hazards to workers (collisions leading to injuries)</li> </ul>   | <ul style="list-style-type: none"> <li>- Speed limit of 40km/hr;</li> <li>- Site induction and training of staff; and</li> <li>- Reversing of vehicles overseen with appropriate warnings (lights / sounds).</li> </ul>  | <ul style="list-style-type: none"> <li>- Daily observations</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |
| Human environment                      | <ul style="list-style-type: none"> <li>- Traffic and transport congestion</li> </ul>                      | <ul style="list-style-type: none"> <li>- Flagman will be required during road construction works and signage to inform the public of ongoing activities, especially during closure of crossings and if traffic detours are required; and</li> <li>- Information on construction activities is required to be advertised in the local newspapers after agreements are made with the Walvis Bay Municipality.</li> </ul> | <ul style="list-style-type: none"> <li>- Daily observations</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |
|  | <ul style="list-style-type: none"> <li>- Traffic and transport vehicle accidents</li> </ul>               | <ul style="list-style-type: none"> <li>- Flagman will be required during road construction works and signage to inform the public of ongoing activities.</li> </ul>  | <ul style="list-style-type: none"> <li>- Daily observations</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |

### Environmental management plan for the upgrade of Walvis Bay fuel line

Bigen Infrastructure Services Namibia (Pty) Ltd on behalf of the Ministry of Works and Transport

| Receptors                                       | Potential impacts  | Management/mitigation measures   | Monitoring requirements   | Responsibility   |
|---|--|--|---|--|
| Air quality                                     | <ul style="list-style-type: none"> <li>- Air quality and dust impacts on the Walvis Bay residents and community</li> </ul> | <ul style="list-style-type: none"> <li>- Dust suppression;</li> <li>- Reduced speed limits around public;</li> <li>- Maintenance and daily checks on construction vehicles and machinery; and</li> <li>- Restrictions to public entering the construction site.</li> </ul>   | <ul style="list-style-type: none"> <li>- Daily observations</li> </ul>                            | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |
|   | <ul style="list-style-type: none"> <li>- Air quality and dust impacts on the construction workforce</li> </ul>             | <ul style="list-style-type: none"> <li>- Dust suppression;</li> <li>- Reduced speed limits around workforce;</li> <li>- Maintenance and daily checks on construction vehicles and machinery ; and</li> <li>- Issuing and wearing of the correct PPE.</li> </ul>  | <ul style="list-style-type: none"> <li>- Daily observations</li> </ul>                            | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |
| General construction activities: heritage sites | <ul style="list-style-type: none"> <li>- Heritage impacts on artefacts, monuments and graves</li> </ul>                    | <ul style="list-style-type: none"> <li>- The contractor's vehicles, materials and employees must never venture or operate within 50 m of the heritage monuments;</li> <li>- Should a grave be unearthed the Project manager should contact the National Heritage Council who will advise what to do;</li> <li>- Awareness will need to be raised with the staff on a continual basis in this regard to keep them away from heritage sites, particularly the the Old Walvis Bay cemetery (Muldrene); and</li> </ul> | <ul style="list-style-type: none"> <li>- Case by case</li> <li>- Chance find procedure</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> </ul> |

## Environmental management plan for the upgrade of Walvis Bay fuel line

Bigen Infrastructure Services Namibia (Pty) Ltd on behalf of the Ministry of Works and Transport

| Receptors | Potential impacts | Management/mitigation measures   | Monitoring requirements | Responsibility |
|-----------|-------------------|--|-------------------------|----------------|
|           |                   | - If required additional demarcation signage will be erected to keep staff away from the site. |                         |                |

### 3 ENVIRONMENTAL MANAGEMENT PRINCIPLES

#### 3.1 CONTINUAL IMPROVEMENT

The Proponent’s management team is responsible for reviewing and updating this EMP, which will be supported by the regular reports from the contractor on a monthly basis. As part of this review process, the regular reports will be reviewed, identifying any trends or significant areas of concern, as well as measures implemented to manage / resolve environmental or social issues. Compliance and legislative changes will be reviewed, and lessons learnt will be captured. The EMP will be amended as required and follow up training, awareness or updates will be provided.

Ongoing hazard identification through the review of the EMP and supporting management plans and SOPs will ensure environmental impacts are avoided or minimised to as low as reasonably practicable as part of the continuous improvement of the environmental management system (EMS).

#### 3.2 BEST PRACTICE

The best practice management measures that will be complied with in during construction activities, are listed in summary in Table 3.

**Table 3 - A list of environment best practice measures to be implemented**

| Environmental aspect  | Best practice requirement  |
|---|--|
| Pollution prevention control                                  | <ul style="list-style-type: none"> <li>- Equipment to be maintained and serviced regularly;</li> <li>- Refueling at designated or approved locations;</li> <li>- Spill kits available wherever the risk of loss of containment is identified;</li> <li>- Bunds to be at least 110 % of the container; and</li> <li>- Good housekeeping.</li> </ul> |
| Solid waste management  | <ul style="list-style-type: none"> <li>- Good housekeeping (no littering);</li> <li>- Designated waste collection areas on site and one central location;</li> <li>- Bins labelled;</li> <li>- Waste to be separated and kept clean and tidy; and</li> <li>- Waste bins emptied on regular basis.</li> </ul>                                       |
| Storage of fuels, oils, chemicals and other hazardous liquids | <ul style="list-style-type: none"> <li>- Storage tanks will be suitable and labelled for the liquid being stored;</li> <li>- Bunds to be at least 110 % of the container; and</li> <li>- Daily inspections of tanks.</li> </ul>  |

| <b>Environmental aspect</b> | <b>Best practice requirement</b>  |
|-----------------------------|---|
| Energy efficiency           | <ul style="list-style-type: none"> <li>- Equipment to be maintained and serviced regularly; and</li> <li>turn off plant and equipment when not in use.</li> </ul>   |
| Air quality                 | <ul style="list-style-type: none"> <li>- Turn off equipment when not in use; and</li> <li>- Equipment to be maintained and serviced regularly</li> </ul>  |
| Noise and vibration         | <ul style="list-style-type: none"> <li>- Equipment will be maintained on a regular basis;</li> <li>- Construction activities only to take place during the day;</li> <li>- Construction activities to be avoided on Sundays and public holidays.</li> </ul> |

### 3.3 ENVIRONMENTAL MONITORING

A monitoring and evaluation program will be used in line with internal occupational health, safety and environment (OHSE) standards to evaluate environmental performance and promote continual improvement. Monitoring also supports environmental management on-site to evaluate how effective the environmental management has been, over an extended period of time.

An environmental monitoring schedule will be put in place for the construction based on the recommendations as part of this assessment process.

The monitoring program will comprise inter alia:

- Noise and vibration monitoring (e.g., effect on mammals);
- Water quality monitoring;
- Biodiversity monitoring (e.g., flora and fauna);
- Air quality monitoring;
- Carbon footprint monitoring; and
- General environmental compliance.

The DEO will be tasked with conducting the monitoring with the support of the IECO.



## 4 COMMUNICATION AND TRAINING

### 4.1 INTRODUCTION

The Project will involve various construction activities and the operations of the development will interface with sensitive local environmental receptors. It is important that regular communications with the local communities are undertaken, and feedback is obtained, as well as regular communications within the Project team during construction to ensure environmental awareness is communicated.

### 4.2 COMMUNICATIONS

#### 4.2.1 ENVIRONMENTAL COMMUNICATIONS: PROPONENT TEAM

During construction, the contractor's, through the support from the ER, IECO and DEO, shall communicate site wide environmental issues to the Project team through the following means:

- Site induction (see section 4.4.1);
- Environmental posters and site notices;
- Method statement and risk assessment briefings (see section 6.2);
- Audits and site inspections;
- Toolbox talks, including instruction on incident response procedures; and
- Briefings on key Project specific environmental issues.

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

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

#### 4.2.2 ENVIRONMENTAL COMMUNICATIONS: COMMUNITY AND STAKEHOLDERS

The contractor's Project manager shall represent the Project and shall liaise with the local communities and stakeholders during the construction phase and through the operations phase where necessary. Clear contact details of the proponent and Project manager shall be circulated around the community, in case there should be any questions, concerns or complaints. This EMP will be published on ECC<sub>2</sub>'s and the Proponent's website.

#### 4.2.3 LIASON WITH LOCAL AUTHORITY AND LANDOWNERS

The ER shall stay in regular contact throughout the construction period with all local authorities and landowners along the Project limits. The contractor will be required to communicate with local

authorities, the Dorob National Park, the Ministry of Environment, Forestry and Tourism, and landowners to keep them abreast of the progress of the construction activities and to let them know when and where construction activities are planned to occur. Through this regular communication, the authorities and landowners will know when to expect the contractor to be working in their respective areas.

