

APP-002039

ENVIRONMENTAL IMPACT ASSESSMENT

**PROPOSED NEW ACCESS ROADS ON NEW PORTIONS 220 &
193 OF THE REMAINDER OF FARM AUSSENKEHR NO.147
AND THE SUBDIVISION OF THE REMAINDER OF FARM
AUSSENKEHR NO.147 INTO PORTION 201 AND REMAINDER**

//KHARAS REGION



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August 2020

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AUSSENKEHR FARMS (PTY) LTD

EXECUTIVE SUMMARY

An Environmental Impact Assessment (EIA) has been commissioned by Aussenkehr Farms (Pty) Ltd, for the proposed construction and operations of new access roads on portions 193 and 220; and the subdivision of Remainder of farm Aussenkehr No. 147 into portion 201, in Aussenkehr, //Kharas Region.

Considering the nature of the proposed development and its activities, the EIA has been undertaken in accordance with the requirements of existing national legislations, of which the National Environmental Assessment Policy (1995), the Environmental Management Act (2007) and its regulations of 2012, and other relevant legislations and regulations pertaining to Environmental Assessments and protection of the environment in the Republic of Namibia are considered most important. Some existing international policies are also taken into account and are used as guidelines.

Impacts identified from baseline studies, site visits and stakeholder consultation process have been assessed making use of a comprehensive assessment methodology as provided by the Department of Environmental Affairs (DEA) of Namibia. This included looking at impact significance through, its nature, extent, duration, probability and intensity. Major issues or impacts identified are soil, surface and ground water impacts; air quality (including dust pollution); ecological impacts; risk of fires and explosions; hygiene and health impact; heritage impacts; generation of waste; traffic safety, especially during construction; noise pollution; safety and security; and cumulative impacts.

These impacts are assessed in each of the three stages of project development namely, construction, operation and decommissioning phases.

Socio-economic impacts amongst others include creation of part-time and permanent employment opportunities and economic spin-offs for the local businesses and suppliers. Waste generation during the construction activities is eminent; however implementation of proper management strategies should address these issues.

Cumulative impacts expected as a result of the proposed access roads and subdivision include, dust and exhaust emissions from vehicles frequenting the sites during all phases of the development, coupled with the existing emissions from vehicles in the surrounding areas, the air quality will be impacted.

According to a flood line analysis report of the Aussenkehr settlement conducted in 2018, the project sites do not fall within the 1 in 100 year floodline.

In general, impacts are expected to be low to medium, mostly short lived and site specific. Mitigation options recommended in the Environmental Management Plan (EMP) will guide and ensure that the impacts of the construction work are minimised. All environmental risks can be minimised and managed through implementation of preventative measures and sound management systems. Environmental audits should be carried out to ensure compliance of the EMP and environmental regulations of Namibia.



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List of Abbreviations

EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMA	Environmental Management Act
EMS	Environmental Management System
ESA	Environmental Scoping Assessment
I&Aps	Interested and Affected Parties
PPPPs	Projects, Plans, Programmes and Policies
LRP	Lead Replacement Petrol
ULP	Unleaded Petrol
SANS	South African National Standards

PROJECT DETAILS

TEAM MEMBERS

NAME	POSITION	COMPANY
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REPORT STATUS: **FINAL**

CLEARANCE ISSUED TO

:

Please note that the environmental certificate should be made out to the proponent:

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GLOSSARY OF TERMS

Project area - Refers to the entire study area encompassing the total area as indicated on the study area map.

Project site - Refers to the geographical setting (piece of land) on which the proposed development is to be located.

Assessment - The process of collecting, organising, analysing, interpreting and communicating information relevant to decision making.

Alternatives - A possible course of action, in place of another, that would meet the same purpose and need but which would avoid or minimize negative impacts or enhance project benefits. These can include alternative locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The “no-go” alternative constitutes the ‘without project’ option and provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid undesirable negative impacts.

Cumulative Impacts - in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Evaluation – means the process of ascertaining the relative importance or significance of information, the light of people’s values, preference and judgements in order to make a decision.

Environment – Is the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life. As defined in the Environmental Policy and Environmental Management Bill of Namibia - *“land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values”*.

Environmental Impact Assessment (EIA) – process of assessment of the effects of a development on the environment.

Environmental Management Plan (EMP) - A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by several responsible parties throughout the duration of the proposed project.

Hazard - Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant; that is, it would present the same hazard wherever it was present.

Interested and Affected Party (I&AP) - any person, group of persons or organization interested in or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.

Proponent (Applicant) – means a person who intends or undertakes a project, policy, programme or plan.



Significant Impact - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Environmental Clearance Certificate - This Certificate obtained from the Ministry of Environment and Tourism (Directorate of Environmental Affairs) approving the EIA study and providing clearance to the proponent to initiate work.

Environmental Assessment Practitioner - A person designated by a proponent to manage the assessment process.

Local Authority - Means a local authority council as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992).



1. BACKGROUND AND INTRODUCTION

Aussenkehr Farms (Pty) Ltd has commissioned an Environmental Impact Assessment (EIA) for the proposed construction and operations of new access roads on portions 193 and 220; and the subdivision of Remainder of farm Aussenkehr No. 147 into portion 201, in Aussenkehr, //Kharas Region. See Figure 1.

Portions 193 and 220 are already utilised as access roads to various residential and commercial properties at the settlement. Portion 201 on the other hand, is occupied by existing development consisting of residential and business properties. The proponent intends to formalise and incorporate the proposed land uses of these portions into the new town layout plan of the settlement

Matrix Consulting Services was appointed to undertake the Environmental Impact Assessment in order to obtain an Environmental Clearance Certificate (ECC) for the intended development in Aussenkehr. This study will enable decision makers to make an informed decision regarding the development and make sure it does not have significant impacts on the environment and that they are mitigated. The environmental impact assessment was conducted to comply with Namibia's Environmental Assessment Policy and the Environmental Management Act.

1.1. *Project Rationale*

Over time, Aussenkehr has evolved into a large settlement accommodating workers employed in nearby areas. The current population is estimated at 6,000 permanent workers on the farms, with this number increasing to around 30,000 farm workers during peak seasons.

Aussenkehr is currently in the process of formalising the settlement and preparing town layouts for approval with the relevant authority (NAMPAB). As a result, the need to formalise and incorporate portions 193, 220 and 201 into the layout plans rose.

Potential spin-offs:

- ❖ **Employment:** The creation of temporary new jobs is expected during the construction phase of the development. It is estimated that the new jobs will improve the livelihoods of the new workers and their families.
- ❖ **Skills development:** As the construction and operation of the development requires specialised work and skills it can be expected that experts will be training locals in certain skills during development and operation.
- ❖ **Contribution to economic development** (e.g. supply of materials and goods for construction purposes; new businesses, employment etc.).
- ❖ **General enhancement of the quality of life** in Aussenkehr and the surrounding areas, especially the immediate businesses and residences accessed by portions 193 and 220.



2. TERMS OF REFERENCE

Aussenkehr Farms (Pty) Ltd intends to develop new access roads on portions 193 and 220; and subdivide remainder of farm Aussenkehr No. 147 into portion 201, in Aussenkehr. Matrix Consulting Services was appointed to undertake the Environmental Impact Assessment of the proposed development.

This study will enable decision makers to make an informed decision regarding the development and make sure it does not have significant impacts and that they are mitigated. The environmental impact assessment was conducted to comply with the Environmental Assessment Policy (1995) and the Environmental Management Act (2007) and its regulations of 2012.

3. ENVIRONMENTAL STUDY REQUIREMENTS

According to the Environmental Management Act no. 7 of 2007, the proponent requires an environmental clearance from the Ministry of Environment and Tourism (Department of Environmental Affairs) for the proposed development. The certificate means that the Ministry of Environment and Tourism is satisfied that the activity in question will not have an unduly negative impact on the environment. It may set conditions for the activity to prevent or to minimise harmful impacts on the environment.

The proposed development is listed as a project requiring an environmental assessment as per the following listed activities in the environmental Management Act no 7 of 2007 and its Guidelines (06 February 2012):

Table 1. List of activities identified in the EIA Regulations that apply to the proposed project

Activity Description:	Description of Activity	Activities
Activity 8.9 Water Resource Developments	The construction and other activities within a catchment area.	The project entails activities that will be undertaken within a catchment area.
Activity 10.1 (a) (Infrastructure)	The construction of – Oil, water, gas and petrochemical and other bulk supply pipelines.	The proposed project includes the installation of bulk municipal services
Activity 10.1 (b) (Infrastructure)	The construction of – Public roads.	The proposed project includes the construction of roads.
Activity 10.2 (a) (Infrastructure)	The route determination of roads and design of associated physical infrastructure where – it is a public road;	The proposed project includes the construction of roads.

