UPDATED ENVIRONMENTAL MANAGEMENT PLAN

Renewal of Environmental Clearance Certificate for TradePort Namibia's Current Import-Export Trading Operations of Mineral Ore and other Commodities Utilizing the Trans-Oranje Corridor via the Port of Lüderitz, Namibia

MARCH 13

Compiled for: TradePort Namibia (Pty) Ltd
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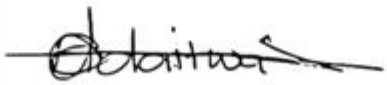
Tradeport Namibia
Logistics Specialist

report details

DOCUMENT INFORMATION AND APPROVAL		
Title	Application for Renewal and Amendment of Environmental Clearance Certificate for TradePort Namibia's Import-Export Trading Operations of Mineral Ore (Manganese and Iron) and other Commodities Utilizing the Trans-Oranje Corridor via the Port of Lüderitz, Namibia	
ECC Application Reference number	APP-001098	
Location	Lüderitz Port, Namibia	
Proponent	TradePort Namibia (Pty) Ltd P. O. Box 22458 Windhoek Namibia, 9000	
Author:	Signature	Date
Mr. Shadrack Tjiramba (EAP) 1		14 March 2023
Approval - Client 1		
Mr. Tate Nande Ndaitwa		15 March 2023

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ECC – 00952 Serial: uSWNcV952

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental Management Act (Act No. 7 of 2007)

TO

TradePort Namibia (Pty) Ltd
P. O. Box 72458, Windhoek

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

Proposed Import-Export Trading Operations of Mineral Ore (Manganese and Iron) and other Commodities Utilizing the Trans-Oranje Corridor via the Port of Lüderitz, //Karas Region

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM
Private Bag 13306
WINDHOEK NAMIBIA
19 MAY 2021
ENVIRONMENTAL COMMISSIONER
REPUBLIC OF NAMIBIA

ENVIRONMENTAL COMMISSIONER

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executive summary

Project Overview

TradePort Namibia (Pty) Ltd (herein referred to as the proponent) is a registered Namibian company, which ventures in the Import and Export Trade Operations that mainly entails the transportation, handling and storage of fuel and mineral ore. In 2019, TradePort Namibia obtained an Environmental Clearance Certificate for its current Import and Export Trading operations for of upto 80 000 tons of Manganese ore and other commodities (Gypsum, Diesel, Fertilizer and Lime) along the Trans-Oranje Corridor through Lüderitz Port.

An amendment to incorporate the Import-Export of Iron ore and the installation and operation of a Transshipment Loading facility were conducted and granted on 19 May 2021. Subsequently, the relevant compliance Audit was also conducted and the report submitted accordingly to the Ministry of Environment, Forestry and Tourism.

In particular to this assignment with Enviro-Leap Environmental Consulting, TradePort Namibia (Pty) Ltd intends to ensure compliance with its environmental obligation relating to the Environmental Management Plan and ECC's conditions. Therefore, it appointed Enviro-Leap on the 02nd March 2023 to update it Envrionemntal Management Plan and compile a submission to the Department of Environmental Affairs and Forestry for the renewal of its Environmental Clearance Certificate that is due to expire in May 2023.

Process Approach

In this instance the, an environmental Audit has to be undertaken to assess whether the TradePort Namibia's operation were undertaken in compliance with the ECC Conditions: The specific objectives of this report is therefore to:

- Review the initial environmental assessment documents (including ECC Conditions) in order to identify the potential impacts that require mitigation and compliance.
- Review the previous Audit report and environmental obligations (including ECC Conditions) in order to evaluate compliance with set EMP and ECC obligations
- Compile an Environmental Audit report (for the outstanding reporting terms i.e. July – December 2021 and January – June 2022) for submission to the regulatory authority.

The audit was conducted adopting a desktop study, which entailed a detailed review of the company's available environmental compliance documents and analysis of data from its monitoring programs.

Overall Recommendation

Overall, with an 89 % compliance rate Enviro-Leap Consulting is confident to provide a positive recommendation and in favor of the renewal of the TradePort Namibia's when its environmental clearance certificate by the Department of Environmental Affairs and Forestry (DEAF) accordingly harnessed to increase the net marginal benefits relating to the socio-economic aspects of the operations.

However, with minor non-compliance recorded it is advised that the proponent attend to the recommendation provided on page 34 with urgency.

glossary

CBD	Central Business District
CA	Competent Authority
DEAF	National Department of Environmental Affairs and Forestry
EA	Environmental Authorization
ECC	Environmental Clearance Certificate
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
FTU	Floating Transfer Unit
GPS	Geographical Positioning System
GPS	Geographical Positioning System
OEC	Office of Environmental Commissioner
PM10	Particulate Matter 10
PPP	Public Participation Process

1. PROJECT OVERVIEW

This section provides an overview of the conceptual operational design and an overview of the sites and technology selection process for the proposed construction of two warehouse facilities at Ariamsvlei and Lüderitz for TradePort Namibia's import and export operations mineral ore and fuel commodity (***Figure 1***, illustrates the proposed trading operation's process flow).