### 4.3 COMPLAINTS HANDLING AND RECORDING

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

The contractor shall maintain a complaint's register that will detail the name and contact details of the complainant, date and time of the complaint, nature of complaint, action taken to resolve issues, and date of complaint handover. The contractor's Project manager shall be responsible for nominating the correct personnel to co-ordinate and resolve the issue.

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

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

### 4.4 TRAINING AND AWARENESS

All personnel working on the Project shall be competent to perform tasks that can minimise environmental impacts should they occur. Competence is defined in terms of appropriate education, training and experience.

#### 4.4.1 SITE INDUCTION

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

The contractor shall ensure a register of completed training is maintained and issued to the IECO monthly or when there are additions.

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

- A general site-specific induction that outlines:
  - o What is meant by “environment” and “social”;
  - o Why the environment needs to be protected and conserved;
  - o How construction activities can impact on the environment;
  - o What can be done to mitigate against such impacts;
  - o Awareness about the environmental sensitivity of the Dorob National Park and Namib Desert;
  - o Clear instructions about “No-Go” areas. No work is to be performed outside of the existing railway servitude, and no vehicles or persons are to travel outside of existing roads, access roads, railway servitude or the contractor’s offices/camp;
  - o Awareness about national heritage sites in the vicinity of the Project site;
  - o No trapping, poisoning or shooting of animals is allowed;
  - o No removal or disturbance of vegetation or the land area outside of the existing railway servitude and minimisation of disturbance of vegetation within the servitude wherever possible. This includes no chopping down of trees for firewood;
  - o Information regarding all way leave conditions;
  - o Instructions on proper handling of hazardous materials and on proper storage of these materials and machinery;
  - o Health & safety instruction, including the importance of wearing personal protective equipment (PPE), about only using designated toilet, washing and eating facilities and areas and Information about HIV / AIDS, sexually transmitted diseases (STDs), tuberculosis and preventative measures (e.g. free condoms to all camp staff);
- The inductee’s role and responsibilities with respect to implementing the EMP;
- The site environmental rules;
- Details of how to deal with, and who to contact if environmental problems should they occur;
- Basic vegetation clearing principals and species identification sheets;
- The potential consequences of non-compliance with this EMP and relevant statutory requirements; and
- The role of responsible people for the Project.

All staff should receive an induction refresher course on a quarterly basis. Due to the environmental sensitivity of the landscape adjacent to the railway, a representative from the Ministry of Environment, Forestry and Tourism shall be given the opportunity to review and comment upon the induction course materials prior to the contractor utilising them for the Project.

The following person should be contacted:

Mr. Siegfried Gawiseb  
Chief Control Warden for Erongo Region  
Ministry of Environment and Tourism  
[Siegfried.gawiseb@met.gov.na](mailto:Siegfried.gawiseb@met.gov.na)  
Tel: +264 64 404 576  
P/Bag 5010  
Swakopmund

#### 4.4.2 TOOLBOX TALKS

The contractor, under the leadership of the contractor’s DEO, shall incorporate pertinent environmental, health & safety topics into the contractor’s daily toolbox talks. The toolbox topics could include reminders of topics covered in the induction course or new topics, such as: reminders about the importance of staying within the existing railway servitude, and only travelling on existing roads and access roads; reminders about the proper handling of hazardous materials; reminders about only using designated toilet, washing and eating facilities; information about HIV / AIDS and STDs.

#### 4.5 ENVIRONMENTAL EMERGENCY AND RESPONSE

The contractor’s Project manager (PM) will be the primary contact person in the event of an environmental emergency, who shall immediately contact the DEO, ER and IECO to contain the impact. The PM, ER and IECO have the authority and independence to request reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse environmental impact be anticipated.

The contractor shall ensure that his employees are adequately trained to manage emergency situations involving spillages or leaks effectively and safely of hazardous or damaging materials, and fires. In addition to understanding the procedures to be followed, the Contractor must ensure that appropriate PPE is provided for such situations, as well as the equipment required for effective clean-ups and fire suppression. Such equipment must be available within quick access of where the risks for spillages or fires could occur.

In the event of an incident that requires the emergency services, the services that should be contacted will be sourced by the PM or ER and listed in Table 4 prior to the Project commencing.

**Table 4 - Emergency services contact telephone numbers**

| Town       | Ambulance            | Police              | Fire Brigade    |
|------------|----------------------|---------------------|-----------------|
| Walvis Bay | +264 (0) 64 129 6280 | +264 (0) 64 219 048 | +264 (0) 81 922 |

For large-scale spills and other significant environmental incidents, the fire services shall be contacted as required and the Ministry of Environment, Forestry and Tourism (MEFT) office informed of the incident (telephone +264 61 284 2111). All correspondence with MEFT should be undertaken by the PM as guided by the DEO, ER and IECO.

For the clean-up of smaller spills, the relevant material safety data sheet (MSDS) should be obtained online and consulted to determine the appropriate clean-up procedure. Basic spill response training must be provided as part of the site environmental induction, and spill response equipment, including relevant MSDS copies, must be provided in areas where potentially environmentally hazardous chemicals may be used.

All environmental incidents, regardless of their size or significance, should be recorded and reported to the PM, DEO, ER and IECO during the environmental meetings held.

Working arrangements

### 4.6 WORKING HOURS

The Contractor will be restricted to working between the hours of 06h30 – 18h30 during summer and 07h00 – 17h30 during winter, Monday to Saturday. The contractor shall not work on Sundays or public holidays.

Any variations to the above must be reviewed and approved in advance by the ER, MoWT, and local authorities if the work is to occur in or near to urban areas. Such variations must comply with the Labour Act and any other relevant legislation.

### 4.7 CONTRACTOR'S OFFICES/CAMP AND FACILITIES WITHIN THE RAILWAY SERVITUDE

#### 4.7.1 LOCATION OF CONTRACTOR'S OFFICE/CAMP

The contractor will not be permitted to establish his contractor's office/camp in the railway servitude. It is the contractor's responsibility to communicate with landowners and find one who agrees to the contractor's offices/camp being established on their property. the contractor's offices/camp shall be fenced off and have a lockable gate for security purposes.

#### 4.7.2 EMPLOYEE FACILITIES

The contractor shall provide a designated dining area with cooking facilities, tables, chairs, trash bins and washing facilities inside the contractor's office/camp. Shaded eating facilities shall also be provided for dining and break times, within the servitude.

Cooking facilities shall be located a safe distance from fuel storage areas. Fires shall only be permitted in designated, safe areas within the contractor's office/camp.

The office/camp shall include toilets at a minimum ratio of 1 toilet per 15 workers, for both male and female employees. The toilets must be maintained in a clean, hygienic condition, and stocked with toilet paper. The toilets should not be located in depressed areas prone to flooding. The toilets must be secured to the ground. The waste cannot under any circumstances be discharged into the environment. Hand washing facilities must be provided near the toilets. Toilets and hand washing facilities must also be provided in the railway servitude near construction activities, as per above-mentioned requirements.

Enclosed sleeping areas with beds and adequate bedding, as well as adequate privacy, must be provided at the camp for all employees, if required.

Security guards shall be provided by the contractor to look after the employees' personal property and facilities, as well as the other areas of the contractor's office/camp.

#### 4.8 STORAGE OF PLANT, EQUIPMENT AND MATERIALS

##### 4.8.1 MATERIAL STORAGE AT THE CONTRACTOR'S OFFICE/CAMP AND WITHIN THE RAILWAY SERVITUDE

All construction materials will be stored within the contractor's office/camp when practical or within dedicated lay down areas for per way construction and within the existing railway servitude. All storage areas are to be maintained in a neat and tidy state.

Stockpiles of ballast and other materials shall have a minimum stockpile base width while maintaining natural, stable stockpile side slopes.

The material stockpiles shall not pose a safety risk in any way for persons or vehicles moving in their vicinity.

Hazardous substances shall be stored in secondary containers. Material safety data sheets shall be available on site at all times.

A weatherproof, impervious container / skip shall be provided at the office/camp for the temporary storage of hazardous waste. The container / skip shall only be disposed of at a landfill that is licensed to receive hazardous waste. The contractor shall provide the ER with a copy of the certificate of safe disposal after each disposal of the container / skip.

##### 4.8.2 FUEL STORAGE AND RE-FUELLING AT THE CONTRACTOR'S OFFICE/CAMP

Fuel will typically be delivered to the contractor's office/camp in a suitably sized fuel storage / transport tank. The contractor must ensure that fuel tanks are in good condition without leaks. Fuel tanks must be located on an impermeable, concrete slab that is bunded. The storage volume of the bunded area must be 110 % greater than the volume of the storage tank (or combined volume of

storage tanks). The tank(s) shall be inspected daily for leaks. Tanks should be no larger than 22 m<sup>3</sup>. A leaking tank must be repaired immediately or replaced immediately.

The fuel storage and re-fuelling area shall be a designated area where only authorised employees are allowed. All the PPE correct and applicable warning signage must be in place. The MSDS, consumer installation certificate from the Ministry of Mines and Energy (MME) and tank capacity must be displayed.