4. DESCRIPTION OF ALTERNATIVES

4.1 *No-Go Alternative*

The no-go alternative provides the baseline for the assessment of the intended development. Consequently, the no-go alternative assumes that the activity does not



go ahead; implying a continuation of the current situation or status quo whereby the settlement continues to have informal land use and limited services.

The development will contribute to a better quality of life for the residents, improved traffic flow, social mobility, and an infrastructure that will accommodate future growth with a minimum of complications. The No-development option is thus not considered to be a feasible alternative at this stage.

4.2 Site Alternative

The site is located within an area, which is generally suitable for this type of operation. The environmental footprint is expected to be minimal as the development is situated in an urban setting, which is already disturbed and earmarked for development. All potential impacts emanating from the proposed development at the project location, both environmental and socio-economic, are of such a nature that they can be mitigated through good practice and compliance to the EMP.

5. SCOPE

The scope of the EIA aims at identifying and evaluating potential environmental impacts emanating from the construction, operations and possible decommissioning of the proposed development. Relevant data have been compiled by making use of secondary sources and from project site visits. Potential environmental impacts and associated social impacts will be identified and addressed in this report.

The environmental impact assessment report aims to address the following:

- a) Identification of potential positive and negative environmental impacts.
- b) Provide sufficient information to determine if the proposed project will result in significant adverse impacts.
- c) Identification of “hotspots” which should be avoided where possible due to the significance of impacts.
- d) Evaluation of the nature and extent of potential environmental impacts
- e) Identify a range of management actions which could mitigate the potential adverse impacts to required levels.
- f) Provide sufficient information to the Ministry of Environment to make an informed decision regarding the proposed project.
- g) Conduct a public participation exercise.
- h) Present and incorporate comments made by stakeholders.



6. METHODOLOGY

The following methods were used to investigate the potential impacts on the social and natural environment due to the construction and operation of the development:

- a) Information about the site and its surroundings was obtained from existing secondary information and site visits.
- b) Interested and affected Parties (I&APs) were consulted and their views, comments and opinions are presented in this report.

7. STATUTORY REQUIREMENTS

The EIA process is undertaken in terms of Namibia's Environmental Management act no. 7 of 2007 and the Environmental Assessment Policy of 1995, which stipulates activities that may have significant impacts on the environment. Listed activities require the authorisation from the Ministry of Environment and Tourism (DEA). Section 32 of the Environmental Management Act requires that an application for an environmental clearance certificate be made for the listed activities. The following environmental legislation is relevant to this project:

I. The Namibian Constitution

The Namibian Constitution has a section on principles of state policy. These principles cannot be enforced by the courts in the same way as other sections of the Constitution. But they are intended to guide the Government in making laws which can be enforced.

The Constitution clearly indicates that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.

II. Environmental Management Act No.7 of 2007

This Act provides a list of projects requiring an Environmental assessment. It aims to promote the sustainable management of the environment and the use of natural resources and to provide for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.

The Act defines the term "*environment*" as an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.

The Environmental Management Act has three main purposes:



- (a) to make sure that people consider the impact of activities on the environment carefully and in good time
- (b) to make sure that all interested or affected people have a chance to participate in environmental assessments
- (c) to make sure that the findings of environmental assessments are considered before any decisions are made about activities which might affect the environment.

Line Ministry: Ministry of Environment and Tourism

III. The Water Act (Act No 54 of 1956)

The Water Act No. 54 of 1956 as amended, aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users.

The Act broadly controls the use and conservation of water for domestic, agricultural, urban and industrial purposes; to control, in certain respects, the use of sea water; to control certain activities on or in water in certain areas; and to control activities which may alter the natural occurrence of certain types of atmospheric precipitation.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

IV. Water Resources Management Act of Namibia (2004) (Guideline only)

This act repealed the existing South African Water Act No.54 of 1956 which was used by Namibia. This Act ensures that Namibia's water resources are managed, developed, protected, conserved and used in ways which are consistent with fundamental principles depicted in section 3 of this Act. Part IX regulates the control and protection of groundwater resources. Part XI, titled Water Pollution Control, regulates discharge of effluent by permit.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

V. Environmental Assessment Policy of Namibia (1995)

Environmental Assessments (EA's) seek to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT (in the context of IEM and EA's) is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.

All listed policies, programmes and projects, whether initiated by the government or the private sector, should be subjected to the established EA procedure as set out in Figure 2.

Line Ministry: Ministry of Environment and Tourism



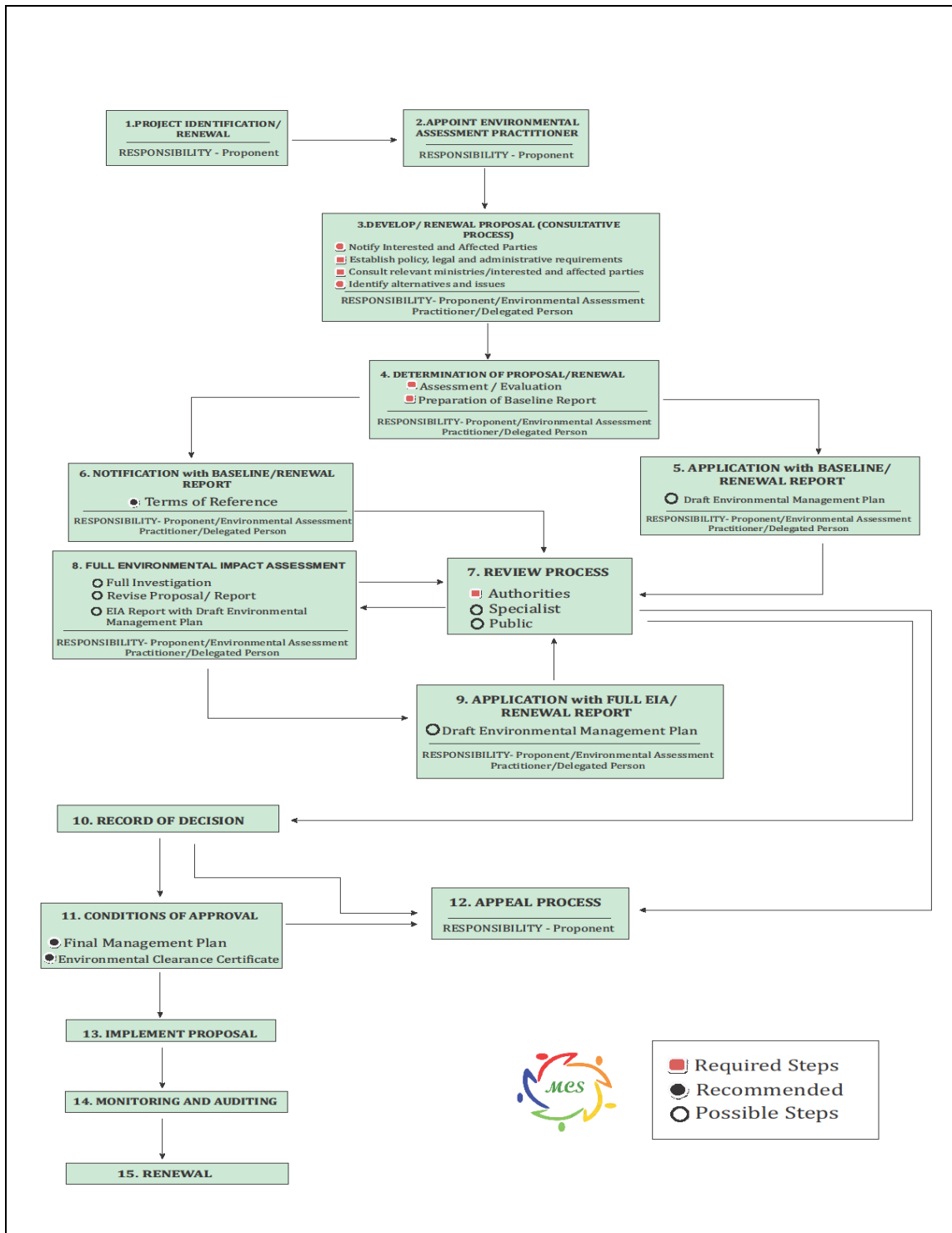


Figure 1. Environmental Assessment Procedure of Namibia (Adapted from the Environmental Assessment Policy of 1995)

Apart from the requirements of the Environmental Assessment Policy, the following sustainability principles need to be taken into consideration, particularly to achieve proper waste management and pollution control:

✓ **Cradle to Grave Responsibility**

This principle provides that those who manufacture potentially harmful products should be liable for their safe production, use and disposal and that those who initiate potentially polluting activities should be liable for their commissioning, operation and decommissioning.