Figure 1: Illustration of TradePort Namibia's activity flow, detailing the initial activities at the mines in South Africa to the loading of the commodity onto the ship at the Lüderitz Port in Namibia

The operational specific activities are conducted within closed warehouse facilities both at Ariamsvlei (these includes offloading and bulk storage of the various mineral commodity (*currently only Manganese and Iron Ore*)) and the Lüderitz Port (activities here includes the off-loading and bulk storage of the various fuel and mineral commodity, as well as loading the mineral onto the ship for export).

The commodities for which the environmental clearance certificate was obtained includes both Fuel and Mineral ore (Manganese, Iron (amendment application submitted), Gypsum, Lime, Fertilizer, and Petrol or diesel) will be imported from South Africa. Overall, three major activity components are undertaken by TradePort Namibia under the current authorisation and these are:

- Component 1; the construction of two warehouse facilities, one at Ariamsvlei and Lüderitz – all were constructed mainly within existing infrastructure footprint of TransNamib and NamPort respectively.
- Component 2; the installation of a floating transfer unit (FTU) for the introduction of transshipment operation at the Port of Lüderitz – to ensure that the proponent will be to load at full capacity.
- Component 3; the handling within closed environment and haulage of commodities by use of a combined Rail-and-Road means of transportation of the commodities from the source locations in South Africa and Namibia, and the export by sea (vessels).

Figure 2: *The Trans-Oranje rail and road corridor showing the key TradePort Namibia proposed import and export operational sites: Ariamsvlei (1), Lüderitz Concrete Slab (2) and Lüderitz Port (3) (Source: Risk-Based Solutions, 2019)*

2.1. SITE SELECTION

The haulage route through town and to the port area is surrounded by mixed land-use within both Ariamsvlei Settlement and Lüderitz Town. The route follows the existing railway and is intended to eliminate any potential implications on traffic within the two towns as it's transported to the warehouses. Along the way, the route passes initially through some residential areas to the right and some partially dormant semi-industrial on the left of the railway, and mixed use Lüderitz CBD consisting of various institutions, residential properties, tourist accommodation, restaurants and various business.

On a site specific level, two sites (one each) at the Ariamsvlei and at the Port of Lüderitz were selected, on which the warehouse facilities were constructed (corner GPS coordinates presented in Table 3) and operations currently undertaken. The sites selection process took into consideration key site selection factors such as land availability, proximity to sensitive receptors, site accessibility, topography, risks, current land use.

Additionally, a site with the harbour was identified for the proposed operation of a Floating Transshipment / Barge facility were to be installed and operated and for which a separate Environmental Clearance Certificate was obtained. However, due to the declining global economy emanating from the Corvid-19 pandemic and recently the Russia-Ukraine conflict, this particular component of the operations has not commenced.

Table 1: Corner coordinates of the proposed development site

Corner point	Latitude	Longitude
A – Ariamsvlei Warehouse	-28.119220° S	19.838435° E
B – Lüderitz Warehouse	-26.641372° S	15.153275° E
C – Lüderitz Barge Facility	-26.640786° S	15.152960° E

Table 2: *Technical details of the proposed facility as required by the Competent Authority*

Component		Description / Dimensions	
		Ariamsvlei	Lüderitz Port
Height of Warehouse facility		9,5 meter	9,5 meter
Areas of Warehouse facility		426 m2	426 m2
Area occupied by buildings		XXX	XXX
Volume (tons) of Fuel & Mineral exported Monthly	Manganese	100 000 ton	100 000 ton
	Iron (Planned)	90 000 ton	90 000 ton
	Lime	–	5000 ton
	Fertiliser	180 000 ton	180 000 ton
	Others	10 000 ton	10 000 ton
Power Requirements		1.5 Kw	1.5 Kw
Water Requirements		500 liters	500 liters
Size and number of vessels		Ultra and Supramax, 2 per Month	Ultra and Supramax, 2 per Month
Size and number of rail wagons		2.4m x 17m, 17 ton Tare, 61 ton Load, 200 oF	2.4m x 17m, 17 ton Tare, 61 ton Load, 200 oF
Height of fencing		3 meter	3 meter
Type of fencing		Barbwire	Barbwire

2.2. KEY COMPONENTS OF TRADEPORT NAMIBIA'S OPERATIONS

The following is the summary of the activities for which the environmental clearance certificate was issued, and which takes into considerations the characteristics of the materials to be handled by the proponent and the sensitivity of the receiving environment at Ariamsvlei and Lüderitz Port areas as well as the need to build closed up warehouses:

- In South Africa: Road trucks will be loaded with sieved and dust treated manganese lumpy ore and other materials such as gypsum, fertiliser and lime in Northern Cape TradePort Namibia - South Africa. Diesel in bond (handled in Tank-tainers) will likely be transported by rail to and from South Africa;