The contractor must provide adequate fire suppression equipment at the fuel storage and re-fuelling area.

#### 4.9 TRANSPORT OF CONSTRUCTION MATERIALS AND MACHINERY TO AND FROM THE RAILWAY SERVITUDE

It is important that no new access or service roads or tracks will be constructed or inadvertently created for the purposes of this Project. Only existing roads to the railway servitude will be utilised by construction-related vehicles and machinery.

Any area located outside of the railway servitude, contractor's camp, or existing access roads will be considered as a No-Go area for vehicles, materials and employees.

If for whatever reason the contractor believes it is necessary to venture into a No-Go area, then the ER and IECO must first be notified. The IECO must then notify MEFT and national park managers (i.e. if in national park areas) to review the situation and obtain approval or denial. Furthermore, a biodiversity specialist may need to be hired to study the specific site to be disturbed and the potential environmental impacts of such disturbance.

If by accident a No-Go area is ventured into by the contractor, then the contractor must immediately inform the ER and IECO about such incursion and disturbance. The IECO must then notify MEFT and national park managers, and the No-Go area must be inspected for potential impacts and damage, and the way forward determined.

#### 4.10 EXISTING NAMWATER PIPELINE CROSSINGS

The following has been extracted from the original EMP (Hartz, C., 2017). There are two NamWater pipelines that cross the existing railway line. These pipelines include:

- The pipeline from the Areva desalination plant to the Swakopmund Reservoir crosses under the railway line at one point located just east of Swakopmund. See Figure 2 below.
- The Kuiseb – Swakopmund pipeline runs from the Swakopmund Reservoir to a reservoir located south of the Dune 7 (east of Walvis Bay) and then continues southward. This pipeline crosses under the railway line in two locations: i) just south of the Swakopmund River, and ii) where the railway makes a ninety degree turn towards Walvis Bay, near Dune 7.

Details about the crossings and conditions for working in the vicinity of the crossings are to be obtained from NamWater when the application for Way of Leave is submitted by the ER and approved by NamWater. The contractor and ER are to consult closely with NamWater prior to and during construction activities occurring in the pipeline crossing areas.



**Figure 2 - Namwater pipeline from Areva Desalination Plant that crosses under the railway just east of Swakopmund (from: Hartz, C., 2017)**



## 5 REPORTING COMPLIANCE AND ENFORCEMENT

### 5.1 ENVIRONMENTAL RISKS AND MITIGATION MEASURES

The register of environmental risks and issues, which identifies mitigation and monitoring measures, as well as roles responsible will be subject to regular review by the ER, IECO and contractor together with the DEO and updated when necessary. The contractor, ER, IECO and DEO will use this register to undertake monthly inspections to ensure the Project is compliant with this EMP.

### 5.2 CONSTRUCTION: ENVIRONMENTAL INSPECTIONS & COMPLIANCE MONITORING

A copy of this EMP shall be on site throughout the construction works and shall be available upon request. It is the responsibility of the contractor, ER and DEO to ensure this EMP is complied with through their daily roles. Daily inspections will be undertaken by the contractor or DEO. Any environmental problems or risks identified shall be notified to the ER and IECO and actioned as soon as is reasonably practicable.

### 5.3 MONTHLY COMPLIANCE MONITORING

Monthly inspections shall be undertaken by the DEO / ER and contractor's PM to check that the standards and procedures set out in this EMP are being complied with and pollution control measures are in place and working correctly.

Monthly Inspection and Compliance Reports shall be produced (Refer: Annexure A (1) and A (2)). The inspection and compliance reports shall be completed by the DEO and issued to the PM, ER and IECO who will review them. The IECO will conduct monthly audits on the contractors activities, in line with the requirements of this EMP.

### 5.4 OPERATIONS: ENVIRONMENTAL INSPECTIONS & COMPLIANCE MONITORING

Routine inspections of the all the construction activities and camps will be undertaken by the Proponent, PM, ER, DEO and IECO. The frequency will be determined by the onsite construction activities taking place. All operations will be inspected to ensure; no significant environmental damage has been caused; and no leaks exist in fuel or chemical containers, or spills have occurred, or any other significant impact has taken place that is associated with the upgrade, construction, repair and strengthening work being undertaken. For the construction phase, monthly inspection and compliance report templates are included in Annex A (1) and A (2) respectively and must be completed. During any maintenance activities, the contractor shall fill in the compliance report Annex A (3). These shall be submitted to the ER and IECO. These inspection, compliance and maintenance reports shall contain a brief description of any areas of non-conformance with the contract specification, the reason for the non-conformance, the responsible party, the result (consequence), the corrective action taken, and any necessary follow-up measures required.

### 5.5 REPORTING

There shall be a requirement to ensure that any incident or non-compliance, including any environmental issue / impact, failure of equipment or accident or environmental incident, is reported to the PM, ER, DEO and IECO. The contractor shall maintain a copy of the EMP on site throughout the duration of construction. The contractors DEO, shall maintain records on site throughout the duration of construction of the following:

- Significant incidents (e.g. spills, impacts, health and safety) as well as actions taken;
- A register of public complaints in which all complaints are recorded, as well as descriptions of remedial actions taken by the contractor;
- Records of staff attending, and the content presented at all training and awareness raising sessions, such as the induction course, induction rehearse course, and daily toolbox talks; and
- A list of all hazardous materials stored on site, with material safety data sheets (MSDS) provided for each.

### 5.6 NON-COMPLIANCE

Where it has been identified that works are not compliant with this EMP, the contractor shall employ corrective actions so that the works return to being compliant as soon as possible. In instances where the requirements of the EMP are not upheld, a non-conformance and corrective action notice shall be produced. The notice shall be generated during the inspections and the contractor and DEO shall be responsible for ensuring a corrective action plan is established and implemented to address the identified shortcoming. A non-compliance event/situation, for example, is considered if:

- There is evidence of a contravention of this EMP and associated indicators or objectives;
- The contractor or DEO have failed to comply with corrective or other instructions issued by the ER or IECO or qualified authority; or
- The contractor fails to respond to complaints from the public.

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

### 5.7 DISCIPLINARY ACTION

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

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

The disciplinary action shall be determined according to the nature and extend of the transgression / non-compliance, and penalties are to be weighed against the severity of the incident. Penalties and fines are listed in the original EMP (Hartz, C., 2017) and for consistency can also be applied to this amended EMP for the fuel railway upgrade in Walvis Bay.

The contractor, under the leadership of the DEO, shall ensure that all employees of the contractor, sub-contractors, and suppliers are familiar with, understand, and adhere to this EMP. Failure by any employee of the contractor, sub-contractors, or suppliers to comply with the EMP shall be considered sufficient cause for the ER to instruct the contractor to have the relevant employee removed from the site. MoWT may also order the contractor to suspend part or all of the works if there is non-compliance with the EMP. Such suspension shall be lifted only when the offending procedure or requirement is corrected and/or if required remedial measures are put in place.

Penalties for the incidents described below will be imposed by the ER on the contractor and/or his/her sub-contractors and suppliers after consultation with the IECO. Further penalties will be enforced through contract arrangement, and the fines and penalties will be confirmed and clearly set out in subcontractors' contracts prior to commencing with the work.

| No. | Type of Incident  | Penalty Amount                                   |
|-----|---|--|
| 1   | Any employees, vehicle, machinery, etc. related to the Contractor's activities operating outside the designated project boundaries or within the No-Go areas. | N\$4,000   |
| 2   | Damage to indigenous vegetation outside the railway servitude and limits of the Contractor's camp   | The cost of restoration plus N\$5,000            |
| 3   | Damage to sensitive environments (i.e. Namib Desert and Dorob National Park) outside the railway servitude and limits of the Contractor's camp                | The cost of restoration plus N\$5,000            |
| 4   | Damage to national heritage monument sites  | Up to a maximum of N\$100,000 per incident       |
| 5   | Damage to fauna   | Up to a maximum of N\$4,000 per incident         |
| 6   | Oil, grease, fuel or hazardous fluid spills   | The cost of the clean-up operation plus N\$3,000 |
| 7   | Inappropriate methods of refuelling that cause spillages  | N\$2,000   |
| 8   | Litter on site  | N\$1,000   |
| 9   | Disposal of waste other than described in the EMP and approved by the IECO or ER  | N\$5,000   |
| 10  | Employees not making use of toilet facilities provided on site  | N\$1,000   |

## 5.8 CONTROL OF RECORDS

A range of environmental records, for example waste management records are required and specified throughout this EMP. Environmental records shall be maintained, either in hard copy or electronic format and shall be readily identifiable, retrievable and protected against damage, deterioration or loss.