✓ **Precautionary Principle**

There are numerous versions of the precautionary principle. At its simplest it provides that if there is any doubt about the effects of a potentially polluting activity, a cautious approach should be adopted.

✓ **The Polluter Pays Principle**

A person who generates waste or causes pollution should, in theory, pay the full costs of its treatment or of the harm, which it causes to the environment.

✓ **Public Participation and Access to Information**

In the context of environmental management, citizens should have access to information and the right to participate in decisions making.

VI. The Draft Wetland Policy (1993)

Requires that any wetlands and its associated hydrological functions form a part, to be managed in such a way that their biodiversity, vital ecological functions and life support systems are protected for the benefit of present and future generations.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

VII. Draft Pollution Control and Waste Management Bill (Guideline only)

The proposed development in Aussenkehr, only applies to Parts 2 and 8 of the Bill.

Part 2 stipulates that no person shall discharge or cause to be discharged any pollutant to the air from a process except under and in accordance with the provisions of an air pollution licence issued under section 23. It further provides for procedures to be followed in licence application, fees to be paid and required terms of conditions for air pollution licences.

Part 8 calls for emergency preparedness by the person handling hazardous substances, through emergency response plans.

Line Ministry: Ministry of Environment and Tourism



VIII. Atmospheric Pollution Prevention Ordinance of Namibia (No. 11 of 1976)

The Ordinance prohibits anyone from carrying on a scheduled process without a registration certificate in a controlled area. A certificate must be issued if it can be demonstrated that the best practical means are being adopted for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process. Best practice would be to notify the line Ministry about emissions but it is not a legal requirement.

Line Ministry: Ministry of Health and Social Services

IX. Hazardous Substances Ordinance No. 14 of 1974

The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.

Line Ministry: Ministry of Health and Social Services

X. Forestry Act (No.12 of 2001)

This Act makes provision for the protection various plant species. Harvesting permits are required from the Directorate of Forestry to clear certain protected vegetation species from the site.

Line Ministry: Ministry of Environment and Tourism

XI. Local Authorities Act

In terms of the Local Authorities Act, the proposed development of Swakopmund will be registered with the office of the Deeds. In addition, it is then the responsibility of the Local Authority to provide the developed business erven with services such as water, electricity, sewer reticulation as well as roads. By doing so, the Local Authority will then acquire funds through rates and taxes from these properties in order to maintain and upgrade the municipal services.

Ministry of Regional and Local Government, Housing and Rural Development

XII. Sewerage and Drainage Regulations (amendments) Local authorities act, section 23 (1992).

The regulations make provision for proper construction of pipelines in drainage lines. The regulations also stipulate the prevention of pollution and environmental damage caused by improper construction of sewerage and water pipelines in drainage lines.



XIII. Soil Conservation Act (No.76 of 1969).

The Act advocates for the Prevention and combating of soil erosion, conservation, improvement and manner of use of soil and vegetation, and protection of water resources.

Line Ministry: Ministry of Environment and Tourism

8. PROJECT DESCRIPTION

The proposed development will entail the following activities:

- Construction of access roads on Portions 193 and 220.
- Subdivision of Remainder of farm Aussenkehr No. 147 into Portion 201.

See Figure 3 for site layout map.

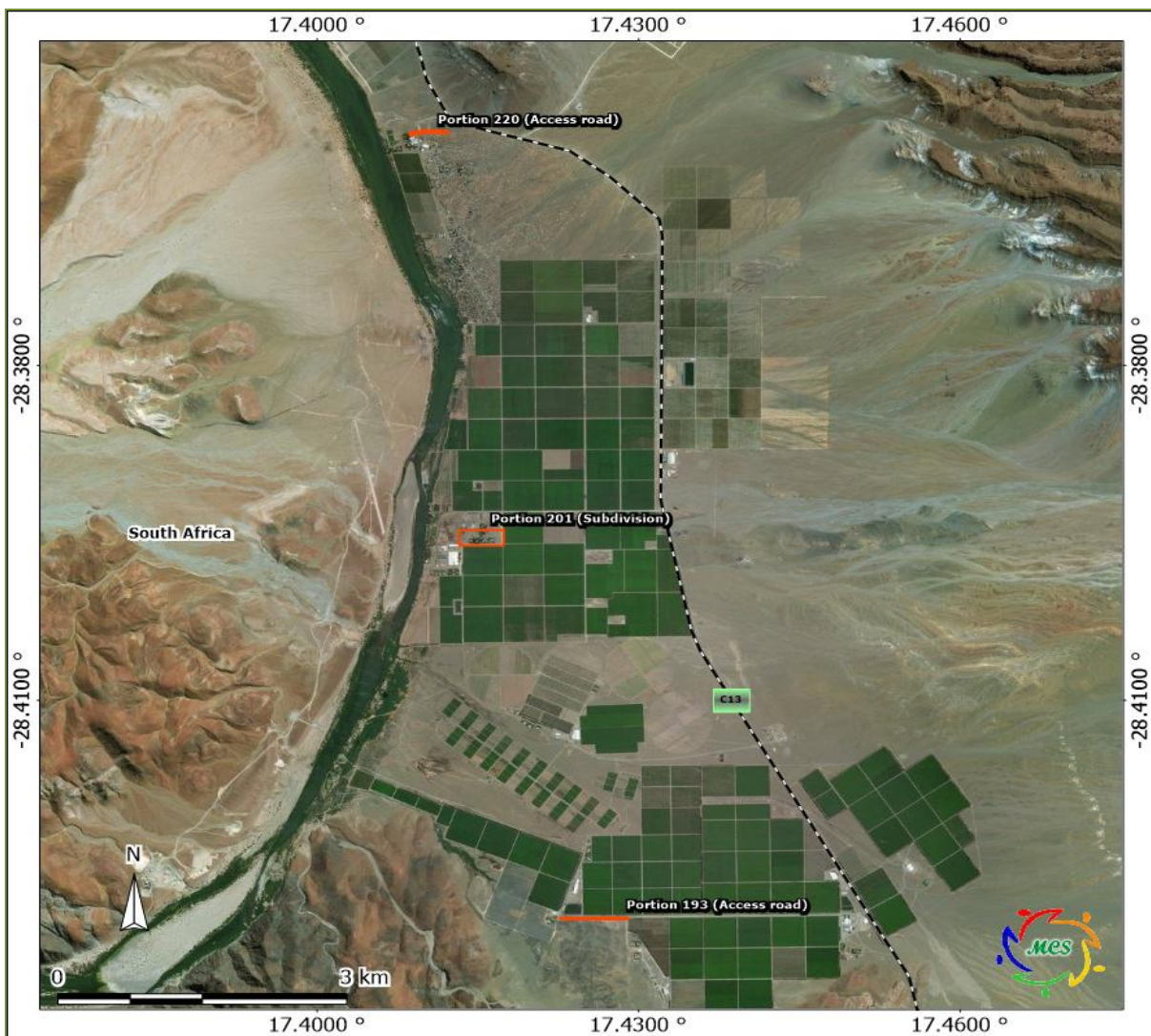


Figure 2. Proposed site layout



9. GENERAL ENVIRONMENT OF THE STUDY AREA

This section lists the most important environmental characteristics of the study area and provides a statement on the potential environmental impacts on each.

9.1 Location and Land Use

The study area is situated on Remainder of farm Aussenkehr No. 147 into portion 201, in Aussenkehr, //Kharas Region. See Figure 3.

