Northern Fuel Distributors CC

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Environmental Management Plan (EMP)

Northern Fuel Distributors wishes to install 1 x 23,000L above ground Diesel Tank with Retail Pump. A bund wall, spill slab and separator pit will be installed as per SANS standards. All safety signage, emergency response procedures and safety training will be supplied and done by Northern Fuel Distributors.

Northern Fuel Distributors seeks approval for the issue of an Environment Clearance Certificate to be made out to our customer below:

CUSTOMER:

Kaap Agri Outjo Depot
14 Stasiestraat
Outjo
20°06'22.9''S
16°09'12.6''E

1. Introduction and Background

The EMP is developed to outline measures to be implemented in order to minimize adverse environmental degradation associated with this development. The EMP serves as a guiding tool for contractors and workforce on their roles and responsibilities concerning environmental management on site and also provides an environmental monitoring framework for all projects phases of the development. This environmental management plan aims to take a pro-active route by addressing potential problems before they occur. The EMP acts as a stand-alone document, which can be used during the various phases of the development.

The purpose of the EMP is to:

1. Describe all monitoring procedures required to identify environmental impacts.
2. Minimize disturbance of the natural environment.
3. Promote and encourage good environmental management practices.
4. Outline responsibilities and roles of Northern Fuel Distributors and the contractor in managing the environment.
5. Train employees and contractors with regard to environmental obligations.
6. Prevent all forms of pollution.
7. Protect the natural environment.

8. Develop waste management practices.
9. Comply with all applicable laws, regulations and standards for environmental protection.

2. Environmental Management Structures

Roles, responsibilities and authority shall be defined, documented and communicated in order to facilitate effective environmental management through implementation of the EMP. Management shall provide resources to the implementation and control of the EMP including: human resources, technology and financial resources.
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.

The responsibility matrix table below shall be assigned for the project:

Function	Title	Responsibility
Environmental Manager (EM)	Northern Fuel Distributors / Project Manager	* Overall management of project and EMP implementation. * Oversees site works, liaison with Contractor, ESO and ECO
Environmental Control Officer (ECO)	Northern Fuel Distributors / Coordinator	* Implementation of EMP and liaison between NFD, Department of Environmental Affairs (MET), local authority, Contractor and Landowners / stakeholders.
Environmental Site Officer (ESO)	SHE Officer (NFD)	* Interaction with ECO, Landowners and laborers. ESO must understand the content of the EMP.
Contractor / Suppliers	To be appointed	* Implementation and compliance with recommendations and conditions of the EMP, appoints dedicated person (ESO) to work with (ECO).

The general roles and responsibilities of various parties during the operational phase of the project are outlined below:

2.1 Roles of the Environmental Manager (EM)

The EM will act as the employer's on-site implementing agent and has the responsibility to ensure that the Clients responsibilities are executed in compliance with the relevant legislations. Any on-site decisions regarding environmental management are ultimately the responsibility of the EM. The on-site EM shall assist the ECO where necessary and will have the following responsibilities in terms of implementation of this EMP:

1. Be fully knowledgeable with the contents of the Construction EMP.
2. Review and authorize updates to the EMP.
3. Ensure resources allocation for implementation of the EMP requirements.
4. Ensure that environmental requirements are integrated into project plans, work method statements, tender and contract documents.
5. Ensure necessary support to the ESO for implementation of the EMP.
6. Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the EMP implementation is at an optimal level.
7. Participate in environmental performance verification activities to verify the level of compliance with the EMP in delivering the legal and environmental obligations.
8. Assess the efficacy of the EMP and identify possible areas of improvement or amendment required within the EMP.
9. Participate in incident investigations (as required).
10. Initiate external audits (as required).

2.2 Roles of the Environmental Control Officer (ECO)

The ECO for the site is an independent environmental consultant appointed by NFD to monitor and review the on-site environmental management and implementation of this EMP on the construction site.

The duties of the ECO:

1. Ensure that all operational activities on site are undertaken in accordance with EMP.
2. Undertake compliance audits against the EMP and conditions of the Environmental Authorization (where required).
3. Provide support and advice to the project team, contractors and all suppliers in the implementation of environmental management procedures and corrective actions.
4. Ensure that monitoring programs, which assesses the performance of the EMP, are implemented.
5. Assist in the investigation of incidents and non-conformances and confirm in conjunction with the ESO that corrective and preventive action is taken and is effective.
6. Assess the efficiency of the EMP and identify possible areas of improvements or amendment required within the EMP.

7. Facilitate the amendment of the EMP in conjunction with the Environmental Manager (as required).
8. Provide environmental training for key personnel (in communication with Environmental Manager).
9. Reviewing and approving method statements in consultation with the Environmental Manager.
10. Prepare audit report (and submit reports to the relevant authority as required).

