Environmental Impact Assessment (EIA) Study: Scoping Report

The Existing and New Proposed Borrow Pits for the Upgrading of DR3645 (16.3km: Engoyi to Omuntele) to Low Volume Seal (LVS) standards in the Oshikoto Region - Application for Environmental Clearance Certificate (ECC)

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SAFE ROADS TO PROSPERITY

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SERJA' STATEMENT OF INDEPENDENCE

As the Appointed Environmental Consultant to undertake the EIA Study for the Existing and New Proposed Borrow Pits for the Upgrading of DR3645 (16.3km: Engoyi to Omuntele) to Low Volume Seal (LVS) standards in the Oshikoto Region, Serja Hydrogeo-Environmental Consultants declare that we:

- do not have, to our knowledge, any information or relationship with Roads Authority of Namibia (the Proponent), the road construction contractor (RCC) nor the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF) that may reasonably have potential of influencing the outcome of this Environmental Assessment and the subsequent Environmental Clearance Certificate (ECC) applied for.
- have knowledge of and experience in conducting environmental assessments, the Environmental Management Act (EMA) No. 7 of 2007 and its 2012 Environmental Impact Assessment (EIA) Regulation as well as other relevant national and international legislation, guidelines, policies, and standards that govern the project activities as presented herein.
- have performed work related to the ECC application in an objective manner, even if the results in views and findings or some of these may not be favourable to the Proponent.
- have complied with the EMA and other relevant regulations, guidelines and other applicable laws as listed in this document.
- declare that we do not have and will not have any involvement or financial interest in the undertaking/implementation of the project activities, other than remuneration (professional fees) for work performed to conduct the EIA and apply for the ECC in terms of the EIA Regulations' requirement as an Environmental Assessment Practitioner (EAP).

Disclaimer: Serja Hydrogeo-Environmental Consultants will not be held responsible for any omissions and inconsistencies that may result from information that was not available at the time this document was prepared and submitted for evaluation.

……

Signature:

Fredrika N. Shagama: Principal Environmental Assessment Practitioner & Hydrogeologist

Date: 31 July 2024

EXECUTIVE SUMMARY

Roads Authority (RA) of Namibia (hereinafter referred to as the Proponent) through the appointed contractor (Roads Contractor Company (RCC)) is currently upgrading the existing 16.3km District Road 3645 (DR3645): Engoyi-Omuntele to low volume seal (LVS) standards in the Oshikoto Region (the Project). The road was constructed in 2007 using labour-based methods and now being upgrading from gravel to tarred road (LVS). As part of the road upgrading works, the contractor requires construction materials which is sourced from borrow pits located along the road route. There are currently four existing borrow pits from 2007/2008 that require extension to continue providing materials for the road upgrade and an additional of three new proposed sites for new borrow pits. The seven borrow pits (BPs) currently identified and utilized are as follows are BP 6 (potential site), BP 8A (existing to be extended), BP 8B (new site), BP 12 (new site), BP 15 RHS (existing to be extended), BP 15 LHS (existing to be extended) and BP 31 (for extension into a new adjacent site).

Project Activities

The project activities involve the upgrading of the DR3645 from gravel to low volume seal (LVS) standard by the Roads Contractor Company (the appointed construction contractor) under the supervision of Burmeister & Partners (Pty) Ltd Consulting Engineers. The work has been ongoing since 01 October 2023 and completion of works is anticipated for 26 October 2024.

To complete the road upgrading works, there is a need to expand the existing four borrow pits and open up three more borrow pits to supply the project with construction materials (sand and gravel) which is the core purpose of this EIA Study. The initial exploration for borrow pits was carried out back in 2006/2007 (for existing BPs) and the new and potential sites was done recently and possibly continuing to supply the road works. To minimize haul costs, BPs are ideally spaced approximately 5km apart for selected sub-grade materials and 10km apart for sub-base and base materials as far as practicable.

Communication with I&APs, and Means of Consultation Employed

Communication with I&APs with regards to the project activities was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the project activities was compiled, uploaded on the MEFT (ECC) Portal for project registration and shared with registered stakeholders / Interested and Affected parties (I&APs).
- A Stakeholders' (I&AP) List was developed and updated as new I&APs register for the EIA. One hundred and twenty (120) I&APs were registered for the EIA Study. The BID was shared with pre-identified key stakeholders such as the Oshikoto Regional Council (including Onyaanya and Omuntele constituencies), ministries such as Urban & Rural Development, Works & Transport, MEFT's Forestry Directorate, etc.