## 5.9 ENVIRONMENTAL PERMITS

### 5.9.1 ECOLOGY

Article 23 (b) of the Forest Act, 2001 and associated Regulations, states that the clearance of vegetation on an area of land greater than 15 hectares will require a permit. This will include the removal of any protected or important species. This is not anticipated to be necessary during the amended works for the fuel railway line upgrade in Walvis Bay but an application shall be made to the Directorate of Forestry, under MEFT and approval will be in place, prior to construction activities commencing if a protected species are confirmed for removal/relocation.

### 5.9.2 HERITAGE

Pre-colonial archaeological sites are governed by the National Heritage Act (27 of 2004) and may be investigated or destroyed under permit issued by the National Heritage Council. The precautionary treatment of graves applies in all cases, but the more recent Christian graves at Okanguati are governed by the Burial Place Ordinance (27 of 1966). Destruction or the exhumation of such graves with the purpose to reinter the remains requires a permit issued by the Office of the President of Namibia.

Two of the closest national heritage sites to the Walvis Bay – Kranzberg railway stations line route are identified on the website of the National Heritage Council as monuments 076/1978 (see Figure 3) and 077/1978 (see Figure 4). Monument 076/1978 are regimental badges that were created with stones in 1915. There is a viewing platform at the site. The monument is located 27 km east of Swakopmund, in between the railway and the B2 highway, 80 m south of the railway.

Monument 077/1978 is a war cemetery that was established in 1915. The site is 46 km east of Swakopmund, approximately 500 m northwest of the railway line.

For the upgrade of the fuel railway line in Walvis Bay, from NamPort to the bulk suppliers infrastructure, the Old Walvis Bay cemetery (Muldrene) is located to the north west of the railway servitude, within the industrial area. The graves are older than 50 years and classified as a heritage site. Figure 5 provides a visual overview of the condition of the cemetery.

The contractor's vehicles, materials and employees must never venture or operate within 50 m of the heritage monuments.



**Figure 3 - National Heritage Monument 076/1978**



**Figure 4 - National Heritage Monument 077/1978**



**Figure 5 - The Old Walvis Bay cemetery (Muldrene)**

## 6 ENVIRONMENTAL AND SOCIAL MANAGEMENT

### 6.1 OBJECTIVES AND TARGETS

Environmental objectives for the Project are as follows:

- Zero pollution incidents;
- Minimise waste sent to landfill or being burnt;
- Minimise disruption to local communities (and therefore complaints);
- Protect local flora and fauna;
- Protect the aquifer and springs; and
- Use natural resources effectively and efficiently.

Procedures for monitoring processes against the project environmental objectives will be agreed by the contractor with the ER and IECCO.

### 6.2 CONSTRUCTION PHASE

#### 6.2.1 METHOD STATEMENT AND RISK ASSESSMENTS

The contractor shall prepare method statements and risk assessments and acquire the ER's approval before commencing work. A method statement and risk assessment is required for each and every activity, including site establishment. The following minimum information will be required in each method statement:

- Goal of activity;
- Dangers identified;
- Risk assessment and safety measures to be instituted such as protection of work sites in detail, i.e. flagmen, detonators, red banners, distances placed from work site etc.;
- Measures to accommodate environmental and social requirements;
- Work method;
- Material to be used;
- Quality assurance procedure to ensure compliance to specifications;
- Reference to the relevant specifications; and
- Reference to other relevant method statements.

Inspectors and workforce shall be trained to execute the work in accordance with the approved method statements and a copy of the method statement shall be available on the site where the work is executed.

#### 6.2.2 MAINTENANCE OF CONSTRUCTION AREAS

The construction area shall be established and managed by the contractor to minimise impacts on the environment and society, and shall include the following considerations:

- Plant and equipment shall be brought onto site only as and when required;

- Plant and equipment shall be stored in specific areas taking into consideration impacts on local residents and groundwater (e.g. start-up of equipment, noise levels, flooding and spill runoff to aquifer considerations);
- Amenities (e.g. portable toilets) shall be provided and set up in a suitable location and secured to the ground to avoid impacts on local residents;
- Waste collection area and material storage areas shall be set up at specific sites to avoid impacts on local communities; and
- Lighting shall only be used when necessary and will be designed to minimise spillage of light and orientated away from community areas.

A 'good housekeeping' policy shall be adopted by the contractor across the construction and maintenance working areas, and will include the following requirements:

- Fires shall only be permitted in designated, safe areas within the contractor's office/camp;
- Considerate behaviour of all site staff;
- Maintenance of staff welfare facilities;
- Removal of food waste and other rubbish at frequent intervals; and
- No littering or discarding of random solid waste.
- Under no circumstances can solid waste be burned, dumped or buried at the office/camp or railway servitude.

## **7 GROUNDWATER AND SURFACE WATER MANAGEMENT PLAN**

### 7.1 INTRODUCTION

Chemical and waste spills must be contained, so as not to contaminate the soil, surface water or groundwater. Any contact with surface water or groundwater must be treated with exceptional care and reported immediately, so as to minimize the potential for contamination of an aquifer or in the case of Walvis Bay, potential seepage to seawater. It is important to limit the potential for wastewater seepage to surface water or groundwater.

This groundwater and surface water management plan outlines appropriate water management measures, monitoring programs and reporting procedures to be implemented.

### 7.2 OBJECTIVES

This groundwater and surface water management plan has been prepared to minimise potential impacts on groundwater and surface water resulting from the construction activities. It is important to report any contact with or contamination of groundwater or surface water to the DEO, PM or ER as soon as possible.

### 7.3 RESPONSIBILITIES

#### **WORKFORCE AND ALL CONTRACTORS**

Required to take all reasonable measures to prevent the discharge of sediments and pollutants from the site into groundwater and surface water sources. Report any contact with groundwater or surface water to the DEO.

#### **DESIGNATED ENVIRONMENTAL OFFICE**

Will ensure that the objectives listed above are being met and provide performance feedback to the manager.

### 7.4 GROUNDWATER AND SURFACE WATER MANAGEMENT MEASURES

The groundwater and surface water management plan measures are designed to minimise the runoff of sediment-laden or polluted water/effluent into the surrounding environment. Construction activities that could potentially impact groundwater or surface water quality include:

- Chemical spills;
- Refueling; and
- Poor resource stewardship practices.

The following requirements are to be met to ensure that groundwater or surface water is not contaminated:



- Fuel/oil and chemicals must be safely stored and removed in impermeable bunds or drip trays; and
- Any contact groundwater or surface water must be treated with exceptional care and reported immediately, so as to minimize the potential for contamination of an aquifer

**Table 5 - Water quality mitigation measures**

|  |   |
|--|---|
| <b>Responsibility</b>  | <ul style="list-style-type: none"> <li>- Project manager</li> <li>- Employees</li> </ul>  |
| <b>Potential issues or impacts</b>   | <ul style="list-style-type: none"> <li>- Groundwater or surface water contamination due to incidental hydrocarbon or chemical spills</li> </ul>   |
| <b>Protection of groundwater or surface water</b>  | <ul style="list-style-type: none"> <li>- Water saving measures should be always applicable.</li> <li>- No taps or pipes left to run, leaks to be detected immediately.</li> <li>- Vehicles only to be washed with buckets, not running water.</li> <li>- Water, especially contaminated, should not be allowed to pool or stagnant.</li> </ul>  |
| <b>Sewage and grey water from temporary portable toilets on site</b>   | <ul style="list-style-type: none"> <li>- Chemical toilets should be provided, and the veld should not be used as an alternative.</li> <li>- If grey water can be collected from ablution facilities at the campsite it should be recycled and: <ul style="list-style-type: none"> <li>o Used for dust suppression</li> <li>o Used to clean equipment</li> </ul> </li> <li>- Ensuring that during construction activities drainage is good and water does not pool.</li> </ul>   |
| <b>Inefficient use of water resources</b>  | <ul style="list-style-type: none"> <li>- To ensure compliance with all legal obligations.</li> <li>- Refueling shall be undertaken in a designated area.</li> <li>- All vehicles and machinery undergoing maintenance must have drip trays to collect leakages of lubricants and oil during any field repairs or emergency maintenance.</li> <li>- In the event of pollution, polluted soils must be collected and disposed of at an approved site.</li> <li>- A 'good housekeeping' policy shall be adopted across the construction area.</li> </ul> |
| <b>Any hazardous fluid or lubricating chemicals used could enter the aquifer environment causing pollution</b> | <ul style="list-style-type: none"> <li>- All chemicals, bulk fuels, oils and grease and any other hazardous substance, will be stored and handled as per all applicable legislation and national standards.</li> <li>- Portable chemical toilets will be provided during the construction phase. They will be routinely cleaned, and sewage disposed of at a licenced sewage treatment plant with the safe disposal certificate to be provided..</li> <li>- Clean up spills within 24 hours.</li> </ul>   |

## 7.5 GROUNDWATER AND SURFACE WATER QUALITY MONITORING

Every effort must be made throughout to preserve the quality of groundwater and surface water sources that the Proponent may impact. Containment of waste and chemicals and the correct

disposal thereof must be of an acceptable standard. Personnel must report any unusual conditions and intersection with groundwater or surface water immediately to the DEO.