2.3 Roles of the Environmental Site Officer (ESO)

The ESO is expected to administer and control all environmental matter relating to the operational activities of the fuel storage facility. This can be the SHE officer at the fuel site. The ESO will conduct the following:

1. Ensure that the latest EMP documents are on site and readily accessible as required.
2. Monitor all appointed contractors activities for compliance with the various environmental requirements contained in this EMP.
3. Identify areas of non-compliance and recommend measures to rectify them in consultation with the ECO and the EM as required.
4. Ensure communication of EMP requirements to relevant projects, contractors and sub-contractor as required for EMP implementation.
5. Perform ongoing environmental awareness training of the site and all appointed contractors site personnel.
6. Ensure that environmental problems are remedied timeously and to the satisfaction of the ECO and the EM as required.
7. Request the removal of people and/or equipment not complying with the specifications of EMP.
8. Facilitate environmental induction of all project staff and either deliver or coordinate delivery of all such training that would be required for the effective implementation of the EMP.
9. Set up activity based method statements prior to the start of relevant construction activities and submit these to the EM and the ECO as required.
10. Maintain environmental incidents and stakeholder complaints register.
11. Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the EMP implementation is at an optimal level.
12. Report significant incidents internally and externally as required by law and the conditions of authorization.
13. Investigate incidents and recommend corrective and preventative actions.

2.4 Roles of Contractors (including suppliers, and service providers)

Contractors conducting work at the site shall ensure that all their staff and employees are familiar with, understand and adhere to the EMP. Failure by any contractor to show adequate consideration to the environment aspects of this contract shall be considered sufficient cause for the ECO to instruct the EM to have the employee removed from the site. The EM will also order the removal of

equipment from the site that is causing continual environmental damage (e.g. leaking oils and grease, diesel and petrol fuels and any other hazardous substance). Such measures will not replace any legal proceedings the client may institute against the Contractor.

The EM shall order the contractor to suspend part or all of the works if the contractor and/or any sub-contractor, suppliers, etc., fail to comply with both the EMP and procedures supplied by the ESO or EM. The suspension will be enforced until such time as the offending procedure or equipment is corrected and/or if required remedial measures are put in place.

By virtue of the environmental obligations delegated to contractors through the Contract Document, all workers (including subcontractors, suppliers, and service providers) appointed for the project would be responsible for:

1. Ensuring adherence by providing adequate staff and provisions to meet the requirements of the EMP.
2. Ensuring that Method Statements are submitted to the EM for approval before any work is undertaken, and monitor compliance with the EMP and approved Environmental Method Statements.
3. Ensuring that any instructions issued by the ESO and/or EM are adhered to.
4. Ensuring the representation of a report at each site meeting, documenting all incidents that have occurred during the period before the site meeting.
5. Undertake daily, weekly and monthly inspections of the work area(s).
6. Ensuring that a register of all the transgressions issued by the ESO is kept in the site office.
7. Ensuring that a register of all public complaints is maintained.
8. Ensure that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the environmental requirements of the Contract.
9. Report and record any environmental incidents caused by the Contractor or due to the Contractors activities.
10. Obtain required corrective action within specified time frames and close out of environmental incidents.
11. Provide weekly checklists to the EM and ESO.

3. Environmental Management Plan

3.1 Training and Induction

Northern Fuel Distributors is bound to be responsible for ensuring that environmental awareness education of all employees and contractors is done satisfactory. NFD should ensure that employees and contractors are made aware of the environmental requirements of the project.

The EMP should form part of the Terms of Reference for all contractors, sub-contractors and suppliers. All contractors, sub-contractors and suppliers will have to sign an agreement to assure that they understood the EMP and that they will comply. All senior staff should familiarize themselves with the full contents of the

EMP and its implications. Senior staffs are expected to train and assist the rest of the employees on the contents of the EMP.

3.2 Environmental Incident Reporting

All environmental incidents occurring at the facility shall be recorded. The incident report should include time, date, location, and nature of the incident, extent of the incident, actions taken, and personnel involved.

All complaints received from the neighboring properties/communities should be directed to the manager of NFD and channeled to the ECO officer. Northern Fuel Distributors Management should be able to respond to the complainant within a week. It is important that the issues raised are considered and that the complainant feels that their concerns have been addressed to and the environmental register and all responses and actions taken to address these should be recorded.

3.3 Environmental Monitoring

Periodic environmental monitoring must be taken on a regular basis. Monitoring should be done in order to ensure compliance with all aspects of the EMP. Findings should be liaised with to all responsible officers as chain command.

3.4 EMP Administration

Copies of this EMP shall be kept at the site office and should be distributed to all senior staff members, including those of the contractors.

3.5 EMP Amendments

The EMP amendments can only be made with the approval of the ECO officer and ultimately the DEA. Amendments to the EMP should be liaised to all employees and contractors.

3.6 Non Compliance of the EMP

Problems may occur in carrying out mitigation measures or monitoring procedures that could result in non-compliance of the EMP. The responsible personnel should encourage staff to comply with the EMP, and address acts of non-compliance and penalties.

Northern Fuel Distributors is responsible for reporting non-compliance with the EMP, to the ECO officer. The management of NFD, in consultation with the ECO officer must, thereafter, undertake the following activities:

1. Investigate and identify the cause of non-compliance.
2. Implement suitable corrective action as well as prevent recurrence of the incident.
3. Assign responsibility for corrective and preventative action.