- Portion 193 (28.42956°S; 17.42579°E)
- Portion 220 (28.35897°S; 17.40967°E)
- Portion 201 (28.39536°S; 17.41560°E)

Aussenkehr is a large agricultural settlement on the banks of the Orange River in the south of Namibia. The settlement falls within the Karasburg Constituency of the //Kharas Region and is situated approximately 24km northwest of Noordoewer

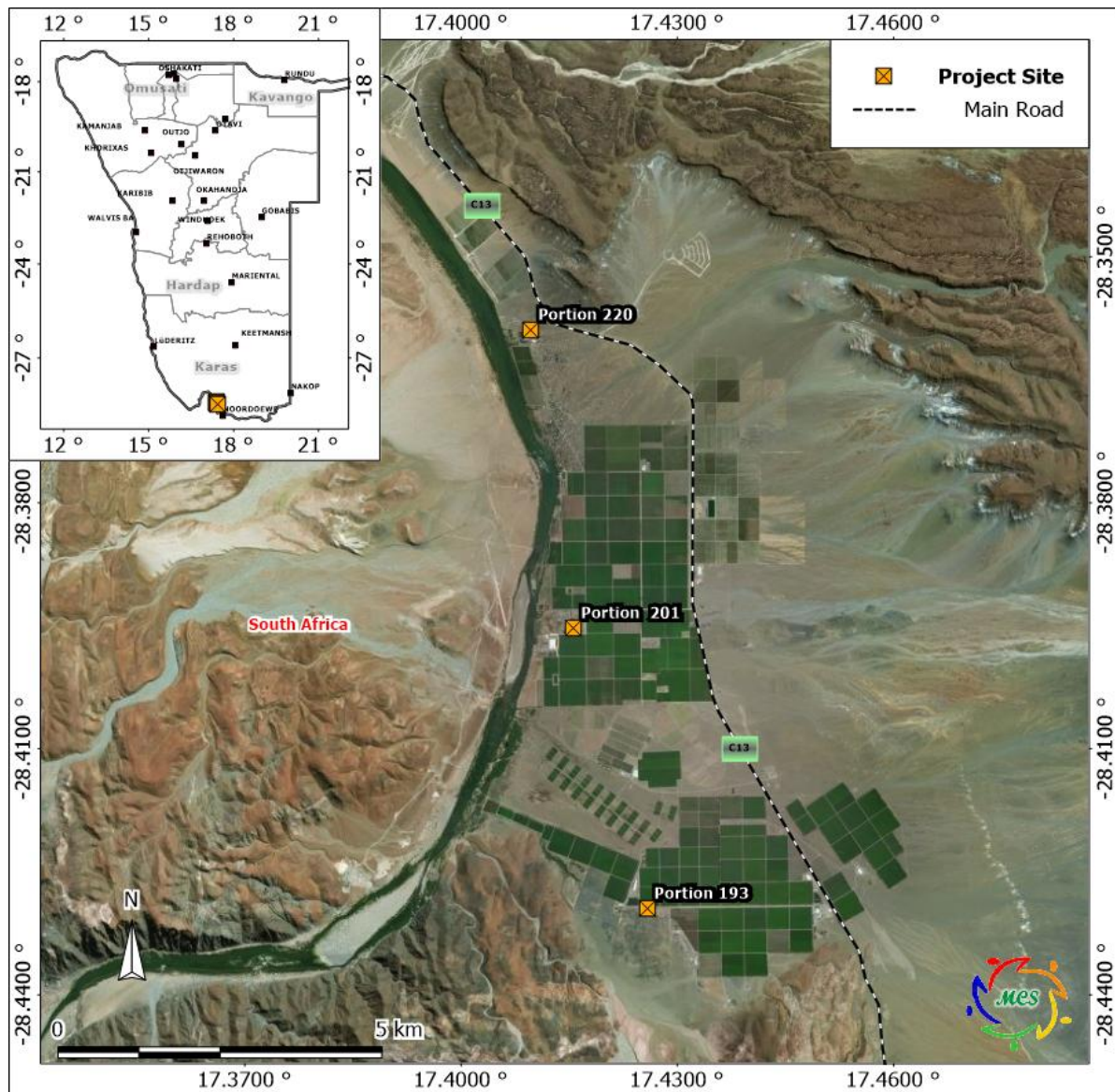


Figure 3. Project location



9.2 Topography and Drainage

The landscape in the study area generally falls westward and is classified as in the Gomkab Basin, characterised by dissected rolling hills with prominent dolerite sills. The site is located within the catchment of the Orange River, a perennial river draining in a westerly direction. The River is situated less than 800m west of the project sites.

Two main rivers emanating from the inland high grounds cross the C13 road at the settlement before joining the Orange River. The relief of these rivers in the area remain intact and supports surface water drainage towards the Orange River.

Proper drainage systems (e.g. erection of culverts) should be developed at the all project sites, in order to control the flow of surface water run-off. Storm water management systems should form part of the engineering designs.

9.2.1 Flood Analysis of Aussenkehr

Aussenkehr is currently in the process of formalizing the settlement and preparing town layouts for approval. As a critical consideration in preparing these layouts, a floodline investigation was conducted, in order to establish the 1 in 100 year floodlines at the settlement. The investigation focused mainly on the extent of flooding in the two main rivers that run through the settlement. Although a detail investigation of the Orange River did not form part of this study, the impact of floods in the Orange River was taken into account and further investigation was recommended.

According to the Flood Analysis Report (WCE, 2018), the two river reaches included in the study have similar characteristics. Both rivers have very steep longitudinal slopes and form braided channels that meander through wide valleys. The valleys are wedged between well-defined banks with heights varying between 2 and 8m. These valleys have been formed by numerous floods eroding away the alluvial soils and carving new, wider and deeper channels with every flood event.

The height of the banks on the sides of the valleys drop towards the downstream end until they disappear approximately 400m from the banks of the Orange River. Although the floodline investigation of the Orange River was not included in the study it was evident that this section might form part of the wider Orange River floodplains. Without the availability of sufficient detail survey data or detail hydrological calculations, a rough model of the Orange River was developed and used as a guideline for planning. The maximum flood peak of 1988 which was deemed to be more severe than a 1 in 100 year flood event was used as the flow input to the model and the resulting floodline extended approximately 400m beyond the banks of the main channel of the Orange River.

Various scenarios were simulated and 1 in 100-year floodlines were generated for each scenario and the resulting floodlines were merged to create a 1 in 100 year floodline that was submitted for town planning purposes. The 1 in 100 year flood



peak was determined to be 13.2m³/s in the North River Reach and 78.2m³/s in the South River Reach.

Deducing from the resulting 1 in 100 floodline drawings generated for the settlement, it is clear that the proposed project sites are outside the floodline of the two river reaches (i.e. north and south river reaches); and outside the Orange River floodline.

9.3 Climatic Conditions

Classification of climate:	Semi-arid area
Average rainfall:	Rainfall in the area is averaged to be less than 50 mm per year.
Variation in rainfall:	Variation in rainfall is averaged to be 60-70 % per year.
Average evaporation:	Evaporation in the area is averaged to be between 3000-3200 mm per year.
Precipitation:	The highest summer rains are experienced in February. Irregular and unpredictable, high intensity, highly localised storm events between October and April does occur. The variation in the precipitation between the driest and wettest months is 6 mm.
Water Deficit:	Water deficit in the area is averaged to be between 2100-2300 mm per year.
Temperatures:	The temperatures are highest in January with an average of 24.3°C. The lowest average temperatures of 14.5°C occur in July during the year. During the year, the average temperatures vary by 9.8°C.
Wind direction:	Wind direction in the area is predominantly southeasterly.

9.4 Hydrogeology of the Study Area

The geology in the area consists of shale and mudstone of the Prince Albert Formation, Ecca Group (Karoo Sequence). All of the underlying formations are classified as hard rock formations. Groundwater flow would be mostly along fractures, faults (secondary porosity) and other geological structures present within the formations.



Groundwater flow from the project sites can be expected in a westerly direction; however local drainage patterns may vary due to surface and groundwater abstraction in the area. According to the Department of Water Affairs (DWA) database, no known boreholes exist within a 5km radius of the site. Depth to water table is expected to be less than 40m below ground level (mbgl).

This area does not fall within water control area; however groundwater belongs to the government of the Republic of Namibia. This means that groundwater remains the property of the government of Namibia and controls the exploration and usage of it. See Figure 4 below, for the hydrogeological.

9.4.1 Aussenkehr Water Supply

Aussenkehr relies on water supply from the Namwater-Aussenkehr water supply scheme at the settlement. The scheme consists of a river abstraction pump station, water treatment plant, intermediate storage reservoir and interconnecting pipelines which convey the water to the terminal reservoir, which is located at the settlement.

Due to the nature and magnitude of the proposed development, the consultant does not consider the water supply to be at risk from the proposed development.