- At Ariamsvlei: No dusty generation materials such as manganese ore shall be stockpiled in the open at this location. A closed-up warehouse was constructed in consultation with T

- TransNamib and the Ariamsvlei Village Settlement Committee or //Karas Regional Council. The entire open area to be used is paved in order to minimises wind-blown dust and dust generation from vehicles movements. Only products in containers or bags are stored / stockpiled and handled at the storage facility Ariamsvlei;

- Lüderitz Port Area: Iron and Manganese handling (Figure 3), and other commodities such as gypsum, fertiliser, fuel and lime is undertaken and handled inside a fully enclosed warehouse constructed inside the port area. Iron and or Manganese ore is sieved at the mine and the lumpy ore treated not to generate dust during handling. Only products in containers or bags are stored / stockpiled and handled outside an enclosure within the Port area and all operation is undertaken in line with NamPort and TransNamib operational requirements and handling procedures.

2.2. PROJECT DEVELOPMENT ACTIVITIES

2.2.1. Employment

Across board an approximate total of 307 employments were maintained and about 15 expected to be created during the implementation of the Ausnek Bulk Fuel Storage Facility, these constitute the number of people employed directly by TradePort and its service providers (contractors).

Table 3: Number of jobs created through TradePort Operations		
Sections	Directly	Indirectly
TradePort Warehouses	40	–
NamPort Terminal	–	32
Stevedores WBS	–	20
NCA /CCS/LBS Clearing	–	14
Elegant Auto	–	13
Workers Fright	–	2
Alfrid Knights	–	12
Transporters	174	0
Bulk Fuel Storage at Aus	5	10
Total employments	219	103

In addition to having created employments opportunities, TradePort Namibia embarked on corporate social responsibility initiatives of sponsoring community project or organisation that provide crucial service for the benefit of the larger public such as listed in Table 4 below.

Table 4: List of beneficiaries of TradePort's SCR		
Beneficiary	Description of Items	Value
Karasburg Primary School	Bought Tissues and sanitary wipes	N$ 8697.50
Kharas Regional Council	Lüderitz Support Issuance ID	N$ 7540.00
Nampol – Lüderitz	8 Tyres for traffic patrol vehicles	N$ 11483.23
Ariamsvlei Police Station	Service Parts for patrol vehicles	N$ 2227.20
Lüderitz Town Council	Helping Hand Old Age Home	N$ 11799.99
Lüderitz Town Council	Coffin for Lüderitz resident funeral	N$ 16188.00
Ariamsvlei Soccer Team	Purchase of Soccer Kits (Balls etc.)	N$ 8801.00
	Total employments	N$ 66736.92.00

2.2.2. *Operation and Maintenance*

The TradePort Namibia's key operational activities revolves around the handling of the commodity in closed-top container / within warehouse facilities at both Ariamsvlei and Lüderitz Port (Figure 3), and haulage by Truck or Rail (Figure 4). When ship arrives trucks linked trailers runs for 24 hours per day until ship is fully loaded, with each truck carrying skips that are used to load the commodity directly into the ship with ships gear.

Figure 3: Illustration of TradePort's commodity container storage at the Port of Luderitz

Figure 4: Illustration of TradePort's commodity container handling both at the Rail Stations and within the Port

2.2.3. *Proposed new supporting development*

The construction activities are proposed at the TransNamib Ausnek Depot about 2 km east of Aus Settlement, and is expected to extend over a period of between three and six months concurrently for the respective sites (see *Table 4* for technical specifications of the respective warehouse facilities). These assumes that normal daylight working hours shall be are adhered to in respect to the Labour Act provisions.

Table 4: *Technical details of the proposed facility as required by the Competent Authority*

Component	Description / Dimensions
	TransNamib Ausneck Depot, Aus
Height of storage facility	2,6 meter
Areas of storage facility	350 m²
Area occupied by buildings	25 m²
Volume of Fuel Stored Monthly	249 cubic meters
Power Requirements	< 1 Kw
Water Requirements	20 cubic meters (during construction only)
Size of Delivery tankers	20 cubic meters
Size of individual Tanks (x 3)	83 cubic meters

The construction specific activities will involve the transportation of personnel, construction material and equipment to the site, and personnel away from the site. In terms of site establishment, laydown areas will be required at the outset of the construction phase, as well as dedicated access routes from the laydown areas to the working areas.

Haul roads for construction traffic (for the delivery of concrete, paving materials and other construction materials) will be required. All needed construction material (different sand and stone aggregate, cement etc.…) will be sourced from local suppliers, and most preferable from Keetmanshoop. Both Water and Electricity will be needed both for domestic and construction purpose during the construction phase. However, during the operation phase, even lesser water and energy will be required as the operations does not involve any process or manufacturing activities.