- Project EIA notices were published in the following newspapers:
    - *New Era*: The notice appeared in the newspaper on the 14th and 21st of June 2024.
    - *Windhoek Observer*: The notice appeared on the 13th, 18th and 21st of June 2024. The consultation period ran from the 13th of June to the 12th of July 2024.
- EIA notices in both English and Oshiwambo languages were prepared for printing in A3 size posters that were pasted at selected points/places along the DR3645, including the constituency offices.
- Consultation meetings were scheduled and held with the community and local stakeholders (in the area from 03 July to 04 July 2024. The meeting in Onamutayi (Onamutenya Area) had 48 attendees, Omuntele 16 attendees, Ondjamba 14 attendees and Engoyi had 14 attendees. The number of attendees includes 3 Serja HGE Consultants and one representative from RCC. The minutes were taken from all the meeting and attendance registers were signed and filed.

Feedback on the Review of the Draft Scoping Report and EMRP: The draft environmental Scoping Report, environmental management & rehabilitation plan (EMRP) and minutes from the consultation meetings were circulated to the registered stakeholders and I&APs for review and comments on the 22nd of July to the 30th of July 2024. There were no comments received on the documents.

Concluding remark on stakeholder and public consultation: The comments and issues raised during the consultation period were significant, however, they were submitted as objections that would hinder, halt or terminate the project activities. The stakeholders and I&APs would just like to see improvements made where the project activities are lagging in terms of environmental and social sustainability. More importantly, the I&APs would like to see the implementation of management and mitigation measures to reduce the significance of the impacts while continuing with the road construction works because they need the road to improve their mobility and accessibility to economic and social services centers.

Potential identified positive and adverse (negative) impacts if borrow pits

Positive impacts (although temporary):

- Socio-economic development through temporary job (employment) creation in the area during the road upgrading phase to over 100 people.
- Procurement of local goods and services by small and medium businesses to promote local entrepreneurship empowerment and local economic development.
- The rehabilitated borrow pits can be used as rainwater holding (storage) structures for the community (this was requested by the community during consultation meetings in 2006/2007).

The ultimate long-term benefits of the upgraded road will include:

- Improved accessibility: better roads connections enhance accessibility to remote rural areas, facilitating transportation of goods and services, and access to healthcare and education centres.
- Economic development: better roads can stimulate economic growth by attracting investment, promoting tourism, and facilitating the movement of goods and people.
- Safety: upgraded roads with improved design and signage can enhance road safety, reducing the risk of accidents and fatalities.
- Social cohesion: improved connectivity through upgraded roads can strengthen social ties within rural communities by enabling easier access to markets, schools, and healthcare centres and other social services.

Potential environmental and social (adverse) impacts of borrow pits:

- Displacement of properties and or loss of productive to create borrow pits for road upgrade.
- Habitat destruction: Excavation of borrow pits can lead to the destruction of natural habitats for plants and animals.
- Soil erosion: The removal of large amounts of soil and vegetation from borrow pits can increase the risk of soil erosion, especially during rainfall events.
- Lowering of the local groundwater table: Excavation activities may affect the local water table, leading to changes in groundwater levels, thus, affecting water availability to vegetation.
- Noise associated with borrow pits from heavy machinery and trucks can disturb locals and animals.
- Occupational and community health and safety risks: The handling of machinery and equipment by workers at the borrow pits may result into injuries and if worse, can lead to fatalities on duty. The curiosity of local children may force them to go and play with unattended heavy trucks and big machinery at borrow pit sites near their homes. The unfenced, and un-rehabilitated and deep and steep-sided borrow pits can be a hazard to the communities (people and livestock).
- Impact on air quality: dust and particulate matter generated during excavation of materials (sand and gravel) and transportation can compromise air quality in the surrounding area.
- Disruption of hydrological systems: borrow pits can alter natural drainage patterns, causing changes in surface water flow and potentially exacerbating flooding or drought conditions.
- Land use change: the conversion of natural landscapes into borrow pits can permanently alter landscapes, affecting the aesthetic value of the area.
- Archaeological or cultural heritage impact: the borrow pits may impact local cultural heritage sites or traditional land use practices, potentially leading to social tensions or conflicts.