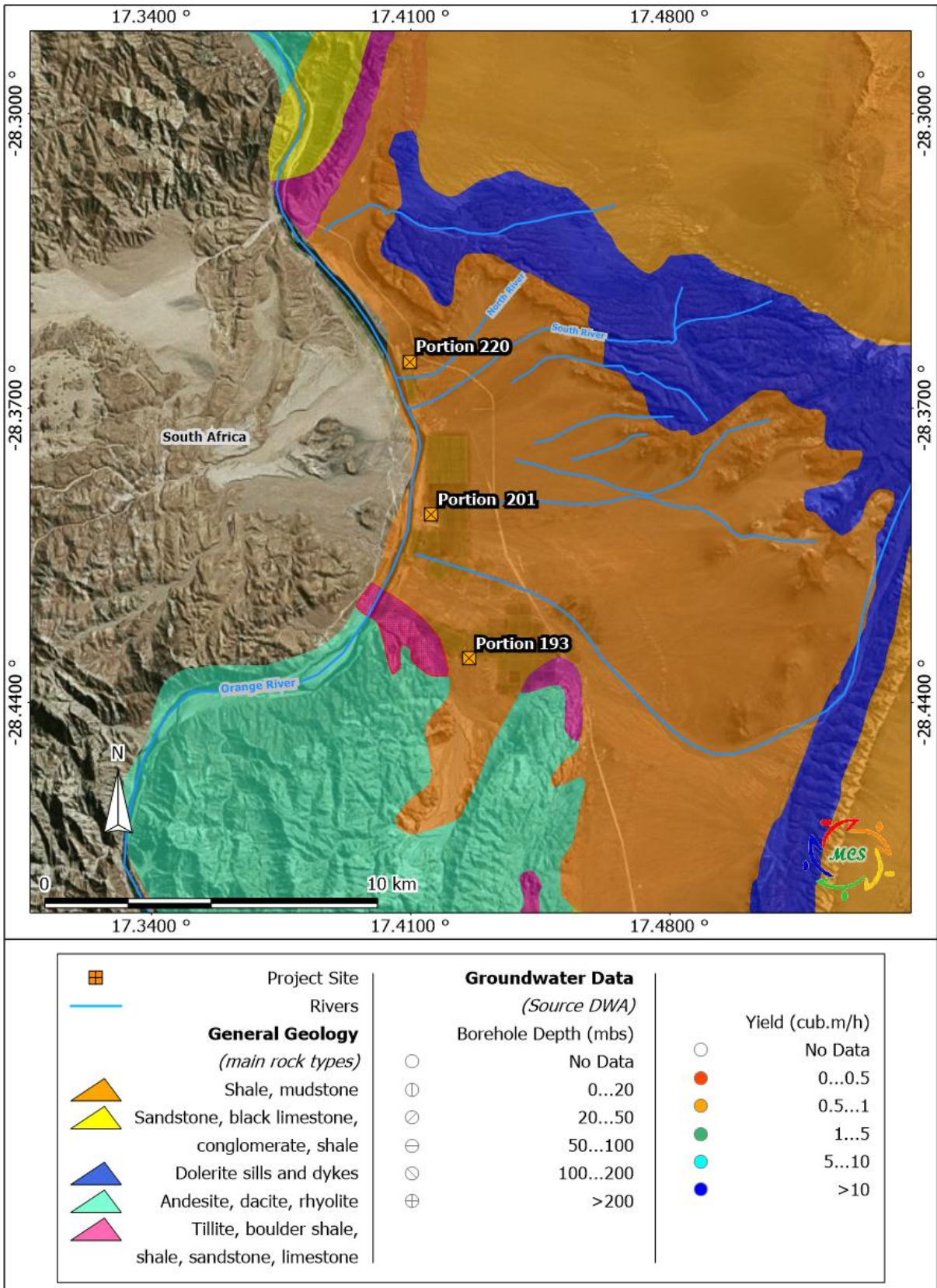


Figure 4. Hydrogeology of Area

9.5 General Ecology

The site falls within the Nama Karoo biome, which is characterised by Edaphic dry sparse shrubland type vegetation. The vegetation structure type is classified as Sparse shrubland.

Portions 193 and 220 are free of vegetation as the land has been cleared in the past and earmarked for development. Large trees (not native) are however present on Portion 201. These trees were introduced in the area by the residence and will be conserved and remain part of the development. The map below illustrates the vegetation type of the study area.

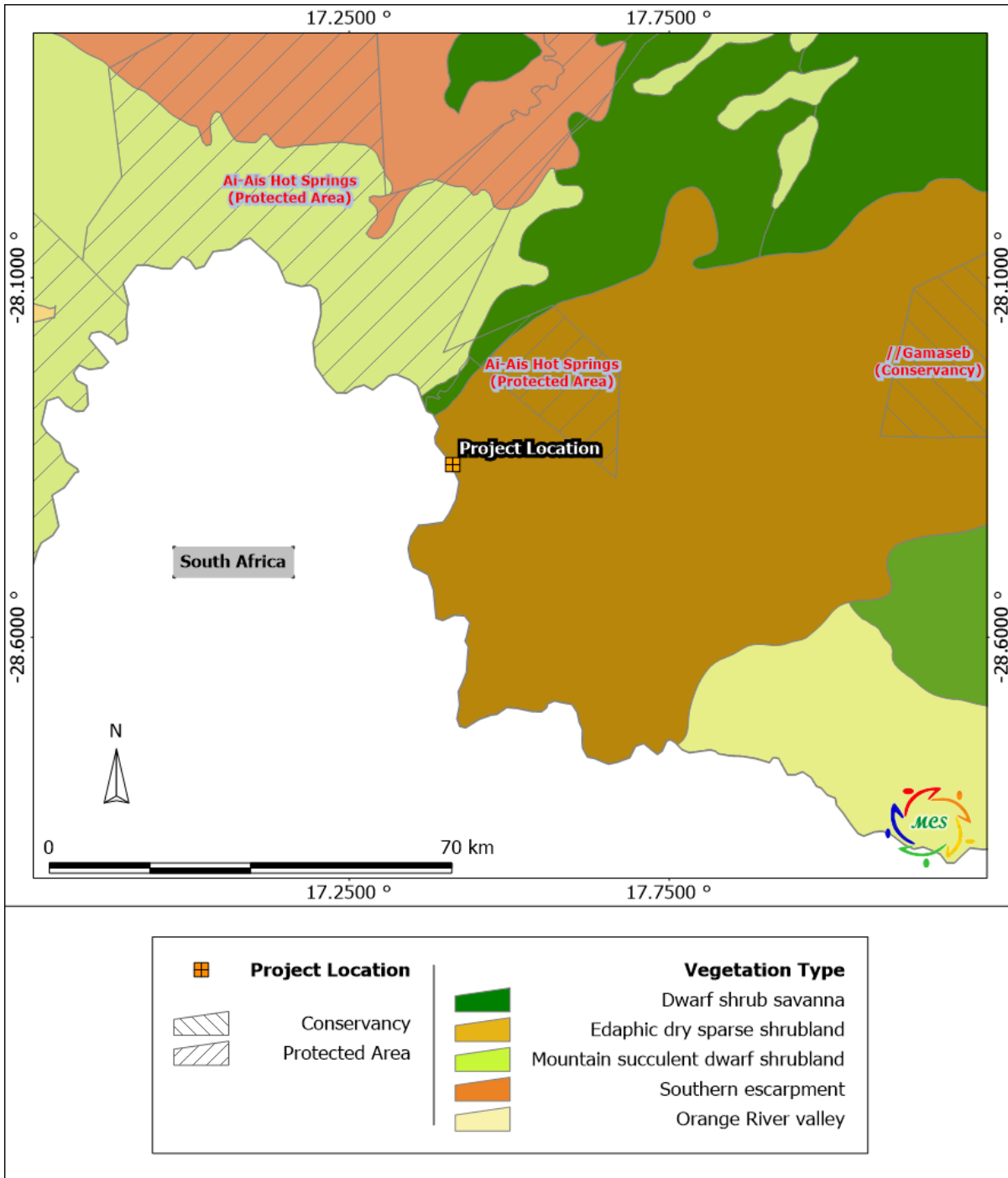


Figure 5. Vegetation map of study area



Deducing from the Atlas of Namibia, the study area is within the area that is known to have 100 to 150 plant species and a low to medium diversity of higher plants (Mandelsohn et al (2003). With regards to fauna, no wildlife has been observed in the vicinity of the study area; however domestic animals do pass the site. Faunal species diversity in the project area is presented in the table below:

Table 2. General Fauna Diversity (Atlas of Namibia)

	Diversity	Endemism
Mammal	61 - 75 Species	7 - 8 Species
Scorpion	16 - 17 Species	1 - 2 Species
Bird	81 - 110 Species	0 Species
Reptile	61 - 70 Species	13 - 16 Species
Frog	4 - 7 Species	N/A
Lizards	> 35 Species	6 - 8 Species
Termite	1 - 6 Genera	N/A
Snakes	20 - 24 Species	5 - 6 Species

9.6 Socio-Economic Aspects

This section provides an overview of socio-economic characteristics of the study area. It provides regional and local information on the, economic activities, population dynamics, vulnerability, and social services currently available in the area.