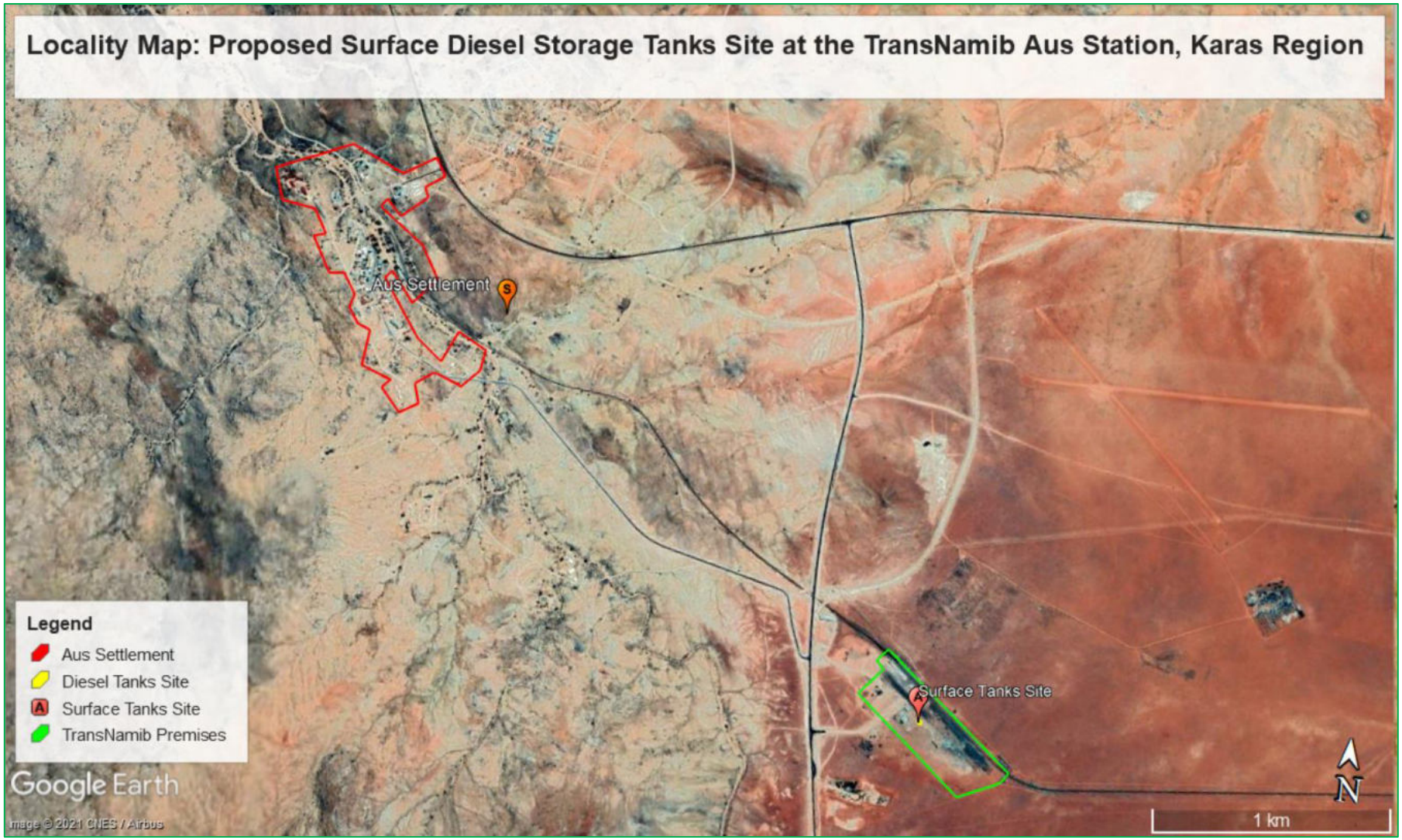

Figure 6: *The proposed Bulk Fuel Storage Facility at Ausneck, within the TransNamib premises at Aus*