4. Any corrective action taken to eliminate the causes of non-compliance shall be appropriate to the magnitude of the problems and commensurate with the environmental impact encountered.

3.7 Environmental Register

An environmental register should be kept on site in which incidents related to actual impacts are recorded. This will include information related to incidents as spillages, dust generation and complaints from adjacent neighbors. It should also contain information relating to actions taken. Any party on site may complete the register, however, it is envisaged that the site manager and the ECO will be the main contributors, and who will also be the main parties involved in suggesting mitigation measures.

3.8 Site Management

Areas outside this designated working zone shall be considered “no go” areas. The offloading zones must be clearly demarcated when offloading goods to enhance safety around the proposed development.

3.8.1 Fire and safety Management

Hydrocarbons are volatile under certain conditions and their vapors in specific concentrations are flammable. If precautions are not taken to prevent their ignition, fire and subsequent safety risks may arise.

No fire, whether for cooking or any other purpose, is to be made at the fuel storage facility. All site personnel and contractors shall take all reasonable measures and active steps to avoid increasing the risk of fire through activities on site and prevent the accidental occurrence or spread of fire; and shall ensure that there is sufficient fire-fighting equipment on site at all times. This equipment shall include fire extinguishers. All site personnel and contractors should be prepared for such events.

The Northern Fuel Distributors Management together with all site personnel and contractors shall take all reasonable measures to avoid increasing the risk of fire and shall ensure that there is sufficient fire-fighting equipment on site at all times.

3.8.2 Staff Management

Northern Fuel Distributors and its contractors must ensure that all their employees have suitable protective equipment and properly trained in fire-fighting and first aid.

3.8.3 Waste Management

All waste shall be removed off-site to designated waste disposal site. Sufficient bins or containers on-site to store any solid waste produced should be provided by NFD. The bins and containers should be waterproof and scavenger-proof.

The project team and, where applicable, subcontractors will ensure that the removal of all inert / non-hazardous waste is recorded on Waste Transfer Notes. Legible copies of all Waste Transfer Notes must be kept for a minimum of two years following collection. These documents will be stored on site and made available on request.

When considering management options for identified waste streams, NFD and supply chain members will adhere to the principles outlined in the waste hierarchy below:

3.8.4 Hydrocarbons Management

If any spillage occurs, contaminated soil shall be collected in a holding tray or drum and which will then be disposed at a licensed hazardous waste site. Any spillage of more than 200 liters must be reported to the Ministry of Mines and Energy as per the Petroleum Products Act.
Northern Fuel Distributors and its contractors shall take all reasonable measures to prevent surface or groundwater pollution from the release of oils and fuels.
Sufficient space should be left in fuel storage tanks to allow for fuel expansion and to prevent leakage of fuel from the fuel storage facility.

3.8.5 Flood Management

Storm water management of the site should be a key aspect of flood management on site. All storm water systems, culverts and waterways should be kept clean to allow storm water to flow freely.

3.8.6 Accidents on Site

Northern Fuel Distributors and its contractors shall comply with the Occupational Health and Safety Act and any other national, regional or local regulations with regard to safety on site. The Contractor shall ensure that contact details of the local medical services are available to relevant construction personnel prior to commencing works.

3.8.7 Emergency advisory procedures

Contractors shall ensure that there is an emergency advisory procedure on site before commencing any operations that may cause damage to the environment. The Contractor shall also ensure that site staffs are familiar with all emergency procedures to be followed.
The Contractor shall ensure that lists of all emergency telephone numbers/contact people are kept up to date, and that all numbers and names are posted at the construction site at all times.

4. Management of Environmental Aspects during Operational and Maintenance Activities

This section will look at potential environmental impacts, which may arise during the operational phase of the proposed construction site. The impacts associated with maintenance activities and possible site decommissioning is similar to construction activities.

Ground Water:

Maintenance / Decommissioning phase	
Description	Groundwater contamination can be caused by leakages and spills of petroleum products (i.e. oil leakages, hydrocarbon fuel, lubricants and grease) from machinery and equipment during maintenance and possible decommissioning activities. Care must be taken to avoid contamination of soil and groundwater.
Proposed Mitigation Measures	● Prevent spillages of any chemicals and petroleum products (i.e. lubricants, petrol and diesel). Use drip trays, linings or concrete floors when evidence of leaks are observed on vehicles or equipment. ● No servicing and maintenance of vehicles and/or equipment should be conducted at the site. ● Existing ablution facilities at the site should be used. No urinating outside these designated facilities shall be allowed. ● Proper environmental awareness and remedial response training of operators must be conducted on a regular basis.
Proposed Monitoring	● Regular visual inspection
Responsible Party	● Northern Fuel Distributors / Contractors