9.6.1 Aussenkehr

9.6.1.1 Economic Activities

The settlement is the hub for all agricultural activities in the southern part of the //Kharas Region and is linked to Namibia’s rail and road network, making it well situated to service the rest of Namibia and nearby South Africa.

Agriculture, mining, farming and government services constitute the main economic activities in the area. Farming produce is used locally and also exported to neighbouring countries and overseas. Aussenkehr produces some of the most sought after table grapes in the world, for not only are these grape vines highly rated in Europe, but the grape industry is said to be lucrative for the Namibian economy. In fiscal year 2016/17, the grape valley harvested slightly more than 4,6 million cartons of grapes, which raked in N\$600 million in revenue that year. It was reported that in 2015 the grape industry employed 5 500 permanent and 6,000 part-time workers, a number that has increased since then.

The development is a win-win opportunity for all parties involved, whether they are the land owner (Aussenkehr Farms (Pty) Ltd), local residents, motorists, local government and the surrounding communities.



9.6.1.2 Employment Creation (Job Opportunities)

Unemployment still hampers most of the developing world and Aussenkehr is no exception. The proposed development is likely to increase the job opportunities at the settlement. The Construction phase of the project will provide job opportunities, of which 80% are expected to be unskilled and semi-skilled people and can be sourced from the unemployed labour force of Aussenkehr and the surrounding areas.

The principle of maximising local employment creation can be applied by identifying suitable construction contractors in the region.

It is highly likely that suitable construction contractors would be identified in Aussenkehr and nearby larger centres in the region, such as Rosh Pinah, Keetmanshoop, Karasburg and Noordoewer for the construction of the access roads. The region is well-supplied with competent small and medium enterprise (SME) construction companies to conduct the proposed development. The project would also give rise to indirect economic benefits through the procurement of materials, goods and local services.

The local economy of the settlement is expected to benefit from the project. A percentage of moneys derived from salaries and wages earned by construction workers is likely to be spent at the settlement and surrounding areas. The moneys spent in communities around the project location would create substantial flows of revenue within these communities, thus acting as a catalyst for growth in the local economy.

In addition, procurement of construction materials, goods and services would have beneficial downstream economic impacts by stimulating demand up the supply chain. The more goods and services procured from local SMEs or enterprises at the settlement, the greater the project's contribution to the growth of the local economy.

It is therefore recommended that, where feasible, contractors employ local labour by recruiting from local communities and the region at large; that procurement of materials, goods and services from local suppliers be encouraged.

9.6.1.3 Livelihoods

Formal employment with wages and salaries is the main source of income for 69% of households in the region. More than 61% are employed in the private sector (largest employer), the government (second largest employer) employs about 27% of all employed people while individual employers account for 3% of all employed persons.

Farming (7%), Non-farming businesses (5%), cash remittance (6%) and pensions (10%) constitute the main source of income for the remaining households in the //Kharas region. The livelihoods of the local



communities are likely to be positively impacted therefore predicted to be better than before the development in the area.

9.6.1.4 Tourism

Private game farms and conservancies in //Kharas Region offer protection to wildlife which then becomes an attraction to tourists and trophy hunters, in turn providing farm owners with alternate livelihoods as well as sources of income from game farming, hunting and ecotourism.

Aussenkehr is generally the region's south most gateway to other tourist attractions such as the Ai-Ais Protected Area and Hot Springs, Fish River Canyon, Aus, Luderitz etc.

The project area attracts a lot of tourists from all over the world. Excessive waste, dust, noise and vibrations can have negative impacts on the tourism industry in the area, as it can become a nuisance to tourists. Mitigation measures at the site must be put in place to reduce these impacts.

9.6.1.5 HIV & Prostitution

Namibia is one of the ten worst affected countries in terms of the HIV/AIDS epidemic. The HIV prevalence rate for the age group 15 to 49 is estimated at 21.3% for Namibia (UNDP, 2005). The HIV/AIDS prevalence rate in pregnant women aged 15 to 49 years in the //Kharas region is 17%.

The spending powers of contractors working on the project are likely to increase, and this might be a perfect opportunity for sex workers to explore. Migrant labourers from other regions and expatriates are normally vulnerable and may use the services rendered by the sex workers.

Construction camps (if any) often become a focal point for promiscuous sexual activities. Such activities, particularly when carried out without protection, can result in increases in sexually transmitted diseases (STDs) and especially AIDS among neighbouring communities, construction workers and their partners.

Should the HIV prevalence increase, the following consequential issues could arise:

- ✓ Reduced workforce in the //Kharas Region.
- ✓ Diversion of income expenditure to medical care.
- ✓ Increase in orphans and households headed by children.
- ✓ Increase in pregnancy related mortality.
- ✓ The current rate of 3,129 people per doctor could increase.



Educate workers and surrounding communities on measures to prevent the spread of HIV/AIDs through awareness campaigns, provision of safety equipment for workers, child labour prohibited.

9.6.1.6 Infrastructure & Increased Traffic

The proposed access roads on portions 193 and 220 are expected to make a crucial contribution to the local economic development and growth; and bring important social benefits to the settlement. The provision of formalised access to employment, social, health and education services makes a road network crucial in fighting against poverty.

10. STAKEHOLDER PARTICIPATION

Stakeholder consultation forms an integral component of an EIA investigation and enables comments on the potential environmental impacts associated with the proposed development and to identify additional issues which they feel should be addressed in the EIA. The primary aims of public participation were:

- ❖ To inform I&APs and key stakeholders about the proposed development
- ❖ To identify issues and concerns of key stakeholders and I&APs with regards to the proposed development.
- ❖ To provide information to enable informed decision making
- ❖ To develop a communication structure with stakeholder and I&APs
- ❖ To promote transparency of the project
- ❖ To ensure the public and stakeholders comments are considered for the development.

Public participation notices were placed and run in two local newspapers on two different occasions, namely; (See Appendix C).

- ✓ The New Era Newspaper, 16 and 23 July 2020
- ✓ The Confidente, 16 and 23 July 2020

In the adverts an e-mail address, phone number and fax number was provided to the general public to register as interested and affected parties; and to request a background information document for the project. The adverts also emphasised the need for proactive participation from the public during the public participation process.

No public meeting was held for the project due to the status quo of COVID-19 prevention measures at the time. However, comments and suggestions were encouraged and welcomed via telephone and emails. A background information document (See Appendix B) was prepared for all I&APs and stakeholders regarding the proposed development.



At the time of report writing, no environmental or social concerns regarding the facility were received by the consultant from the general public.

Table 3. Interviewed Stakeholders/I&APS

NAME	ORGANISATION/ERF	DESIGNATION/POSITION
Ms. T. Iyambo	Ministry of Mines and Energy.	EA procedure, Consultation
Ms. S. Angula	Ministry of Environment and Tourism, Directorate of Environmental Affairs.	EA procedure
Mr. L. Ljubomir	Aussenkehr Farms (Pty) Ltd / Proponent	Project Information
Mr. B. Ljubomir	Aussenkehr Farms (Pty) Ltd / Proponent	Project Information
Mr. G. van der Merwe	J.G van der Merwe Town and Regional Planning Consultant / Town Planner	Project Information
Mr. K. Dominitus	NAMPAB	Competent Authority

Consultation with the department of Environmental Affairs (MET) included the environmental assessment procedure and application procedure.

11. ENVIRONMENTAL IMPACT EVALUATION

The Environmental Impact Assessment sets out potential positive and negative environmental impacts associated with the proposed development. The following assessment methodology will be used to examine each impact identified, see Table 4.

The Construction Phase of this project is especially applicable to the construction of the access roads on portions 193 and 220.

Table 4. Impact Evaluation Criterion (DEAT 2006)

Criteria	Rating (Severity)	
Impact Type	+VE	Positive
	0	No Impact
	-VE	Negative
Significance of impact being either	L	Low (Little or no impact)
	M	Medium (Manageable impacts).
	H	High (Adverse impact).