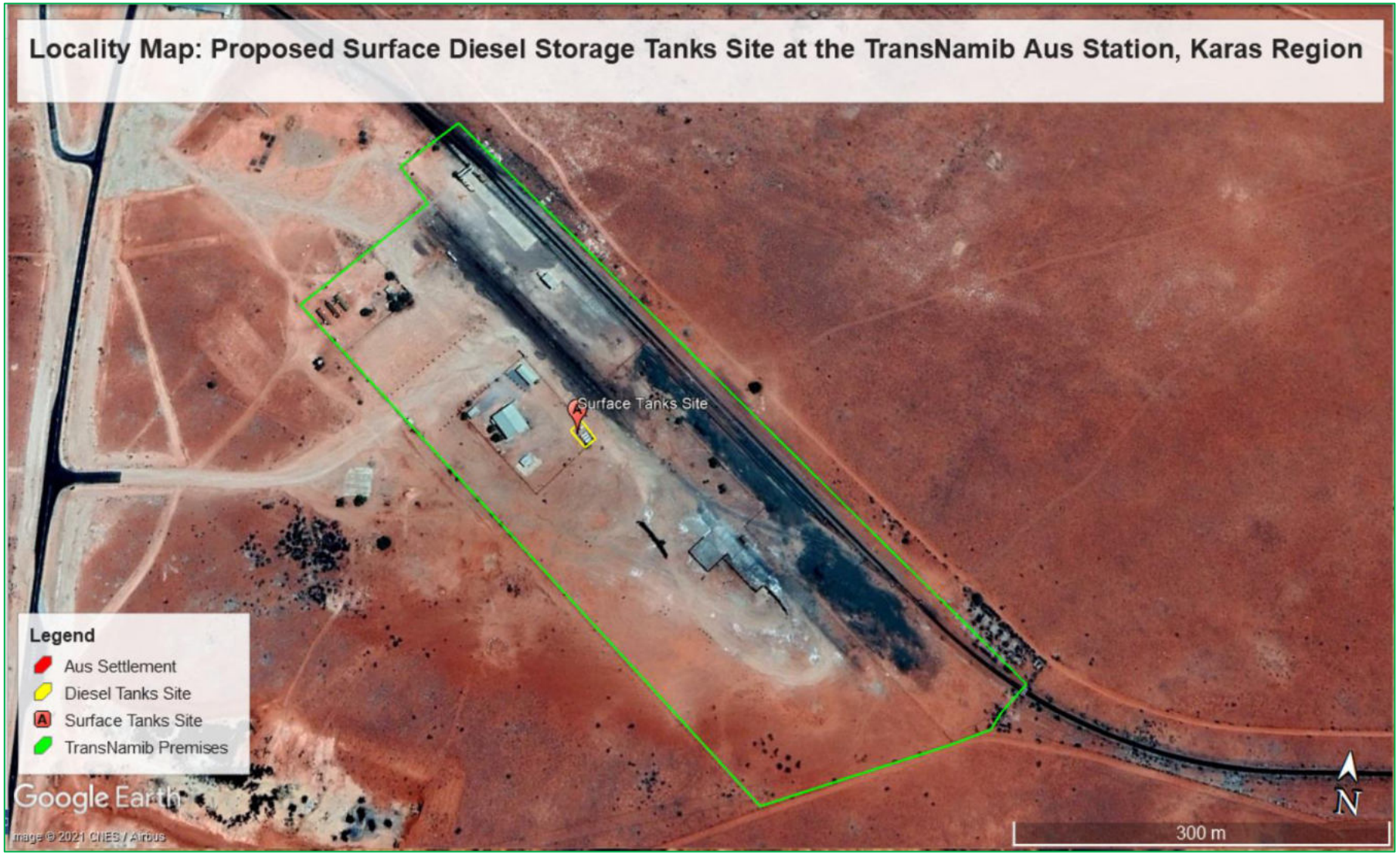

Figure 7: *The Detailed illustration of the Bulk Fuel Storage Facility at Ausneck, within the TransNamib premises*

2. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 OVERALL OBJECTIVES OF THE EMP

The following overall environmental objectives have been set for the IPMMs and Partners small-scale quarrying project:

- To comply with national legislation and standards for the protection of the environment.
- To limit potential impacts on biodiversity through the minimisation of the footprint (as far as practically possible) and the conservation of residual habitat within the mine area.
- To keep surrounding communities informed of farming activities through the implementation of forums for communication and constructive dialogue.
- To ensure the legal and appropriate management and disposal of general and hazardous waste, through the implementation of a strategy for the minimisation, recycling, management, temporary storage and removal of waste.
- To develop, implement and manage monitoring systems to ensure good environmental performance in respect of the following: ground and surface water, air quality, noise and vibration, biodiversity and rehabilitation.

4.2 METHODS OF IMPACT SCOPING / ASSESSMENT

Potential environmental impacts were identified through both desktop literature review and consultation with I&APs, regulatory authorities, specialist and Enviro-Leap Consulting. In case of social impacts, the assessment focused on third parties only (third parties include members of the public and other local and regional institutions) and did not assess health and safety impacts on workers because the assumption was made that these aspects are separately regulated by health and safety legislation, policies and standards.

The impacts are discussed under issue headings in this section. The discussion and impact assessment for each sub-section covers the construction, operational, decommissioning and closure phases where relevant. This is indicated in the table at the beginning of each sub-section. Included in the table is a list of project activities/infrastructure that could cause the potential impact per farming phase. The activities/infrastructure that are summarized in this chapter, link to the description of the proposed project (see Section 6 of the EIA report).

Mitigation measures to address the identified impacts are discussed in this section and in most cases (unless otherwise stated), these mitigation measures have been taken into account in the assessment of the significance of the mitigated impacts only.

Both the criteria used to assess the impacts and the method of determining the significance of the impacts is outlined in **Table 5**. This method complies with the method provided in the Namibian EIA Policy document and the draft EIA regulations. Part A provides the approach for determining impact consequence (combining severity, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D. Both mitigated and unmitigated scenarios are considered for each impact.