Operational Phase	
Description	Groundwater quality could be impacted through leachate of oil leakages, hydrocarbon fuel, lubricants and grease from road fuel tankers; and vehicles frequenting the facility. Spillages may also occur during fuel delivery to the above/below ground storage tanks from road fuel tankers. Care must be taken to avoid contamination of soil and groundwater.
Proposed Mitigation Measures	● All operational surfaces and fuel storage facilities must be installed with spill containment areas as per the relevant SANS standards (or better). Special emphasis is placed on SANS 10089:1999, SANS 100131:1977, SANS 100131:1979, SANS 100131:1982, SANS 100131:1999. ● Proper monitoring of the product levels must take place to eliminate overfilling. ● Ensure that any petroleum products, such as grease, waste oils and lubricants are contained in containment structures. ● Avoid discharge of pollutants (such as cement, concrete, lime, chemicals, contaminated waste water or leachate) into storm water channels and water courses. ● Equipment and materials to deal with spill cleanup must be readily available on site and staff must be trained as to how to use the equipment and briefed about reporting procedures. ● Develop and implement a groundwater monitoring system and programme, with the aim of monitoring possible contamination to the water resources. ● Groundwater monitoring boreholes installed should be sampled and analyzed periodically. ● Regular tank and pipeline tightness inspections are advised to eliminate the risk of impact on the environment due to leakage. ●The condition of the fuel reticulation system will have to be checked regularly and repaired to prevent leakages.
Proposed Monitoring	● Regular visual inspection
Responsible Party	● Northern Fuel Distributors / Contractors

Surface Water:

Maintenance / Decommissioning phase	
Description	Drainage in the area is well developed. The relief of significant small dry river courses running in the area remain relevant, and contribute well to the drainage of surface run-off in the area. Contaminants in the form of oil leakages, diesel, lubricants and grease from the vehicles, machinery and equipment may occur during maintenance and possible decommissioning activities. Oil spills are known to form a film on water surfaces causing physical damage to organisms. Oxygen transfer could be impaired. Care must be taken to avoid contamination of soils and any surface water bodies in the area.
Proposed Mitigation Measures	● Any spillage of hazardous substances including fuel, oil, paint or cleaning solvent must be cleaned up and disposed of at the designated disposal facility. ● Use drip trays, linings or concrete floors when evidence of leaks are observed on vehicles or equipment. ● Prevent discharge of any pollutants, such as cements, concrete, lime, chemicals, and hydrocarbons into nearby water ways and courses. ● Contain contaminated water from batching operations and allow sediments to settle before being disposed of as waste water. ● Stabilize cleared areas as soon as possible to prevent and control surface erosion. ● Existing ablution facilities at the site should be used. No urinating outside these designated facilities will be allowed. ● 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 construction activities.
Proposed Monitoring	● Regular visual inspection. Surface water quality monitoring in cases of evident pollution.
Responsible Party	● Northern Fuel Distributors / Contractors

Operational Phase	
Description	Spillages might occur during fuel delivery to the above and belowground tanks from road transport tankers. This may also occur during filling of vehicles. Spillages and/or leakages of various possible contaminants might occur due to failure of reticulation pipelines or storage tanks. Contaminated soil might pose a risk to surface water.
Proposed Mitigation Measures	● Proper containment mechanisms installed should be able to contain any spillages that might occur during the operation of the facility. ● All spills should be cleaned up as soon as possible. ● 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 storm water 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.
Proposed Monitoring	● Regular visual inspection. Surface water monitoring sampling for hydrocarbon pollution.
Responsible Party	● Northern Fuel Distributors / Contractors

Air Quality:

Maintenance / Decommissioning phase	
Description	Dust may be produced during maintenance and decommissioning activities; and might be worsened when strong winds occur. These are expected to be site specific and could potentially pose a slight nuisance to the neighboring properties. Possible air pollution in the form of emissions from maintenance vehicles and machinery could also deteriorate air quality in the area.
Proposed Mitigation Measures	● It must be ensured that all vehicles entering the site and machinery used in maintenance and possible decommissioning activities are in good working order to prevent unnecessary emissions. ● Encourage reduction of engine idling at the project site. ● Excavation, handling and transport of materials must be avoided under high wind conditions. ● Dust suppression measures (e.g. dampening with water) may be required from time to time, should dust become a nuisance.
Proposed Monitoring	● Regular visual inspection.
Responsible Party	● Northern Fuel Distributors / Contractors

Operational Phase	
Description	Air quality around the site could be impacted by exhaust fumes from road fuel tankers and vehicles accessing the facility. Hydrocarbon vapors will be released during delivery and dispensing, as liquid displaces the gaseous mixture in the tanks. In terms of fuel storage tanks, the vapors will be released through vent pipes on the tanks.
Proposed Mitigation Measures	● Vehicle idling time shall be minimized by putting up educative signs. ● All venting systems and procedures have to be designed according to SANS standards (SANS 1929:2011) and placed in a sensible manner. ● Vent pipes should be placed in such a manner as to prevent impact on potential receptors. Use vapor recovery equipment and techniques to avoid air pollution and minimize fuel loss.
Proposed Monitoring	● Regular air quality monitoring to be conducted at the facility. A complaints register regarding emissions/smell should be kept and acted on if it becomes a regular complaint.
Responsible Party	● Northern Fuel Distributors / Contractors