The Department of Water Affairs require quarterly reporting for water levels and quality of water from the sources for which a permit was required, namely, for abstraction permits and discharge permits:

1. Maintain a record of all abstracted volumes and report to DWA / MAWLR as per permit conditions
2. Maintain a monthly water balance
3. Submit quarterly water quality tests for water and monitoring boreholes.

## 8 NOISE AND DUST MANAGEMENT PLAN

### 8.1.1 COMMUNITY NUISANCES AND HAZARDS

All personnel shall respect the property and rights of local inhabitants at all times and shall treat all such persons with courtesy. A method statement shall be produced detailing the specific measures that are to be implemented to manage nuisances and hazards to the community. Measures are detailed in these next sections that shall be included in the method statement.

### 8.1.2 DUST CONTROL

The contractor shall minimise the generation of dust from transport and construction activities. If needed, construction and transport activities should be temporarily stopped during high wind conditions. The contractor will be required to do dust suppression by means of water carts on access roads.

### 8.1.3 NOISE CONTROL

Noise should be minimised as much as possible during construction works. The following measures shall be applied:

- Limit working hours to 06h30 – 18h30 during summer and 07h00 – 17h30 during winter, Monday to Saturday. No construction work on Sunday or public holidays.
- Inform local communities of scheduling and duration of noisy activities through notices or face-to-face communications.
- Regular maintenance and servicing of vehicles, plant, and equipment; and
- All plant to be shut down or throttled back between periods of use.

Any variations to the above must be reviewed and approved in advance by the ER, MoWT, and local authorities if the work is to occur in or near to urban areas. Such variations must comply with the Labour Act and any other relevant legislation.

The contractor shall comply with the World Health Organization (WHO) guidelines for the management of community noise (<http://apps.who.int/iris/handle/10665/66217>).

## 9 SPILL MANAGEMENT PLAN

### 9.1 INTRODUCTION

The uncontrolled release of fuels and other chemicals has the potential to result in the contamination of soil, groundwater, which may lead to serious environmental harm. On this basis, the storage and use of fuels or other chemicals must be managed to minimise the risk of a release, and measures must be in place to promptly address impacts should a release occur.

### 9.2 OBJECTIVES

This spill management plan has been prepared to minimise the potential for the uncontrolled release of fuels, oils and other chemicals. Preventative measures to minimise the potential for a spill are listed. Should a spill occur, this plan provides guidance for the proponent on the appropriate spill response measures.

### 9.3 ROLES AND RESPONSIBILITIES

#### **WORKFORCE AND ALL CONTRACTORS**

Required to implement the spill prevention and response measures listed below.

#### **PROJECT MANAGER/ DESIGNATED ENVIRONMENTAL OFFICER**

Required to ensure that appropriate spill prevention measures (listed below) are implemented and that any spills have been appropriately managed and reported.

### 9.4 SPILL PREVENTION MEASURES

The Contractor shall take all reasonable precautions to prevent fuel, oil and chemical whilst undertaking works on site. To this end, the Contractor shall ensure that:

- All necessary approvals are in place prior to bringing fuel, oil or chemicals on to site;
- All fuel, oil and chemical deliveries (if any) shall be supervised by a responsible person, who shall be trained to deal with any spills;
- All mobile plants shall be fuelled prior to coming on to the construction area, and when required, shall be refuelled in a designated area on an impermeable surface or over a spill/drip tray. A spill kit will be located at each designated refuelling point. A drip tray must also be available to catch any spills;
- Regular checks are performed to verify that no leaking or defective equipment is brought onto site
- Any vehicles and/or plant that has leaking lubricants, fuels or other hazardous fluids shall be repaired or removed from the site;
- A properly bunded wash bay shall be installed and approved by the IECO and monitored by the DEO, IECO and ER. The washing of vehicles and plant shall be kept to a minimum. Only

environmentally friendly, low phosphate, low nitrate, low foaming detergents will be allowed and must be approved by the IECO prior to use; and

- Equipment is maintained regularly to ensure that no fuel, oil or hydraulic leaks occur.

The Contractor and DEO shall ensure that there are sufficient absorbent material and spill kits available on site to manage accidental spills. The location of and instructions on how to use this equipment shall be included in the Site Induction and nominated personnel will be appropriately trained to use spill kits.

Any accidental spillages of fuels and oils, or other hazardous substances, shall be cleaned up immediately and be reported to the Contractor’s PM, ER, DEO and IECO. The following responses shall be undertaken:

- Minor spill: Only diesel and oil, with no human injury, contamination to water bodies or other environmental receptors. Contain and clean up the spill using available spill kit. The Contractor shall inform the ER, IECO, supplying the following information:
  - o Date, time, and location;
  - o Substance spilled and quantity;
  - o Before and after photographs; and
  - o Actions taken and any future remediation required.
- Major Spill: Resulting in human injury or/and environmental contamination and water body contamination. Personnel shall contain the spill if possible and report the spill to the Contractor’s PM, who shall then alert the appropriate emergency services (see **Error! Reference source not found.**), and the ER, DEO and IECO. In addition to the above information for a minor spill, the Contractor’s PM shall also be informed of any immediate dangers, e.g., fire, explosion, release of chemical fumes.

**Table 6 - Spill mitigation measures**

|                                    |  |
|------------------------------------|--|
| <b>Responsibility</b>              | <ul style="list-style-type: none"> <li>- Project manager</li> <li>- Employees</li> </ul>   |
| <b>Potential issues or impacts</b> | <ul style="list-style-type: none"> <li>- Soil, surface water and ground water contamination due to spillage</li> </ul>   |
| <b>Stored hazardous chemicals</b>  | <ul style="list-style-type: none"> <li>- Hazardous chemicals are to be stored in bunded areas.</li> <li>- Hazardous chemicals (such as fuels) are to be handled over areas provided with impervious surfaces.</li> <li>- Spills of hazardous chemicals are to be contained and cleaned-up to ensure protection of the environment.</li> <li>- All the necessary PPE required for the safe handling and use of petrochemicals and oils</li> </ul> |

|  |   |
|--|---|
|  | shall be provided to, and used or worn by, the onsite staff.  |
| <b>Machinery and equipment maintenance</b> | <ul style="list-style-type: none"> <li>- Major servicing of equipment shall be undertaken off site or in appropriately equipped workshops.</li> <li>- For small repairs and required maintenance activities all reasonable precautions to avoid oil and fuel spills must be taken (e.g., spill trays, impervious sheets).</li> <li>- Vehicles and machinery are to be regularly serviced to minimise oil and fuel leaks.</li> <li>- All the necessary PPE required for maintenance activities must be issued to staff whose duty it is to manage and maintain the machinery and equipment.</li> </ul> |

The table below (Table 7) shows the environmental risks and issues, and mitigation and monitoring measures for the spill of hazardous substances.

**Table 7 - Spill of Hazardous Substances**

|                                       |   |   |
|---------------------------------------|---|---|
| <b>Responsibility</b>                 | <ul style="list-style-type: none"> <li>- Site manager</li> <li>- DEO</li> <li>- IECO</li> </ul>   |   |
| <b>Potential issues or impacts</b>    | <ul style="list-style-type: none"> <li>- Hydrocarbon and chemical handling and storage can cause spillages that lead to groundwater contamination and soil contamination</li> </ul> |   |
| <b>Management/Mitigation measures</b> | Safe delivery and handling  | <ol style="list-style-type: none"> <li>1. Training employees and toolbox talks.</li> <li>2. Good housekeeping across the site.</li> <li>3. Fuel and chemicals are handled with care.</li> <li>4. Spill kits to be at designated areas across the site or available for use during refueling, fuel/chemical delivery, or use. Absorption material should be available and at hand. Where sawdust is used it should be cleaned up immediately and not left for long periods as this poses a fire hazard.</li> <li>5. Any major spill is reported once containment has been achieved.</li> <li>6. Equipment to be well maintained and serviced regularly.</li> </ol> |

|                                |  |   |
|--------------------------------|--|---|
|                                |  | 7. In the field, the use of hydrocarbons under 200 litres can be used for mobile refueling or servicing.  |
|                                | Storage  | <ol style="list-style-type: none"> <li>1. All tanks to be stored on a non-porous floor and within a bunded area.</li> <li>2. Bund to be capable of storing at least 110 % of the volume of the largest tank.</li> <li>3. All containers to be suitable for use and not damaged.</li> <li>4. Tanks are locked at all time.</li> <li>5. Spill kits available at storage locations and around the site at suitable locations.</li> </ol> |
|                                | Refuelling   | <ol style="list-style-type: none"> <li>1. Drip tray to be used during refueling of vehicles and on an impermeable flat surface where possible.</li> <li>2. A funnel should be available and used to avoid spillage during decanting.</li> </ol>   |
|                                | Rehabilitation   | Contaminated soils should be removed and deposited on lined storage areas for rehabilitation purposes. Rehabilitation can take place naturally by adding water, air and fertiliser. The process can be accelerated by using special additives that will breakdown the hydrocarbons.   |
| <b>Monitoring requirements</b> | <ul style="list-style-type: none"> <li>- Daily observations when fuels/chemicals are delivered and handled.</li> <li>- Supervision during refueling.</li> <li>- Weekly observations monitor containment and storage.</li> <li>- Establish an internal land clearing permit system that restricts advance clearing.</li> <li>- Monitor the level of hydrocarbons in contaminated soils after a year of rehabilitation.</li> <li>- Monitor each year until the soils are ready for re-use in revegetation projects.</li> </ul> |   |

#### 9.4.1 CONCRETE BATCHING

Concrete batching shall be performed on an impermeable surface that is properly bunded. The concrete batching area shall be located at least 25 m away from any surface water resource. If concrete trucks are employed, care must be taken to ensure the concrete is not poured onto the ground. Any spillage must be cleaned immediately.