Probability:	Duration:
5 - Definite/don't know	5 - Permanent
4 - Highly probable	4 - Long-term (impact ceases)
3 - Medium probability	3 - Medium-term (5-15 years)
2 - Low probability	2 - Short-term (0-5 years)
1 - Improbable	1 - Immediate
0 - None	
Scale:	Magnitude:
5 - International	10 - Very high/don't know
4 - National	8 - High
3 - Regional	6 - Moderate
2 - Local	4 - Low
1 - Site only	2 - Minor
	0 - None

11.1 Construction Phase

11.1.1 Erosion and Sedimentation

The constant movement of heavy construction vehicles during construction tend to compact the soil surface, which can reduce infiltration capability, and increase surface water runoff.

Proposed Mitigation Measures

- ✚ Avoid unnecessary removal of topsoil cover during construction.
- ✚ Ensure stockpiles are located within the boundary of the site and are protected from erosion.
- ✚ Stabilise cleared areas as soon as possible to prevent and control surface erosion.
- ✚ Limit clearing of vegetation to those areas within the footprint of construction.



- ✚ Minimise open areas and reduce the frequency of disturbance.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Erosion and Sedimentation	-VE	1	2	4	2	M	L

11.1.2 Dust Pollution and Air Quality

Dust problems are expected to be site specific and will not pose a nuisance to any neighbouring business and residences. Dust will be generated during the construction phase and might be worse during the winter months when strong winds occur. Dust is regarded as a nuisance as it reduces visibility, affects the human health and retards plant growth.

Release of various particulates and exhaust fumes from construction vehicles and machinery during construction activities is also expected to take place.

Proposed Mitigation Measures

- ✚ Ensure measures are in place to minimise dust generated during the construction phase.
- ✚ Use appropriate dust suppression measures when dust generation is unavoidable, e.g. dampening with water, particularly during prolonged periods of dry weather.
- ✚ Avoid excavation, handling and transport of materials which may generate dust under high wind conditions.
- ✚ Locate stockpiles of construction materials in sheltered areas where they are not exposed to erosive effects of the wind.
- ✚ Ensure all vehicle, plant and equipment are in good condition.
- ✚ Encourage reduction of engine idling.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust	-VE	1	1	6	3	L	L

11.1.3 Noise Impact

An increase of ambient noise levels at the construction sites are expected due to the construction activities. Noise pollution due to heavy-duty equipment and machinery will be generated. It is not expected that the noise generated during construction will impact any third parties very much.

Proposed Mitigation Measures

- ✚ Ensure the use of construction vehicles and equipment that emit reduced noise levels.
- ✚ Ensure proper maintenance is conducted on vehicles to ensure the reduction of noise emission.



- ✚ The construction staff should be equipped with ear protection equipment.
- ✚ Audio equipment (if any) should not be played at levels considered intrusive by others.
- ✚ Construction activities will be limited to a period between 08h00 and 17h00.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Noise	-VE	1	1	4	3	L	L

11.1.4 Safety & Security

Safety issues could arise from the construction vehicles, earthmoving equipment and tools that will be used on site during the construction phase. This increases the possibility of injuries and the contractor must ensure that all staff members are made aware of the potential risks of injuries on site. Construction sites usually house construction building material and equipment on site which may attract criminal activities.

Proposed Mitigation Measures

- ✚ Display telephone numbers of emergency services at the project location.
- ✚ Provide suitable emergency and safety signage on site (manufactured of durable, weatherproof material). The signage signs should be placed at strategic locations to ensure awareness.
- ✚ Demarcate and barricade any areas which may pose a safety risk (including hazardous substances, deep excavations etc). These notices must be worded in English and any languages deemed necessary.
- ✚ Enforce the use of appropriate Personal Protective Equipment (PPE) for the right task or duties at all times.
- ✚ Prevent illegal access to the construction sites by implementing appropriate security measures. These security measures must not pose a threat to surrounding communities.
- ✚ Should a construction camp be necessary, it should be located in such a way that it does not pose a risk to the public.
- ✚ Equipment housed on site must be placed in a way that does not encourage criminal activities.
- ✚ Sensitize operators of earthmoving equipment and tools to switch off engines of vehicles or machinery not being used.
- ✚ The contractor is advised to ensure that the team is equipped with first aid kits and that they are available on site, at all times.
- ✚ Proper barricading around the work sites should be erected to avoid entrance of animals and/or unauthorized persons.
- ✚ Adequate lighting within and around the construction location should be erected, when visibility becomes an issue.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Safety & Security	-VE	1	1	4	2	M	L

11.1.5 Traffic

Construction vehicles will access the project sites from the C13 main road (via existing access roads to the different portions). Construction related activities are expected to have a minimal impact on the movement of traffic along these roads, due to the fact that construction vehicles will frequent the site only periodically.

No diversion of traffic or closure of the road is expected, however a slight nuisance might be experienced by motorists using the road. This will most likely be caused by slow moving vehicles frequenting the construction site. It is however expected to be short-lived.

Proposed Mitigation Measures

- ✚ Install and maintain official traffic signalling (where necessary) along the access road(s) / intersections in conjunction with local or national traffic regulations.
- ✚ Speed limit warning signs must be erected to minimise accidents.
- ✚ Construction vehicles and machinery must be tagged with reflective signs or tapes to maximise visibility and avoid accidents.
- ✚ Where feasible, Construction vehicles should not travel to and from the site during peak times (before 08h00 and after 17h00), to minimise impacts on traffic.
- ✚ Construction vehicles should not be allowed to obstruct the road, hence no stopping in the road, wholly or partially, but rather pull off the road or park on the roadside.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Traffic	-VE	1	1	2	2	L	L

11.1.6 Groundwater

Groundwater quality could be impacted through leachate of petroleum, chemical, harmful and hazardous substances. In particular, oil leakages, diesel, lubricants and grease from construction vehicles, equipment and machinery utilised during the construction phase may occur. Care must be taken to avoid contamination of soil and groundwater.

Overflow of temporary sewage systems (if any) at the project sites might transport the effluent to nearby surface water bodies; or to areas where sensitive geological structures and formations are present. Inflow into these structures and formations would cause a pollution threat.

Proposed Mitigation Measures



- ✚ Prevent spillages of any chemicals and petroleum products (i.e. oils, lubricants, petrol and diesel). Use drip trays, linings or concrete floors when evidence of leaks are observed on vehicles or equipment.
- ✚ All fuelling, storage and chemical handling should be conducted on surfaces provided for this purpose. Drip trays, linings or concrete floors must be used when removing oil from machinery.
- ✚ Spillage control procedures must be in place according to relevant SANS standards or better. Waste water collection systems should be connected to these systems.
- ✚ Should temporary toilet facilities be necessary, adequate containment systems should be erected at the site for use during the construction phase.
- ✚ Waste should properly be contained to avoid any leakages and/or spillages, and should regularly be disposed off at a suitable sewage disposal site. Run-off from these toilets due to overflows should be avoided at all cost.
- ✚ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater	-VE	2	2	4	2	M	L

11.1.7 Surface Water

Local drainage is well developed and runoff takes place through drainage lines in the area, eventually feeding the nearby Orange River. Contamination of surface water might occur through petroleum, chemical and hazardous substances. Contaminants in the form of oil leakages, diesel, lubricants and grease from the construction equipment and machinery may occur during the construction phase.

Proposed Mitigation Measures

- ✚ Use drip trays, linings or concrete floors when evidence of leaks are observed on construction vehicles or equipment.
- ✚ Remove leaking vehicles from project location immediately.
- ✚ All servicing and maintenance of vehicles and/or equipment should be conducted at an appropriate workshop or garage.
- ✚ Any spillage of hazardous substances including fuel, oil, paint or cleaning solvent must be cleaned up immediately and disposed off at a designated disposal facility.
- ✚ Prevent discharge of any pollutants, such as cements, concrete, lime, chemicals, and hydrocarbons into the nearby water course.
- ✚ Prevent illegal washing out of containers in nearby water courses.
- ✚ Properly secure all temporary / portable toilets (if any) to the ground to prevent them toppling due to wind or any other cause.
- ✚ Maintain toilets in a hygienic state and remove waste to a licensed disposal facility.