Health and Safety:

	Maintenance / Decommissioning phase
Description	Safety issues could arise from the vehicles, equipment, tools and personal during construction, maintenance and possible decommissioning activities. This increase the possibility of injuries and the contractor must ensure that all staff members are made aware of the potential risks of injuries on site.
Proposed Mitigation Measures	● All vehicles, equipment and tool operators shall be equipped with proper and adequate personal protective equipment gear. ● Maintenance operations should be strictly between 07H00 to 17H00. First aid and safety awareness training for contractors. ● Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises. ● The facility must be properly fenced off to prevent unauthorized persons from accessing the site, who could get injured on site.
Proposed Monitoring	● Safety procedures evaluation. Health and safety incident monitoring.
Responsible Party	● Northern Fuel Distributors / Contractors

Operational Phase	
Description	The operations of the fuel storage facility can cause health and safety risks to workers on site. Occupational exposures are normally related to inhalation of fuel vapors and physical contact with fuels.
Proposed Mitigation Measures	● Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises. ● All personnel and operators at the fuel site must be properly trained on safety and health issues of the facility. ● Well stocked first aid box which is readily available and accessible should be provided within premises. ● Emergency signs must be prominently displayed at the premises. ● Workers should be fully equipped with personal protective equipment gear.
Proposed Monitoring	● Regular inspection and incident monitoring report evaluation.
Responsible Party	● Northern Fuel Distributors / Contractors

Noise Pollution:

	Maintenance / Decommissioning phase
Description	Noise pollution exists due to vehicle frequenting the site. Vehicles and equipment will be utilized during maintenance and possible decommissioning activities and noise would be generated. It is expected that the noise generated will not have a significant impact on any third parties.
Proposed Mitigation Measures	● Sensitize vehicle and machinery operators to switch off engines of vehicles or machinery not being used. ● Ensure vehicles and equipment to be used at the facility are fitted with mufflers. ● Equipment and machinery operators should be equipped with ear protection equipment. ● Audio equipment (if any) should not be played at levels considered intrusive by others. ● Operations should be strictly between 07H00 to 17H00.
Proposed Monitoring	● Strict operational times. Regular inspection.
Responsible Party	● Northern Fuel Distributors / Contractors

	Operational Phase
Description	Noise pollution may be generated by vehicles, trucks and people frequenting the site.
Proposed Mitigation Measures	● Delivery of fuel products by road tankers should be limited to normal working hours (07H00 to 17H00). ● Loud music from any vehicles accessing the site should be restricted. ● Maintain the grievance mechanism to capture public perceptions and complaints with regard to noise impacts, track investigation actions and introduce corrective measures for continuous improvement.
Proposed Monitoring	● Strict delivery and collection times.
Responsible Party	● Northern Fuel Distributors / Contractors

Waste Generation:

	Maintenance / Decommissioning phase
Description	This can be in a form of contaminated soil, building rubble, pipe cuttings, electrical cuttings, oil spills or leakages of petroleum products.
Proposed Mitigation Measures	● Ensure that no excavated soil, refuse or building rubble generated on site are placed, dumped or deposited on adjacent/surrounding properties or land. ● Ensure that sufficient weather-proof bins/containers are present at the facility for the disposal of waste. ● The contractor shall institute a waste control and removal system for the site. All waste shall be disposed of site at an approved landfill site. ● No burning and/or burying of waste on site shall be allowed. ●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. ● Existing ablution facilities at site shall be used by all contractors. No urinating outside these designated facilities.
Proposed Monitoring	● Regular inspection and housekeeping procedure monitoring. Observation of site appearance.
Responsible Party	● Northern Fuel Distributors / Contractors

Operational Phase	
Description	Waste such as contaminated soil, litter, empty drums and cans of petroleum product will be generated during the operational phase.
Proposed Mitigation Measures	● Contaminated soil must be removed and disposed of at a suitable waste disposal site. ● Waste bins must be available at the fuel storage facility at all times. Waste must be appropriately collected and disposed of at an approved waste disposal site. ● Oil-water separator effluent originating from storm water runoff, tank bottoms and washing activities should be separated before disposal of the water. ● Regular monitoring of the oil-water separator outflow must be conducted. Water containing soaps and other detergents must not enter the oil water separator as it will place the hydrocarbons in suspension, rendering the oil water separator ineffective. ● Care should be taken when handling contaminated material. The cradle to grave principal should be kept in mind during waste disposal. ● Any non-biodegradable hazardous material (i.e. oil cans and containers etc.) generated should be properly stored in containment structures, collected and transported to the nearest approved hazardous waste disposal facility.
Proposed Monitoring	● Regular visual inspection. Containment area inspections and monitoring of the oil/waste separators.
Responsible Party	● Northern Fuel Distributors / Contractors

Traffic:

Operational Phase	
Description	The site is situated in a low traffic area, slow traffic (trucks) frequenting the facility may become a nuisance to motorists accessing neighboring properties.
Proposed Mitigation Measures	● Delivery of fuel products by road tankers should be limited to normal working hours (07H00 to 17H00).
Proposed Monitoring	● Strict delivery times monitoring.
Responsible Party	● Northern Fuel Distributors / Contractors

Ecological impacts:

Maintenance / Decommissioning phase	
Description	The site is within an urban setting and entirely build-up. No known conservation worthy vegetation exists at the facility.
Proposed Mitigation Measures	● Disturbance of areas outside the designated boundary of the fuel site is not allowed. ● No vegetation should be removed outside the designated fuel site area.
Proposed Monitoring	● Regular site inspection.
Responsible Party	● Northern Fuel Distributors / Contractors

Operational Phase	
Description	The proposed facility operations will have minimal impacts on fauna and flora.
Proposed Mitigation Measures	● The operational activities would not exceed the demarcated area of the fuel storage facility.
Proposed Monitoring	● Regular site inspection
Responsible Party	● Northern Fuel Distributors / Contractors

Overfilling of Tanks:

Operational Phase	
Description	Overfilling of aboveground storage tanks may take place.
Proposed Mitigation Measures	● This impact can be reduced by the installation of proper spill containment systems around the storage tanks. ● Proper training of the operators. ● Strictly adhere to offloading procedures. ● Proper monitoring of the product levels in tanks.
Proposed Monitoring	● Regular inspection of the fuel level on tanks.
Responsible Party	● Northern Fuel Distributors / Contractors

Fire and Explosion:

Operational Phase	
Description	Hydrocarbons are volatile under certain conditions and their vapors in specific concentrations and conditions are flammable.
Proposed Mitigation Measures	● There should be sufficient water available for firefighting purposes. ● Ensure that all fire-fighting devices are in good working order and they are serviced. ● All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site.
Proposed Monitoring	● Regular inspections and testing on firefighting equipment.
Responsible Party	● Northern Fuel Distributors.

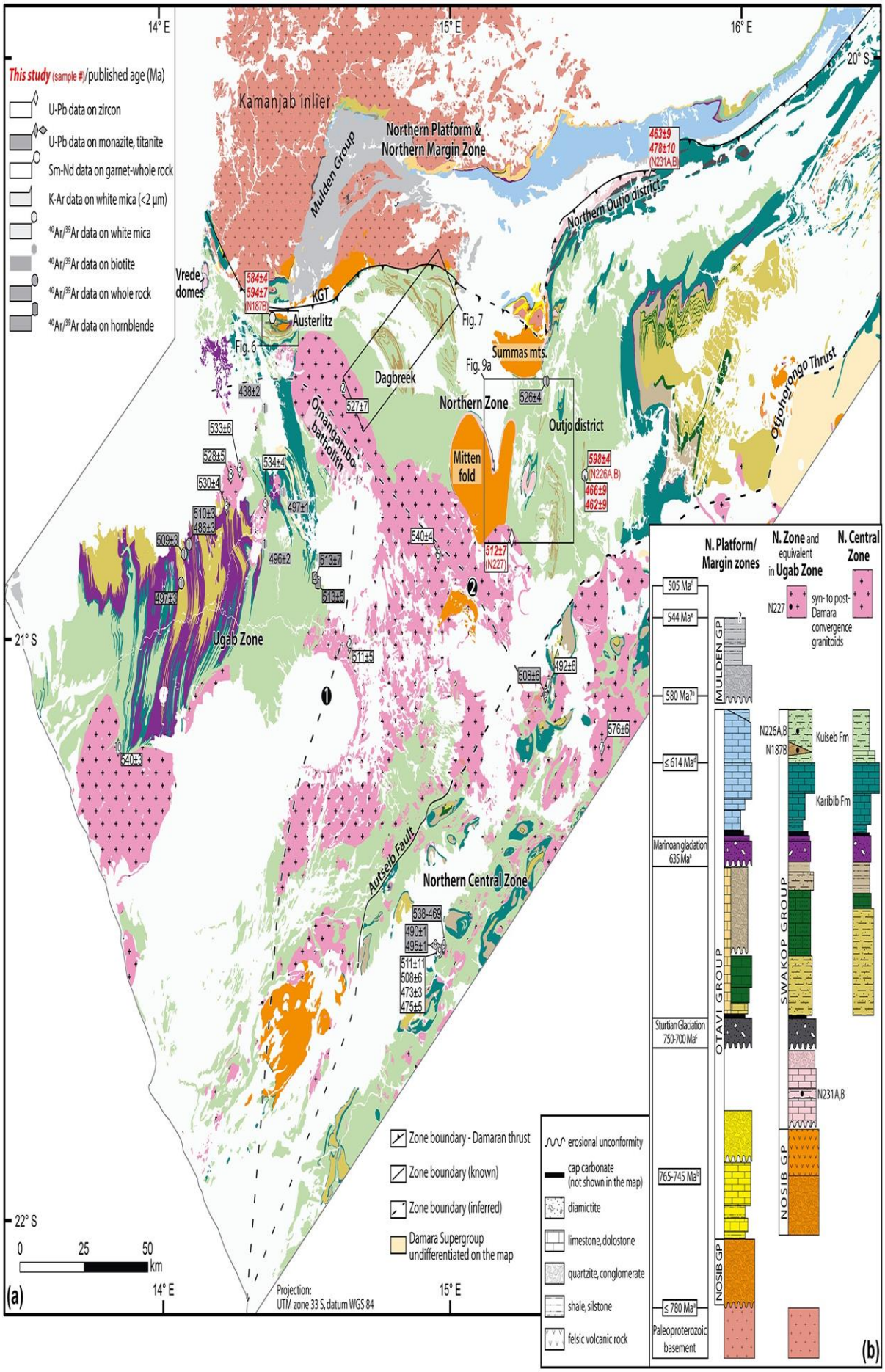
5. Geology, Hydrogeology of the study Area