### 9.4.2 FIRE PREVENTION

The contractor shall take all necessary precautions to prevent the ignition and spread of fires caused either deliberately or accidentally as a result of the work being performed (E.g. welding or grinding during steelworks).

The contractor shall prepare and implement a fire prevention plan for fire prevention and emergency management. The plan shall include, but shall not be limited to, the following:

- Potential sources of fire risk;
- Procedures to be followed to control an accidental fire; and
- Identification and location of fire-fighting equipment that will be maintained on site and deployed in the event of an emergency.

The site induction will include a briefing of the risks and potential consequences of starting fires. Employees shall also be warned of the risks of careless disposal of burning cigarette butts. The Project manager shall provide fire-fighting equipment, the location of which will be included in the site induction.

## 9.5 OPERATIONS

### 9.5.1 ENVIRONMENTAL MONITORING

The environmental monitoring during the operational phase will be the same as that described for the greater railroad upgrade Project. To avoid unnecessary repetition, the EMP for the greater Project (Hartz, C., 2017) will be used for this purpose as it covers the listed amendments.

### 9.5.2 ANNUAL OPERATION MAINTENANCE CHECKS

Annual maintenance checks will be the same as that described for the greater railroad upgrade Project. To avoid unnecessary repetition, the EMP for the greater Project (Hartz, C., 2017) will be used for this purpose.



## 10 WASTE MANAGEMENT PROGRAMME

### 10.1 INTRODUCTION

The EMA (2007), Section 3, paragraph (i) states that waste must be reduced, re-used and recycled where possible, therefore in accordance with the Act, waste generated as a result of the project shall be managed and dealt with in accordance with a waste management plan. This plan will be produced prior to construction activities commencing, shall cover any waste produced during the operational phase, and shall be updated prior to commencing the decommissioning phase.

The plan shall include the following information:

- Describe each waste type expected to be produced during construction activities;
- Estimate the quantity of each waste type;
- Identify the waste management action proposed for each waste stream, including re-using, recycling, recovery and disposal; and
- Designated areas to collect and separate waste.

The construction activities will generate both solid and liquid waste. The types of waste generated at the facility are classified as general and hazardous waste. All waste will eventually be removed from the Project site and will eventually be disposed of at the Walvis Bay waste disposal site.

### 10.2 OBJECTIVES

This waste management programme has been prepared to ensure the proper storage, transport, treatment, and disposal of waste and where possible will follow the waste hierarchy, which encourages waste avoidance and waste reduction followed by reuse, recycling, and reclamation, before waste treatment and waste disposal.

This plan shall be updated on a regular basis to ensure all waste and disposal route are identified. The aim of the waste management plan is to achieve sustainable waste management. The main purpose is to outline waste streams and identify the best treatment and disposal option for each one, applying the waste management hierarchy and avoiding as much waste as possible ending up at landfill or being burnt. In addition, it will also outline any potential economical and investment requirements for the treatment and / or disposal of waste.

### 10.3 ROLES AND RESPONSIBILITIES

#### **WORKFORCE AND ALL CONTRACTORS**

- Required to ensure that all waste generated during construction activities is removed and disposed of accordingly including providing evidence in the form of waste transfer receipts for the waste moved off-site;
- Ensure no windblown rubbish pollutes the environment; and
- Remove waste on a regular basis to prevent vermin.

**PROJECT MANAGER AND DESIGNATED ENVIRONMENTAL OFFICER**

- Required to inspect receipts and evidence of correct waste handling; and
- Review waste management practices regularly during the construction operations on site.

It is unlikely that hazardous material and wastes will be produced, however in the event that they do, they shall be managed in a safe and responsible manner so as to prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials. Hazardous and non-hazardous waste shall be stored separately at all times.

**Table 8 - Waste mitigation measures**

|                              |  |
|------------------------------|--|
| <b>Responsibility</b>        | <ul style="list-style-type: none"> <li>- Site manager</li> <li>- Employees</li> </ul>  |
| <b>Potential issues</b>      | <ul style="list-style-type: none"> <li>- Soil and surface or groundwater contamination due to spillage</li> <li>- Land and water pollution.</li> <li>- Loss of biodiversity</li> </ul>   |
| <b>Waste management plan</b> | <ul style="list-style-type: none"> <li>- The Proponent should compile a waste management plan that should address as a minimum the mitigation measures included below.</li> </ul>  |
| <b>Hazardous waste</b>       | <p>All vehicles (4x4 vehicles and trucks) and equipment on site should be provided with an oil spill kit:</p> <ul style="list-style-type: none"> <li>- All spillages should be cleaned immediately, and contaminated waste disposed of as it occurs in the appropriate hazardous waste containers (sealable drums) on-site and removed off-site at the end of each day to the closest recognised, appropriate hazardous waste disposal site in the vicinity or as soon as possible when working in remote areas; and</li> <li>- Once spill kits are utilised, the kits need to be replenished to always ensure full kit is available.</li> </ul> <p>Maintenance and washing of vehicles should be conducted at a suitable site/facility which adheres to the following:</p> <ul style="list-style-type: none"> <li>- The work area/facility should be lined to be impermeable; and</li> <li>- The work area/facility should have an oil-water separator (oil trap) to collect any run-off from the washing and or maintenance activities, or be equipped with an oil and water separation system.</li> </ul> <ul style="list-style-type: none"> <li>- Spilled oil or fuel should be treated as hazardous waste, disposed of as it occurs in the appropriate hazardous waste containers (sealable drums) on site, and removed off site at the end of each day to the closest recognised, appropriate</li> </ul> |

|                                  |   |
|----------------------------------|---|
|                                  | <p>hazardous waste disposal site in the vicinity or as soon as possible when working in remote areas. All such waste should be provided to specialists in the handling and treatment of such materials.</p>   |
| <p><b>Construction waste</b></p> | <ul style="list-style-type: none"> <li>- All hazardous substances (e.g., fuel, grease, oil, drilling fluids etc.) or chemicals should be stored in a specific location at the construction campsite on an impermeable surface which is bunded.</li> <li>- The existing rails that are replaced by new rails will be cut on-site to reduce their length, transported to designated storage areas for future re-use by TransNamib. Rails not suitable for re-use due to being damaged and worn, will be taken to a designated area from where it will be sold via auction by MoWT.</li> <li>- The old concrete sleepers that have been replaced will either be crushed on-site and worked into the railway embankment as recycled material or taken to a designated storage area for future use for maintenance by TransNamib.</li> <li>- All other construction-related waste will be transported and disposed of off-site in a permitted landfill facility.</li> </ul>  |
| <p><b>General waste</b></p>      | <p>The construction site should be kept tidy at all times. All domestic and general waste produced daily should be contained:</p> <ul style="list-style-type: none"> <li>- No waste may be buried or burned;</li> <li>- No waste is to be left uncontained, in suitable containers, over night;</li> <li>- Waste containers (bins) should be emptied regularly and removed from site to the nearest official waste disposal site. All recyclable waste needs to be taken to the nearest recycling depot if available;</li> <li>- A sufficient number of separate waste containers (bins) for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such;</li> <li>- Construction personnel should be sensitized to dispose of waste in a responsible manner and not to litter;</li> <li>- No waste may remain on site after the completion of the Project;</li> <li>- Scavenger-proof waste bins shall be provided throughout the camp, at the following locations (but limited to these locations): ablution area, dining area, sleeping area, office area, workshop area, storage and laydown areas, and at office/camp entrances /exits;</li> </ul> |