Table 5: Criteria for Assessing Impacts

		PART A: DEFINITION AND CRITERIA
Definition of SIGNIFICANCE		**Significance = consequence probability**
Definition of CONSEQUENCE		**Consequence is a function of severity, spatial extent and duration**
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will oftenbe violated. Vigorous community action. Irreplaceable loss of resources.
	M	Moderate/measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints. Noticeable loss of resources.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/will remain in the current range. Recommended level will never be violated. Sporadic complaints. Limited loss of resources.
	L+	Minor improvement. Change not measurable/will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favorable publicity.
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short-term
	M	Reversible overtime. Life of the project. Medium-term
	H	Permanent beyond closure – Long-term.
Criteria for ranking the SPATIAL SCALE of Impacts	L	Localized-Within the site boundary.
	M	Fairly widespread–Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/national

PART B: DETERMINING CONSEQUENCE

SEVERITY = L

DURATION	Long-term	**H**	Medium	Medium	Medium
	Medium term	**M**	Low	Low	Medium
	Short-term	**L**	Low	Low	Medium

SEVERITY = M

DURATION	Long-term	**H**	Medium	High	High
	Medium term	**M**	Medium	Medium	High
	Short-term	**L**	Low	Medium	Medium

SEVERITY = H

DURATION	Long-term	**H**	High	High	High
	Medium term	**M**	Medium	Medium	High
	Short-term	**L**	Medium	Medium	High
			L	M	H
			Localized Within site boundary Site	Fairly widespread Beyond site boundary	Widespread Far beyond site boundary
				SPATIAL SCALE	

	PART C: DETERMINING SIGNIFICANCE				
PROBABILITY (of exposure to impacts)	Definite/Continuous	**H**	Medium	Medium	High
	Possible/frequent	**M**	Medium	Medium	High
	Unlikely/seldom	**L**	Low	Low	Medium
			L	M	H
				CONSEQUENCE	

PART D: INTERPRETATION OF SIGNIFICANCE	
Significance	**Decision guideline**
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

*H = high, M = medium and L = low and + denotes a positive impact.

3. SUMMARY OF ENVIRONMENTAL IMPACT S AND THE MANAGEMENT PLAN

3.1 STAKEHOLDER MANAGEMENT AND MITIGATION

It is important that channels of communication are maintained over the life of the project for surrounding landowners, the general public members, as well as the local and traditional authorities, table 6 shows the stakeholders communication Management and Mitigation Plan.

Table 6: Actions relating to stakeholder communication

Issue	Management commitment	Phase
Understanding who the stakeholders are	Maintain and update the claim holders stakeholder register, including stakeholders' needs and expectations. Ensure that all relevant stakeholder groups are included.	**All**
	A representative database would include government, employees, service providers, contractors, indigenous populations, local communities, traditional authorities, NGOs, shareholders, customers, the investment sector, community-based organizations, suppliers and the media.	**All**
	Ensure that marginalized and vulnerable groups are also considered in the stakeholder communication process.	**All**
	Record partnerships as well as their roles, responsibilities, capacity and contribution to development.	**All**
Liaising with interested and affected parties at all phases in the mine life	Devise and implement a stakeholder communication and engagement strategy.	**All**
Responsibility		

3.2 IIMPACTS ON THE BIOPHYSICAL ENVIRONMENT

Table 7. Impact on the Terrestrial Ecology

Impact Event	Disturbances to the terrestrial ecology including livestock and wildlife
Description	The Warehouse storage facilities shall be located in build-up environments, and within an industrial land-use zone and with little to no significant ecological sensitivity. However, the railway line earmarked for transportation of the commodity runs through parts of the country with a variety of land use zonation including farms, town and national parks. While the use of the rail transport does not present direct impacts, secondary impacts may be associated with the handling and haulage of iron and manganese ore.
Nature	Impacts in the terrestrial environment as a result of the project could result from the following: • Generation of dust contaminating the environment • Secondary impacts such as Fauna and Flora Poaching • Train – animal (Wild / Livestock) collisions, where the railway passes through farms and national parks. • Lighting impacts on Bird flying at night

Phases: Phases during which sources of terrestrial ecology impacts apply are highlighted below; Significance assessment was carried out on the operational phase which presents a long term risk.						
Construction Phase	Operational Phase		Decommissioning Phase		Post Closure	
N/A	• Transportation of commodities by rail • Handling of wagons / containers at the Port		N/A		N/A	
Severity	Taken together, the disturbances will have a high severity in the unmitigated scenario. In the mitigated scenario, many of these disturbances can be prevented or mitigated to acceptable levels, which reduces the severity to low.					
Duration	The Significance of the potential impacts is subject to the proposed operation's life-time, however duration is short-term.					
Spatial Scale	Low, localized although the affected environment extend the length of the transportation route					
Probability	Very Low, most impact are contained by the buffer fence (rail reserve) on either side of the rai-line					
Unmitigated	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
	M	M	M	H	M	H
Mitigated	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
	L	L	M	L	L	M
Conceptual Description of Mitigation Measures	The consideration and choice of transporting the mineral and fuel commodity on rail instead of road, offers a great opportunity for significantly preventing potential secondary impacts relating to trucks-animal-collision, potential spills / contamination of soil and groundwater during road accident incidents. Hence, it is advisable that the proposed is implemented with strict use of the identified rail transport route and mode.					