The average annual temperatures in the Outjo area are 20qC - 22qC (Mendelsohn et al., 2003). Temperatures in the Outjo area can reach a maximum of 32qC - 34qC. The average minimum temperature in the area ranges between 6qC and 8qC. The average rainfall of the area ranges between 300 mm to 350 mm per annum (Mendelsohn et al., 2003). Predominant wind direction is from north to east , with average wind speeds between 1 and 7 meters per second, while 21.4% of the year there is no wind

Outjo is located within the trees and shrubs biome, with the vegetation types dominated by mopane and thorn bush woodland (Mendelsohn et al., 2003). The vegetation structure in the proposed area includes sparse and dense shrubland and woodland types. There is a spatial and temporal vegetation distribution across the Outjo region, which is mainly driven by climatic, topographic and underlying bedrock. Large sensitive trees such as Combretum imberbe, Colophospermum mopane and Ficus sycomorous can be found in some of this areas

The area supports a medium-high terrestrial diversity of animal and plant life, with the plant diversity in the area supporting approximately 300 – 399 species (Mendelsohn et al., 2003)

The local geology of Outjo district generally comprises units of the Epupa, Huab and Abbabis Metamorphic Complexes along the northern boundary, Otavi in the central section and Swakop Group along the southern boundary. The Otavi Group forms part of the Carbonate Platform of the Damara Orogen which comprises a thick sequence of late Proterozoic to early Phanerozoic (1000 to 541 Million) Otavi Group carbonates, argillaceous and siliciclastic rocks, deposited upon basement rocks