Key environmental and social issues raised and observed

In addition to the pre-identified impacts before the consultation meetings and site visit, key issues raised and observed during the consultation process (emails, consultation meetings and observations made by the environmental assessment practitioner / consultant in the field) are as follows:

- The loss of floral species (the removal of protected trees) and permitting requirements
- Soil conservation owing to physical disturbance (borrow pits activities)
- Rehabilitation of old/existing as well as new borrow pits
- The need for social responsibility related to borrow pits (for community use as rainwater holding structures/dams for livestock)
- Recruitment of project personnel (labourers)
- Damaging of local / community access roads
- Air quality and visual (dust generation)
- Observed issues in the field
- Community safety at or near BPs and the DR3645 itself
- The issue hauling and loading operators being alone at BPs
- Damaging of community water pipeline across the road due to construction works
- Over speeding by project truck drivers
- Lack of PPE for some SME workers in the field.

These comments and issues were addressed and incorporated into this Report and Draft EMP.

Some key potential positive and negative impacts were identified by the Environmental Consultant and based on issues raised by I&APs during the consultation period. The issues raised by I&APs were addressed and incorporated into this Report whereby mitigation measures have been provided in the Environmental Management & Rehabilitation Plant (EMRP for implementation to avoid and/or minimize their significance on the environmental and social components.

Impact Assessment: The key negative impacts were described, assessed. The potential negative impacts indicated a medium rating significance. To minimize the significance, appropriate management and mitigation measures made thereof for implementation by the Proponent, their contractors, and workers to avoid and/or minimize their significance on the environmental and social components. The effective implementation of the recommended management and mitigation measures accompanied by monitoring will particularly see the reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low).

Recommendations and Conclusions

The EIA Study was deemed sufficient and concluded that no further detailed assessments are required to the ECC application for the road construction borrow pits.

Serja Consultants are confident that the potential negative impacts associated with the project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures and with more effort and commitment put on monitoring the implementation of these measures. It is therefore, recommended that the borrow pits be granted an ECC, and provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.
- All required permits, licenses and approvals for the activities are obtained as required. These include permits and licenses and ensuring compliance with these specific legal requirements.
- Transparency in communication and continued engagement with the communities and or through their leaders (local leaders / headmen), and stakeholders should be maintained throughout the project cycle.
- The Proponent, their project workers and contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by issuing authorities.
- Site areas where excavations were carried out and have ceased are rehabilitated, as far as practicable, to their pre-excavation state. This includes the levelling of stockpiled topsoil, backfilling trenches and closing/capping of project associated holes.
- The EMRP implementation should be checked and done by the responsible team member onsite (Environmental Control Officer / Safety Officer) and audited by an Independent Environmental Consultant on a bi-Annual basis to compile Environmental Monitoring (audit) reports. These reports are to be submitted to the Environmental Commissioner at the DEAF – This will be required by the Environmental Commissioner (as part of the ECC conditions).

In conclusion, although significant, the identified impacts would not hinder the project activities. However, the recommended measures should be effectively implemented and monitored to ensure that the significance of adverse impacts is reduced to low where it is medium and eventually to negligible significance rating. The effectiveness of the implementation of the management and mitigation measures and EMP compliance will be done by an Environmental Control Officer (ECO) or Safety Officer and audited by an Independent Environmental Consultant on a bi-annual basis. This is to ensure that EMRP implementation can be tracked via Bi-Annual Environmental Monitoring exercises and documented in the monitoring reports to the Environmental Commissioner. The monitoring of EMP implementation will not only be done to ensure that the impacts significance is reducing and or maintain low significance rating but to also ensure that all potential unforeseen impacts that might arise during implementation are properly identified in time and addressed immediately.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
BID	Background Information Document
BP	Borrow Pit
BP 15 LHS	Borrow Pit 15 on the left-hand side
BP 15 RHS	Borrow Pit 15 on the right-hand side
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CSR	Corporate Social Responsibility
DEAF	Department of Environmental Affairs and Forestry
DR	District road
EAP	Environmental Assessment Practitioner