Table 8. Impact on the Marine Ecology

Impact Event	Disturbances to the marine ecology including the fish stock and other marine-life
Description	Impacts in respect to Marine Ecology relates manly to Accidental spillage or leakage of oil, fuel, or contamination of sea water with ore and thus affecting the chemical or biological oxygen demand (COD or BOD, respectively). Dissolved particulate matters as a result handling both the Iron and Manganese ore may lead in diminished oxygen levels in seawater which forces mobile fauna to flee while sessile and sediment-dwelling organisms die. When oxygen is no more available for the break-down of discharged matter, other microbial communities take over, leading to emissions of sulphide.
Nature	The effects of both Iron and Manganese on the immune response in the studied animals vary, they are all affected in some way. Overall, while certain dose levels of Iron and Manganese doses are essential to human and plants, access dose-levels are toxic. Manganese is abundant in soft ocean bottoms, but since it is normally bound to the sediments it usually does not cause any ill effects. However, hypoxia releases the manganese from the sediments, making it a threat to the health of marine species.

<table>
<tr><td colspan="7">Phases: Phases during which sources of marine ecology impacts apply are highlighted below; Significance assessment was carried out on the operational phase which presents a long term risk.</td></tr>
<tr><td>Construction Phase</td><td colspan="2">Operational Phase</td><td>Decommissioning Phase</td><td colspan="3">Post Closure</td></tr>
<tr><td>N/A</td><td colspan="2">• Transportation of commodities by rail
• Handling of wagons / containers at the Port</td><td>N/A</td><td colspan="3">N/A</td></tr>
<tr><td>Severity</td><td colspan="6">In the unmitigated scenario, the potential risk for sea water contamination is high particularly if the commodity handling activities do not employ adequate dust suppression mitigation measures. However, in the mitigated scenario, most dust particulate particles may be well contained by both treating the ore at source and ensuring continuous dust management during the loading of ore on-board the ship.</td></tr>
<tr><td>Duration</td><td colspan="6">The Significance of the potential impacts is subject to the proposed operation's life-time, however duration is short-term.</td></tr>
<tr><td>Spatial Scale</td><td colspan="6">Low, localized although the affected environment extend the length of the transportation route</td></tr>
<tr><td>Probability</td><td colspan="6">Very Low, most impact are contained by the buffer fence (rail reserve) on either side of the rai-line</td></tr>
<tr><td rowspan="2">Unmitigated</td><td>Severity</td><td>Duration</td><td>Spatial Scale</td><td>Consequence</td><td>Probability of Occurrence</td><td>Significance</td></tr>
<tr><td>M</td><td>M</td><td>M</td><td>H</td><td>M</td><td>H</td></tr>
<tr><td rowspan="2">Mitigated</td><td>Severity</td><td>Duration</td><td>Spatial Scale</td><td>Consequence</td><td>Probability of Occurrence</td><td>Significance</td></tr>
<tr><td>L</td><td>L</td><td>M</td><td>L</td><td>L</td><td>M</td></tr>
<tr><td>Conceptual Description of Mitigation Measures</td><td colspan="6">The most practical measure is containment of dust by storage and handling of mineral commodities in closed warehouse, and ensuring that maintenance of dust suppression equipment remains to date. In events of accidental spillage, oxidation followed by filtration may be applied in small water bodies when combined levels of iron and manganese exceed 10 mg/L.

In this process, a chemical is added to convert any dissolved iron and manganese into the solid, oxidized forms that can then be easily filtered from the water. Although it might be effective for larger water bodies, the cost of doing so warrants strict compliance with the avoidance / prevention measures.</td></tr>
</table>