|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>- Waste will be collected, separated and stored in a designated area, where a temporary fence is required;</li> <li>- A waste storage container shall be provided at the office/camp into which the bins are dumped regularly;</li> <li>- Waste storage areas shall be kept clean and tidy at all times;</li> <li>- Waste shall be transported to a permitted landfill facility on a regular basis to avoid pests and bad odours; and</li> <li>- Under no circumstances can solid waste be burned, dumped, or buried at the office/camp or railway servitude</li> </ul>  |
| <b>Littering and environmental contamination from waste</b>          | <ul style="list-style-type: none"> <li>- No littering by workers shall be allowed.</li> <li>- All litter on and around the site must be picked up and placed in the bins provided.</li> <li>- The site should be always kept tidy and free of litter. All domestic and general waste produced daily should be cleaned and contained daily.</li> <li>- No solid waste landfill will be established at the site.</li> <li>- No waste shall be burned or buried anywhere unless permitted to do so.</li> <li>- Waste shall be collected and shall be removed regularly to avoid bad odours.</li> <li>- Hazardous and non-hazardous waste shall be always stored separately.</li> </ul> |
| <b>Environmental contamination from liquid waste</b>                 | <ul style="list-style-type: none"> <li>- Hydrocarbon and chemical-contaminated solids must be stored correctly and disposed of by registered companies.</li> <li>- Safe disposal certificates must be kept and provided to the site manager on request.</li> </ul>  |
| <b>Sewage and grey water from temporary portable toilets on site</b> | <ul style="list-style-type: none"> <li>- Portable toilets such as portable camping units, must be provided during construction.</li> <li>- Discharging of the portable units are to be conducted at an existing suitable facility.</li> <li>- These will be emptied and maintained regularly by the contractor.</li> </ul>  |

The Project shall have a dedicated waste collection, sorting and pickup area. This area will be fenced off, clearly signposted and access shall be by those authorised.

The following information shall be provided in this section:

- Location plan of the dedicated area;
- Arrangements to appropriately secure and designate the area (fencing, locked gate);
- Access arrangements;
- Drainage arrangements;

- Set up of the site;
- Authorised personnel; and
- Any rules or codes of conduct.

#### 10.4 WASTE GENERATED

List all waste streams, type and quantity, allowing a review to be undertaken and the most appropriate waste disposal options are identified. Table 9 provides an example of how this can be managed.

**Table 9 - Waste type and management**

| Waste type            | Estimated quantity  | Waste management   | Waste carrier information and site |
|-----------------------|---|--|------------------------------------|
| Vegetation            | ( <b>Example only</b> ) 1 small Thorn tree<br>Other bushes and vegetation | Recover, store and replant thorn tree<br>Other bushes etc. give away to community or compost   |                                    |
| Packaging and plastic | ( <b>Example only</b> ) 3 cubic meters                                    | Take to an approved and permitted landfill site  | Company Name:<br>Phone No:         |
| Extracted material    | ( <b>Example only</b> ) 100 m <sup>3</sup>                                | Contour along riverbank, flatten and rake to mould in with environment, in an area where minimum smothering of other vegetation occurs |                                    |

## **11 DECOMMISSIONING AND REINSTATEMENT**

The upgrade of the fuel railway line will take place within the existing fuel railway servitude, and the transport of materials and machinery to the site will only occur on existing roadways and within the railway servitude.

The area disturbed within the railway servitude will be rehabilitated once construction activities have been completed. The DEO / ER and IECO will take photographs of the railway servitude and of the contractor's office/camp before either area has been disturbed. The DEO / ER and IECO will specify precisely how the land is to be rehabilitated at the end of the construction so that it is returned to a similar condition as prior to the bridge construction, repair and strengthening. The rehabilitation work will include removal of all equipment and waste and levelling the disturbed ground to a smooth contoured surface condition so as to be in a similar state as to when it was found.

## **12 REGISTER OF ENVIRONMENTAL RISKS AND ISSUES**

### 12.1 INTRODUCTION AND KEY RISKS

An environmental review of the proposed Project has been completed to identify all the commitments and agreements made within the environmental scoping report for the amended portions of the Project. From this, a schedule of environmental commitments and risks has been produced, which details deliverables including measures identified for the prevention of pollution or damage to the environment during the construction phase. Monitoring criteria to be adhered are listed under the specific monitoring plan and/or programme.

It has been evaluated that all risks associated with the fuel railway line upgrade are low to minor. All mitigation measures have been incorporated into this EMP.

## 13 IMPLEMENTATION OF THE EMP

This EMP:

- A. Has been prepared pursuant to a contract with the Proponent;
- B. Has been prepared on the basis of information provided to ECC up to November 2022;
- C. Is for the sole use of the proponent, for the sole purpose of an EMP;
- D. Must not be used (1) by any person other than the proponent or (2) for a purpose other than an EMP; and
- E. Must not be copied without the prior written permission of ECC.

ECC has prepared the EMP on the basis of information provided by the Proponent and the environmental scoping report for the amended Walvis Bay fuel railway line upgrade Project.



## **ANNEX A (1): CONSTRUCTION MONTHLY INSPECTION REPORT**

INSPECTION DATE: \_\_\_\_\_

INSPECTION COMPLETED BY: \_\_\_\_\_

SUMMARY OF CONSTRUCTION ACTIVITIES OCCURRING:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CONTRACTORS ON SITE:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

| CONSTRUCTION |                               |   |                |   |   |
|--------------|-------------------------------|---|----------------|---|---|
| Ref No.      | Item                          | Requirements  | Responsibility | Compliant   | Notes / Action Taken / Corrective Action Required |
| 1            | - Development of access roads | <ul style="list-style-type: none"> <li>- Use existing tracks as much as possible.</li> <li>- Route new tracks around established and protected trees, and clumps of vegetation</li> <li>- Identify important tree species (protected species) and mark with red/white tape to clearly highlight to construction workers</li> <li>- Remove invasive species</li> <li>- Visually check the area prior to undertaking construction works</li> <li>- Relocate slow moving reptiles and amphibians away from the construction area</li> <li>- No driving off designated access routes (into the bush) / off-road driving</li> <li>- Speed restrictions applied</li> <li>- Avoid natural drainage lines</li> <li>- Install any erosion control measures to avoid surface run off during the wet season</li> </ul> | Contractor     | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/><br><input type="checkbox"/> |   |

| <b>CONSTRUCTION</b> |  |  |                       |  |  |
|---------------------|--|--|-----------------------|--|--|
| <b>Ref No.</b>      | <b>Item</b>  | <b>Requirements</b>  | <b>Responsibility</b> | <b>Compliant</b>   | <b>Notes / Action Taken / Corrective Action Required</b> |
| 2                   | Establishment and Management of Construction working areas | <ul style="list-style-type: none"> <li>- Bring plant and equipment as and when required.</li> <li>- Suitable siting of construction office, waste collection area, and storage area for plant and equipment.</li> <li>- Downward lighting.</li> <li>- Application of good housekeeping.</li> <li>- No snares or catching of animals for pets or food.</li> <li>- Mitigation of environmental impacts and aspected in accordance with EMP and Method Statements.</li> </ul> | Contractor            | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A<br><input type="checkbox"/> |  |
| 3                   | Removal of vegetation in servitudes and camp site areas    | <ul style="list-style-type: none"> <li>- Identify important tree species (protected species) and mark with red/white tape to clearly highlight to construction workers, prior to vegetation removal</li> <li>- Any trees felled, to be used in accordance with the permit</li> <li>- No animals or birds may be collected, caught, consumed or removed from site by the Contractor or personnel on site.</li> </ul>  | Contractor            | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A<br><input type="checkbox"/> |  |

| <b>CONSTRUCTION</b> |  |  |                       |  |  |
|---------------------|--|--|-----------------------|--|--|
| <b>Ref No.</b>      | <b>Item</b>                                    | <b>Requirements</b>  | <b>Responsibility</b> | <b>Compliant</b>   | <b>Notes / Action Taken / Corrective Action Required</b> |
|                     |  | <ul style="list-style-type: none"> <li>- Catch and release slow moving reptiles and amphibians, move at least 50m from the site.</li> <li>- Clear only enough vegetation to meet the purpose intended.</li> <li>- Remove any invasive or alien species along the route.</li> <li>- Identify and mark some large individuals of Acacia erioloba and Combretum imberbe trees where they are present and make sure they are protected.</li> <li>- Check working area prior to construction works commencing daily.</li> <li>- Avoid disturbing geological features and rocky areas.</li> <li>- Mitigation of environmental impacts and aspect in accordance with EMP and Method Statements</li> </ul> |                       |  |  |
| 4                   | Ground excavation and trenching or foundations | <ul style="list-style-type: none"> <li>- Contractor to oversee all ground excavation works.</li> <li>- Daily inspection of open trench for reptiles. Must be removed to a safe location and not killed or harmed.</li> </ul>   | Contractor            | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A<br><input type="checkbox"/> |  |