This study (sample #)/published age (Ma)
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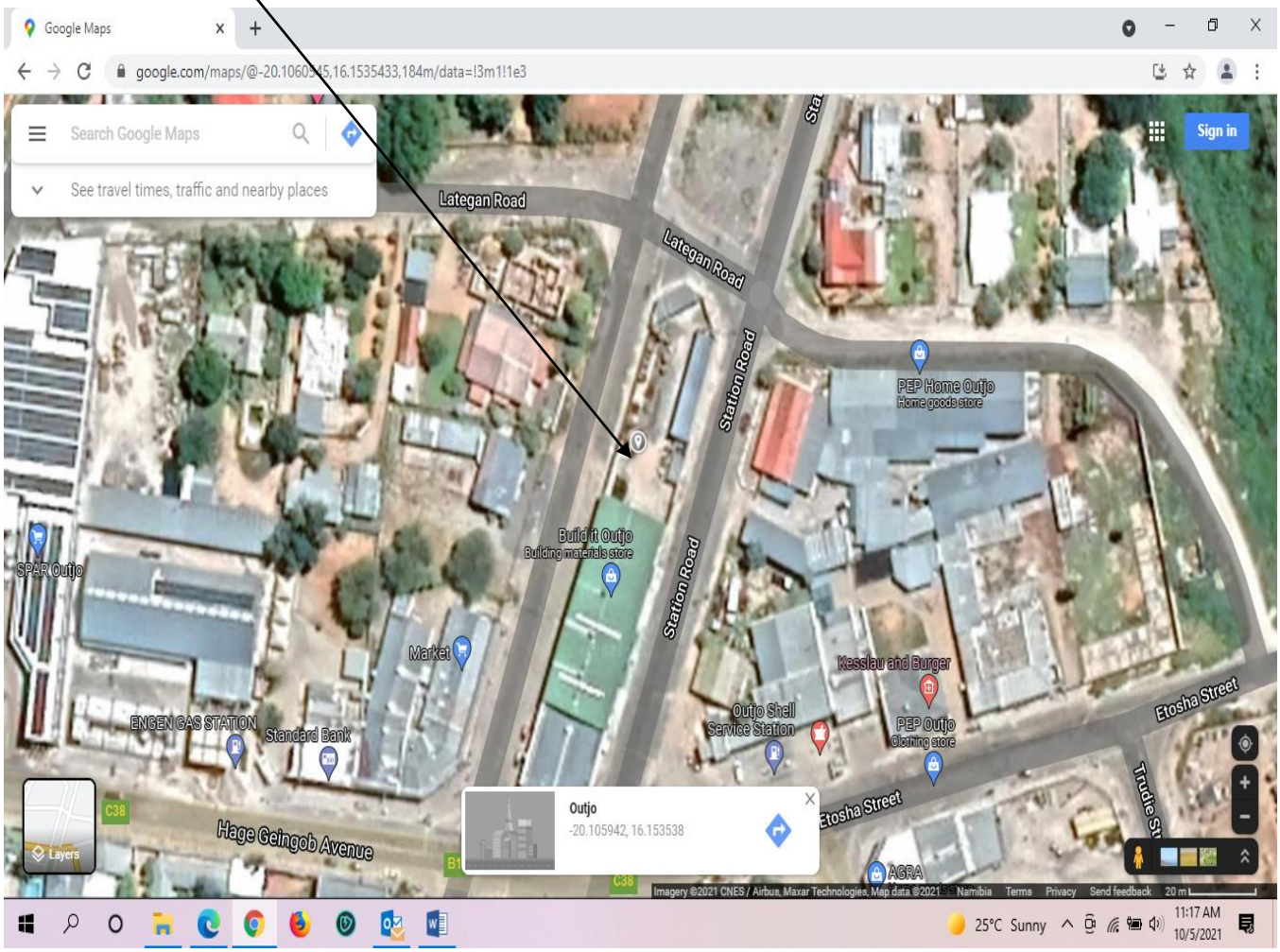
Sm-Nd data on garnet-whole rock
K-Ar data on white mica (<2 µm)
40Ar/39Ar data on white mica
40Ar/39Ar data on biotite
40Ar/39Ar data on whole rock
40Ar/39Ar data on hornblende
14° E
15° E
16° E
20° S
21° S
22° S
Kamanjab inlier
Mulden Group
Northern Platform & Northern Margin Zone
Northern Outjo district
Vrede domes
KGT
Austerlitz
Fig. 6
Fig. 7
Fig. 9a
Summas mts.
Dagbreek
Northern Zone
Outjo district
Otjohorongo Thrust
Omangambo batholith
Mitten fold
Ugab Zone
Autseib Fault
Northern Central Zone
584±4
594±7
(N187B)
463±9
478±10
(N231A,B)
598±4
(N226A,B)
466±9
462±9
512±7
(N227)
438±2
527±7
526±4
533±6
528±5
530±4
534±4
497±1
510±3
486±3
509±3
497±3
496±2
513±7
513±5
540±4
511±5
492±8
508±6
576±6
540±3
538-469
490±1
495±1
511±11
508±6
473±3
475±5
Zone boundary - Damaran thrust
Zone boundary (known)
Zone boundary (inferred)
Damara Supergroup undifferentiated on the map
0
25
50
km
Projection: UTM zone 33 S, datum WGS 84
(a)
erosional unconformity
cap carbonate (not shown in the map)
diamictite
limestone, dolostone
quartzite, conglomerate
shale, siltstone
felsic volcanic rock
N. Platform/ Margin zones
N. Zone and equivalent in Ugab Zone
N. Central Zone
505 Ma[f]
544 Ma[e]
580 Ma?[b]
≤ 614 Ma[d]
Marinoan glaciation 635 Ma[a]
Sturtian Glaciation 750-700 Ma[c]
765-745 Ma[b]
≤ 780 Ma[b]
Paleoproterozoic basement
MULDEN GP
OTAVI GROUP
NOSIB GP
SWAKOP GROUP
N227
syn- to post-Damara convergence granitoids
N226A,B
N187B
Kuiseb Fm
Karibib Fm
N231A,B
(b)

Outjo is located in the Ugab-Huab basin which has a predominantly productive fractured aquifer with some parts of the area being moderately productive but viable aquifer. The proposed project lies in a rocky and hilly area with the elevation profile (west - east) ranging between 1200 m -1500 m, the dendritic drainage patterns indicate this sloping characteristics. Ground water is used predominantly for domestic purposes, subsistence farming, and small-scale and largescale commercial farming. There are numerous boreholes scattered across the Outjo District. Given the nature and scale of the proposed exploration, drilling is unlikely to impact ground water. Additionally, the number and wide spread of the existing boreholes, could potentially be used to source water for the project, with permission from the relevant farm owner

Site Location



6. Conclusions

If the above mentioned management recommendations are properly implemented, it is anticipated that most of the adverse impacts on the environment can be mitigated. An appointed environmental control officer will need to monitor or audit the site throughout operation to ensure that the EMP is fully implemented and complied with. The EMP caters for operational and maintenance phases (including possible decommissioning), but will need to be reviewed during all phases of the project, especially when revisions are made to the development and/or operations of the facility.

The Environmental Management Plan should be used as an on-site tool during all phases of the development. Parties responsible for contravention of the EMP should be held responsible for any rehabilitation that may need to be undertaken.

Clearance certificates issued on EMP's are only valid for 3 years and will need to be reviewed and submitted to the Department of Environmental Affairs for approval.

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Martin van Wyk
Retail Coordinator / ECO