- ✚ Ensure that no spillages occur when the toilets are cleaned or emptied. Prohibit urination on site, other than at designated facilities.
- ✚ Contain contaminated water from batching operations and allow sediments to settle before being disposed of as waste water.
- ✚ Stabilise cleared areas as soon as possible to prevent and control surface erosion.
- ✚ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis.
- ✚ An emergency plan should be in place on how to deal with spillages and leakages during this phase.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Surface water	-VE	2	2	4	2	M	L

11.1.8 Generation of Waste

Waste material will be generated during the construction activities of the roads. Waste in the form of rock cuttings, pipe cuttings, oil spills or leakages of petroleum products might occur during the construction phase.

Proposed Mitigation Measures

- ✚ Ensure that sufficient weather- and vermin- proof bins / containers are present on site for the disposal of solid waste. Waste and litter generated during this phase must be placed in these disposal bins.
- ✚ Empty bins regularly as required.
- ✚ Contractor shall institute a waste control and removal system for the site.
- ✚ All waste shall be disposed off site at an approved landfill site. Consultation with the proponent should be conducted in this regard.
- ✚ No disposal of /or burying of waste on site should be conducted. No waste should be burned on site.
- ✚ Separate hazardous wastes from general waste, clearly marked, and stored in appropriate containers.
- ✚ Solid and liquid hazardous waste shall be stored in separate containers.
- ✚ The hazardous waste storage is to be clearly marked to indicate the presence of hazardous substances, and the protocols associated with handling of such hazardous wastes shall be known by all relevant staff members.
- ✚ Regular inspection and housekeeping procedure monitoring should be maintained at all times.
- ✚ Awareness of the hazardous nature of various types of waste should be enforced.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste Generation	-VE	1	2	6	4	M	L



11.1.9 Heritage Impacts

There are no known heritage areas envisaged to be impacted by the new development; however the contractor might come across archaeological features or objects that possess cultural values during construction activities.

Proposed Mitigation Measures

- ✚ If such remains or objects with cultural values (e.g. bones, weapons, ancient cutlery, graves etc) are uncovered at the project location or surrounding, it should be barricaded off, and
- ✚ The relevant authorities (i.e. the local police and National Heritage Council of Namibia) should be contacted immediately.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Heritage	-VE	1	1	2	2	L	L

11.1.10 Ecological Impacts

The project sites itself are free of conservation worthy vegetation.

Proposed Mitigation Measures

- ✚ Disturbance of areas outside the designated working zone is not allowed.
- ✚ No vegetation should be removed outside the designated project area.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology	-VE	1	1	2	2	L	L

11.1.11 Socio-Economic Aspects

Temporary employment opportunities are anticipated to be created during construction, both directly through construction workers and indirectly through suppliers, service providers, and informal traders attracted to the project site.

Proposed Mitigation Measures

- ✚ Construction contractor(s) should be sourced from the area, or region at large (where feasible).
- ✚ Construction workers should be sourced from the area, or region at large (where feasible).
- ✚ Suppliers of construction materials should be sourced from the area, or region at large (where feasible).
- ✚ Locally source services required during the construction process, such as securities, rental of portable toilets, plant hire, etc.
- ✚ Designate an area outside the construction site for informal traders (if any), to allow them to trade.



Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Socio-economic	-VE	1	1	6	4	L	L

Summary of all potential impacts during the construction phase:

In general, impacts are expected to be low to medium, mostly short lived and site specific. Mitigation options recommended in the Environmental Management Plan (EMP) will guide and ensure that the impacts of the construction work are minimised. It is further advised that traffic signs and barricades be installed around any excavations to ensure safety. Proper storm water management plans must be in place to minimise the risk of flooding and pollution, and must form part of the engineering designs.

The appointed contractor should be made aware of the content and environmental requirements of this report through proper induction training.

11.2 Operational Phase

11.2.1 Air Quality

Air quality around the site could be impacted by exhaust fumes from the vehicles frequenting and accessing the project sites.

Proposed Mitigation Measures

- ✚ Encourage reduction of engine idling at the project sites.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Air Quality	-VE	1	4	4	2	L	L

11.2.2 Generation of Waste

Waste such as contaminated soil, litter and various types of waste will be generated during the operational phase.

Proposed Mitigation Measures

- ✚ Any contaminated soil generated must be contained and bioremediated accordingly.
- ✚ Waste bins must be available along all road corridors and project sites at all times.
- ✚ Waste must be appropriately collected and disposed off at an approved appropriate waste disposal site.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste Generation	-VE	1	4	4	2	L	L



11.2.3 Surface and Groundwater

Spillages and leakages of oil, petrol, diesel, lubricants and grease may occur from vehicles and equipment frequenting the project sites. Contaminated soil might pose a risk to surface water.

Proposed Mitigation Measures

- ✚ Use drip trays or linings when evidence of leaks are observed on vehicles or equipment frequenting the sites.
- ✚ The presence of an emergency response plan and suitable equipment is advised, so as to react to any spillage or leakages properly and efficiently.
- ✚ Ensure all stormwater drains or channels are clear of litter or obstructing material.
- ✚ Remove all excess sedimentation, rubble and any other waste material present in the waterway and dispose of in a suitable manner to ensure proper drainage runoff.
- ✚ Ensure that stormwater management systems are regularly maintained and tested, and are in good working order.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Surface water	-VE	1	2	6	3	M	L

11.2.4 Health and Safety

Safety issues could arise from the vehicles and equipment frequenting the sites and during maintenance activities. This increases the possibility of injuries and all project personnel must be made aware of the potential risks of injuries on site.

Proposed Mitigation Measures

- ✚ Fire fighting equipment should be made available at strategic locations along the road corridors and project sites and must be serviced regularly.
- ✚ Display contact details of emergency services in the area at strategic locations of the facility.
- ✚ Demarcate and place signage on any areas which may pose a safety risk (including trenches, excavations etc).
- ✚ The project personnel are advised to ensure that proper personal protective gear and first aid kits are available, at all times.
- ✚ Staff should be properly trained in first aid and safety awareness.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Health & Safety	-VE	1	3	6	3	M	L



11.2.5 Traffic

Although negligible, a slight increase in traffic will be experienced along the C13 and new access roads due to vehicles making use of new roads. This impact will be long-lived.

Proposed Mitigation Measures

- ✚ Speed limits and road signs as set out by national traffic regulations should be adhered to in order to minimise accidents.
- ✚ Appropriate road signs should be erected to reduce these impacts and their spin-offs.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Traffic	-VE	1	4	6	3	M	L

11.2.6 Ecological Impacts

The operations of project sites will have minimal impacts on fauna and flora in the area.

Proposed Mitigation Measures

- ✚ The operational activities would not exceed the demarcated areas of the project sites.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology	-VE	1	2	2	2	L	L

11.2.7 Socio-Economic Aspects

The creation of new employment opportunities is considered to be a positive impact. It is not clear as to exactly how many employment positions will be created, however new jobs are envisaged for the development.

Proposed Mitigation Measures

- ✚ Employment creation should be targeted at Aussenkehr and the immediate communities.
- ✚ Suppliers of operational stock should be sourced from the settlement, or region at large.
- ✚ Locally source services required during the operational process, such as securities, rental of portable toilets, plant hire, etc.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Socio-economic	-VE	1	1	8	2	L	L



12. CUMMULATIVE IMPACTS

Construction: Possible cumulative impacts associated with the construction phase include an increase in traffic visiting the site. An increase in emissions from these vehicles will be experienced, decreasing the air quality around the proposed development. Wear and tear on the roads could be expected, coupled with increased risks of road traffic incidences. These impacts will be short lived for the duration of construction.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Cummulative impacts	-VE	2	2	6	2	L	L

Operational: Potential cumulative impacts associated with the operational phase include increase in traffic around the project sites. Emissions from vehicles using the roads and frequenting the project sites, coupled with the existing emissions from vehicles in the surrounding areas, the air quality will be impacted.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Cummulative impacts	-VE	2	2	6	2	M	L

13. ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (**EMP**) provides management options to ensure impacts of the proposed development are minimised. An EMP is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented, and the positive benefits of the projects are enhanced.

The objectives of the EMP are:

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

The EMP acts as a stand-alone document, which can be used during the various phases of the proposed development. All contractors taking part in the construction of the facility should be made aware of the contents of the EMP. An EMP for the construction, operational and decommissioning phases of the proposed development has been developed and is attached as Appendix A.



14. CONCLUSIONS

In general, the proposed development would pose limited environmental and social risks.

The Environmental Management Plan should be used as an on-site tool during all phases of the proposed development. Future environmental audits should be carried out to ensure compliance of the EMP and environmental regulations of Namibia. Parties responsible for non-conformances of the EMP will be held responsible for any rehabilitation that may need to be undertaken.

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