| CONSTRUCTION |  |  |   |   |   |
|--------------|--|--|---|---|---|
| Ref No.      | Item   | Requirements   | Responsibility  | Compliant   | Notes / Action Taken / Corrective Action Required |
|              |  | <ul style="list-style-type: none"> <li>- Ensure members of team are trained in safe snake handling or appoint a trained snake handler for the project (this can be a trained worker)</li> <li>- In the event of a heritage discovery, works to cease until advice from specialist is obtained. A permit from the National Heritage Council will be required to relocate remains.</li> <li>- Minimise stockpiling and specific works during high winds</li> </ul>   |   |   |   |
| 5            | General construction activities: Generation of waste | <ul style="list-style-type: none"> <li>- Application of Waste Management Plan.</li> <li>- Waste to be collected, separated and stored in appropriately marked areas / containers (e.g. wood, metals, building rubble, garden waste, domestic waste).</li> <li>- Waste storage areas shall display appropriate signage, be well maintained and good housekeeping will be applied.</li> <li>- Waste will be disposed of to designated and appropriate facilities, which will be identified in the Waste Management Plan.</li> <li>- Site induction and training of staff.</li> </ul> | <ul style="list-style-type: none"> <li>- Contractor</li> <li>- DEO</li> </ul> | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/><br><input type="checkbox"/> |   |

| CONSTRUCTION |  |  |                |  |   |
|--------------|--|--|----------------|--|---|
| Ref No.      | Item   | Requirements   | Responsibility | Compliant  | Notes / Action Taken / Corrective Action Required |
| 6            | Operating plant and equipment  | <ul style="list-style-type: none"> <li>- Avoid idling of plant and equipment (turn off when not in use)</li> <li>- Minimise the multiple use of noisy plant and equipment.</li> <li>- Vehicles to be in good working order and well maintained and serviced in accordance with specific requirements.</li> <li>- Notice to surrounding community of when noisy activities are to be undertaken.</li> <li>- Site Induction</li> </ul>           | Contractor     | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A<br><input type="checkbox"/> |   |
| 7            | Use and maintenance of plant and equipment: Spills of fuels, oils or chemicals | <ul style="list-style-type: none"> <li>- Spill kits in designated areas around site.</li> <li>- Contain and clean up a spill in accordance with emergency procedures.</li> <li>- Report spill as soon as possible.</li> <li>- All plants and materials are to be well maintained and have appropriate containment (drip trays).</li> <li>- Site Induction and appropriate training of nominated persons to contain/clean up spills.</li> </ul> | Contractor     | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A<br><input type="checkbox"/> |   |

| CONSTRUCTION |   |   |                |   |   |
|--------------|---|---|----------------|---|---|
| Ref No.      | Item  | Requirements  | Responsibility | Compliant   | Notes / Action Taken / Corrective Action Required |
|              |   | <ul style="list-style-type: none"> <li>- Suitable PPE and equipment when handling hazardous chemicals, liquids and materials.</li> <li>- Storage of vehicles away from the area where the aquifer / shallow groundwater is located</li> </ul>   |                |   |   |
| 8            | General construction activities: Energy use   | <ul style="list-style-type: none"> <li>- Turn off plant and equipment when not in use.</li> <li>- Regular maintenance of plant and equipment.</li> <li>- Minimise/optimize workforce travel.</li> <li>- Source sustainable material where possible. Apply waste hierarchy and reuse and recycle.</li> </ul> | Contractor     | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |   |
| 9            | General construction activities: Material use | <ul style="list-style-type: none"> <li>- Source materials locally to reduce transportation.</li> <li>- Source sustainable material where possible.</li> <li>- Apply waste hierarchy and reuse and recycle. material where possible</li> </ul>   | Contractor     | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |   |
| 10           | Vehicle movements on site                     | <ul style="list-style-type: none"> <li>- Speed limit of 40km/hr.</li> <li>- Site induction and training of staff.</li> <li>- Reversing of vehicles overseen with appropriate warnings (lights/sounds).</li> </ul>   | Contractor     | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |   |

| <b>CONSTRUCTION</b> |                                  |   |                       |  |  |
|---------------------|----------------------------------|---|-----------------------|--|--|
| <b>Ref No.</b>      | <b>Item</b>                      | <b>Requirements</b>   | <b>Responsibility</b> | <b>Compliant</b>   | <b>Notes / Action Taken / Corrective Action Required</b> |
| 11                  | General construction activities: | <ul style="list-style-type: none"> <li>- The Contractor's vehicles, materials and employees must never venture or operate within 50m of the heritage monuments. Should a grave be unearthed the PM should contact the appropriate authorities who will advise what to do</li> </ul> | Contractor            | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A<br><input type="checkbox"/> |  |





## **ANNEX A (2): CONSTRUCTION MONTHLY COMPLIANCE REPORT**

INSPECTION DATE: \_\_\_\_\_

INSPECTION COMPLETED BY: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

SUMMARY OF CONSTRUCTION ACTIVITIES OCCURRING:

CONTRACTORS ON SITE:

**NON-CONFORMANCE**

AREA OF ACTIVITY:

REASON:

RESPONSIBLE PARTY:

CORRECTIVE ACTION TAKEN:

FOLLOW-UP ACTION TO BE TAKEN:

ADDITIONAL COMMENTS:

**GOOD PERFORMANCE**

*Description of activity or action in which contract went beyond compliance towards responsible care for the environment:*

**ADDITIONAL COMMENTS**



## **ANNEX A (3): MAINTENANCE MONTHLY INSPECTION REPORT**

INSPECTION DATE: \_\_\_\_\_

INSPECTION COMPLETED BY: \_\_\_\_\_

SUMMARY OF MAINTENANCE ACTIVITIES OCCURRING:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CONTRACTORS ON SITE:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_




| <b>OPERATIONS: MAINTENANCE</b> |   |   |                       |   |  |
|--------------------------------|---|---|-----------------------|---|--|
| <b>Ref No.</b>                 | <b>Item</b>   | <b>Requirements</b>   | <b>Responsibility</b> | <b>Compliant</b>  | <b>Notes / Action Taken / Corrective Action Required</b> |
| 12                             | Construction and campsite environmental condition                     | <ul style="list-style-type: none"> <li>- Regular monitoring: Identify and mark some large individuals of Acacia erioloba and Combretum imberbe trees where they are present and make sure they are protected. Use them as an indicator of environmental/aquifer well-being in the area.</li> <li>- Regular communication with the community.</li> </ul> | Contractor and DEO    | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |  |
| 13                             | Increase in population in the area/community activities               | <ul style="list-style-type: none"> <li>- Borehole/aquifer protection measures to be implemented</li> <li>- Educating local communities</li> </ul>   | Contractor and DEO    |   |  |
| 14                             | Monthly checks and maintenance activities: Use of plant and equipment | <ul style="list-style-type: none"> <li>- Spill kits in designated areas around the site.</li> <li>- Contain and clean up any spills by emergency procedures.</li> <li>- All plants and materials are to be well maintained and have appropriate containment (drip trays).</li> </ul>  | Contractor            | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |  |



**Environmental management plan for the upgrade of Walvis Bay fuel line**

Bigen Infrastructure Services Namibia (Pty) Ltd on behalf of the Ministry of Works and Transport

| <b>OPERATIONS: MAINTENANCE</b> |  |   |                       |   |  |
|--------------------------------|--|---|-----------------------|---|--|
| <b>Ref No.</b>                 | <b>Item</b>  | <b>Requirements</b>   | <b>Responsibility</b> | <b>Compliant</b>  | <b>Notes / Action Taken / Corrective Action Required</b> |
|                                |  | <ul style="list-style-type: none"> <li>- Major maintenance activities of plant and equipment shall be undertaken off-site.</li> <li>- Site Induction and appropriate training of nominated persons.</li> <li>- Suitable PPE and equipment when handling hazardous chemicals, liquids and materials.</li> </ul>                  |                       |   |  |
| 15                             | Monthly checks and maintenance activities: Generation of waste | <ul style="list-style-type: none"> <li>- Application of Waste Management Plan.</li> <li>- Waste to be collected and separated</li> <li>- Waste will be disposed of at designated and appropriate facilities, which will be identified in the Waste Management Plan.</li> </ul>  | Contractor and DEO    | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |  |
| 16                             | Maintenance of swathe within the servitude                     | <ul style="list-style-type: none"> <li>- Visually check the area before undertaking maintenance works</li> <li>- Relocate slow moving reptiles and amphibians away from the cleared area</li> <li>- No driving off designated access routes (into the bush) / off-road driving</li> <li>- Speed restrictions applied</li> </ul> | Contractor            | Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |  |

## ANNEX B: PROTECTED / IMPORTANT TREES

| Scientific name             | Protection status | Image  |
|-----------------------------|-------------------|--|
| <i>Adenia Pechuelii</i>     |                   |    |
| <i>Cyphostemma Currorii</i> |                   |   |
| <i>Cyphostemma Uter</i>     |                   |  |

| Scientific name                | Protection status | Image   |
|--------------------------------|-------------------|---|
| <i>Erythrina Decora</i>        |                   |   |
| <i>Sesmaothamnus leistneri</i> |                   |  |