3.3 IMPACTS ON THE SOCIO-ECONOMIC ENVIRONMENT

Table 9. Impact on the Health and Safety

Impact Event	Disturbances to the human receptors including pets and other household animals					
Description	Trace amounts of Iron and Manganese are essential to the health of human, wildlife and plants. However, these has a tendency to accumulate in some organisms and plants which could lead to higher levels presenting potentially harmful exposures further up the food chain. It is not considered likely that Iron / Manganese pollution has any effects on the global environment.					
Nature	Both Iron and Manganese compounds can enter the body by either inhalation of air containing particulate matters, ingestion of water or food containing these compounds. Inhalation of air containing high levels of these compounds can lead to a range of adverse health effects. These include hallucinations, changes in behavior, weakness, speech problems headaches, tremors, stiffness, balance problems and bronchitis.					
Phases: Phases during which sources of Health and Safety impacts apply are highlighted below; Significance assessment was carried out on the operational phase which presents a long term risk.						
Construction Phase	Operational Phase		Decommissioning Phase		Post Closure	
N/A	• Transportation of commodities by rail • Handling of wagons / containers at the Port		N/A		N/A	
Severity	The cumulative impact emanating from TradePort Namibia's operations and other operator shall be of high severity in the unmitigated scenario. In the mitigated scenario, many of these disturbances can be prevented or mitigated to acceptable levels, which reduces the severity to low.					
Duration	The Significance of the potential impacts is subject to the proposed operation's life-time, with potentially long-term impacts extending beyond the project operations in the unmitigated scenario.					
Spatial Scale	Low, localized and mainly limited to the warehouse sites in Lüderitz and Keetmanshoop					
Probability	Very Low, most impact are contained through the preferred handling, storage and transportation methods of the commodities involved.					
Unmitigated	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
	H	H	M	H	M	H
Mitigated	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
	L	L	M	L	L	M
Conceptual Description of Mitigation Measures	In the unmitigated scenario, the greatest risk in respect to the proposed operations would entail mainly airborne exposure to dust particles generated during the handling activities. Hence, the most appropriate measures would be to enforce exposure limits through strict work-shifts and ensuring maximum dust suppression measures. Critically, in the mitigated scenario which entails adoption of precautionary measures as identified in the EMP including the avoidance approach of the mitigation hierarchy i.e. ensure a no dust operations.					

Table 10. Impact on the Traffic and Noise

Impact Event	Disturbances to the social and economic aspects of the town population					
Description	Container handling related activities may result in temporary noise producing activities. Some noise will exist due to the train and other heavy motor vehicles accessing the port and moving through town for commodity delivery as well as the operations of front-end loaders and forklifts.					
Nature	Temporary to long-term impact are anticipated, but these shall not be entirely or significantly influence by the proposed activity but from regular TransNamib and NamPort operational activities. For rail transport minor traffic impacts are expected and is limited to a number or rail level crossings along the rail route. Noise will be the major negative impact on both residents and the tourism sector, especially at accommodation establishments situated along or near the proposed transport route through Namibia and the town.					
Phases: Phases during which sources of terrestrial ecology impacts apply are highlighted below; Significance assessment was carried out on the operational phase which presents a long term risk.						
Construction Phase	Operational Phase		Decommissioning Phase		Post Closure	
N/A	• Transportation of commodities by rail • Handling of wagons / containers at the Port		N/A		N/A	
Severity	Potential impacts will not, be associated directly to activities of TradePort Namibia's operations and therefore, in this respect and across-board and scenarios the severity will be very low					
Duration	The Significance of the potential impacts is subject to the proposed operation's life-time, however duration is short-term.					
Spatial Scale	Low, localized although the affected environment extend the length of the transportation route					
Probability	Very Low, most impact are contained by the buffer fence (rail reserve) on either side of the rai-line					
Unmitigated	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
	L	L	H	M	L	H
Mitigated	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
	L	L	L	L	L	L
Conceptual Description of Mitigation Measures	Conceptual discussion of the mitigation measures is provided below and detailed in the EMP. It is recommended that project activities relating to handling and transportation must adhere strictly to both the routes assessed, use or rail transportation only and handling of the iron or manganese commodity in closed containers. In a case of a contingency operation which my trigger deviation of actions from the approved mitigation measures, approval must be obtained from all relevant competent authorities prior to deviation with the approved condition.					

Table 11. Impact on the Economic Aspect

Impact Event	Disturbances to the social and economic aspects of the town population					
Description	Potential economic gains that may never be realized if the proposed project activities does not go-ahead include: loss in income for both TransNamib and NamPort, unemployment and the loss of socio-economic benefits derived from current and future export and import trading opportunities.					
Nature	Impacts relating to the of the local socio-economic activities may arise from increased TransNamib and NamPort operational activities in relation to the export of mineral and fuel commodity through Lüderitz resulting in employment (positively) and noise (potential negative on residence and tourism).					
Phases: Phases during which sources of terrestrial ecology impacts apply are highlighted below; Significance assessment was carried out on the operational phase which presents a long term risk.						
Construction Phase	Operational Phase		Decommissioning Phase		Post Closure	
N/A	• Transportation of commodities by rail • Handling of wagons / containers at the Port		N/A		N/A	
Severity	In the unmitigated scenario, this implies in the case where the activity take not take effect, no economic benefits shall realize hence, the severity in respect to unemployment shall be very high. However, with the implementation of the proposed operations, the severity of unemployment shall be reduced to medium.					
Duration	The Significance of the potential impacts is subject to the proposed operation's life-time, with a long-term potential					
Spatial Scale	Low, localized and only limited to the two towns (Lüderitz and Keetmanshoop)					
Probability	Medium to High probability in respect to job creation on both the temporary during construction phase of warehouse facilities and long-term during operation phase					
Unmitigated	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
	H	L	L	L	L	L
Mitigated	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
	L	M+	M+	H+	H+	H+
Conceptual Description of Mitigation Measures	It is critical that timely and continuous communication and dissemination of information with the local community is ensured to alleviate potential sense of social marginalization, drive gender equality and enhance the understanding and perception of the benefits associated with TradePort Namibia's operations					