Abbreviation	Meaning
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GG	Government Gazette
GN	Government Notice
I&APs	Interested and Affected Parties
IFC	International Finance Corporation
LVS	Low Volume Standard
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
NHC	National Heritage Council (NHC) of Namibia
NORED	Northern Namibia's Regional Electricity Distributor
OTA	Ondonga Traditional Authority
PPE	Personal Protective Equipment
RA	Roads Authority of Namibia
RCC	Roads Contractor Company
Reg, S	Regulation, Section
SME	Small and medium-sized enterprise
UNCCD	The United Nations Convention to Combat Desertification

GLOSSARY (KEY TERMS)

Term	Definition
Alternative	A possible course of action, in place of another that would meet the same purpose and need of the proposal.
Baseline	Work done to collect and interpret information on the condition/trends of the existing environment.

Term	Definition
Biophysical	The part of the environment that does not originate with human activities (e.g., biological, physical and chemical processes).
Borrow Pit	Literal pits dug to provide fill material, such as sand and gravel for construction projects.
Cumulative Impacts / Effects Assessment	In relation to an activity, means the impact of an activity that in it 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.
Decision-maker	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal
Ecological Processes	Processes which play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of evolution).
Environment	As defined in Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water, and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.
Environmental Management Plan (Draft EMP)	As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environments effects are to be mitigated, controlled, and monitored.
Interested and Affected Party (I&AP)	In relation to the assessment of a listed activity includes - (a) any person, group of persons or organization interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity.
Fauna and Flora	The animals and plants found in an area.
Mitigate	Practical measures to reduce adverse impacts.
Mitigation	The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of an action on the affected environment
Monitoring	Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).

Term	Definition
Proponent	Organization (private or public sector) or individual intending to implement a development proposal. As defined in the Environmental Management Act, the Proponent is a person who proposes to undertake a listed activity. The Proponent in this case is Roads Authority of Namibia.
Public Consultation/Involvement	A range of techniques that can be used to inform, consult or interact with stakeholders affected by the proposed/project activities.
Protected Area	Refers to a protected area that is proclaimed in the Government Gazette according to the Nature Conservation Ordinance number 4 of 1975, as amended.
Scoping	An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. Can, also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of site and surroundings, and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into full EIA.
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

1 INTRODUCTION

1.1 Project Background and Location

Roads Authority (RA) of Namibia (hereinafter referred to as the Proponent) through the appointed contractor (Roads Contractor Company (RCC)) is currently upgrading the existing 16.3km District Road 3645 (DR3645): Engoyi-Omuntele to low volume seal (LVS) standards in the Oshikoto Region (*the Project*). The road was constructed in 2007 using labour-based methods and now being upgrading from gravel to tarred road (LVS). As part of the road upgrading works, the contractor requires construction materials which is sourced from borrow pits located along the road route as shown on the locality map in Figure 1-1. There are currently four existing borrow pits from 2007/2008 that require extension to continue providing materials for the road upgrade and an additional of three new proposed sites for new borrow pits. The seven borrow pits (BPs) currently identified and utilized are as follows (please refer to the locality map):

1. BP 6 (potential site)
2. BP 8A (existing to be extended)
3. BP 8B (new site)
4. BP 12 (new site)
5. BP 15 RHS (existing to be extended)
6. BP 15 LHS (existing to be extended)
7. BP 31 (existing to be extended into a new adjacent site)

The initial portion of the road from Engoyi to Omuntele is a gravel surfaced road in a poor condition. Thus, upgrading is necessary to upgrade to an all-weather two-lane single carriageway to low volume seal standard which will serve the purpose to:

- Improve rural and regional accessibility,
- Reduction of road user costs,
- Reduction of travel times, and
- Improve access to services such as schools and health centres as well as economic centres.

The extent of the associated disturbance of properties due to the road upgrading works such as fences, fields has been determined and compensations have been made accordingly.

The project will involve inter alia the following:

- Upgrading to LVS standards of the roadway,
- Provision of and Improvement of drainage facilities and features,
- Upgrading of intersections along the route, and
- Installation of road furniture, and establishment of the 30m road reserve.

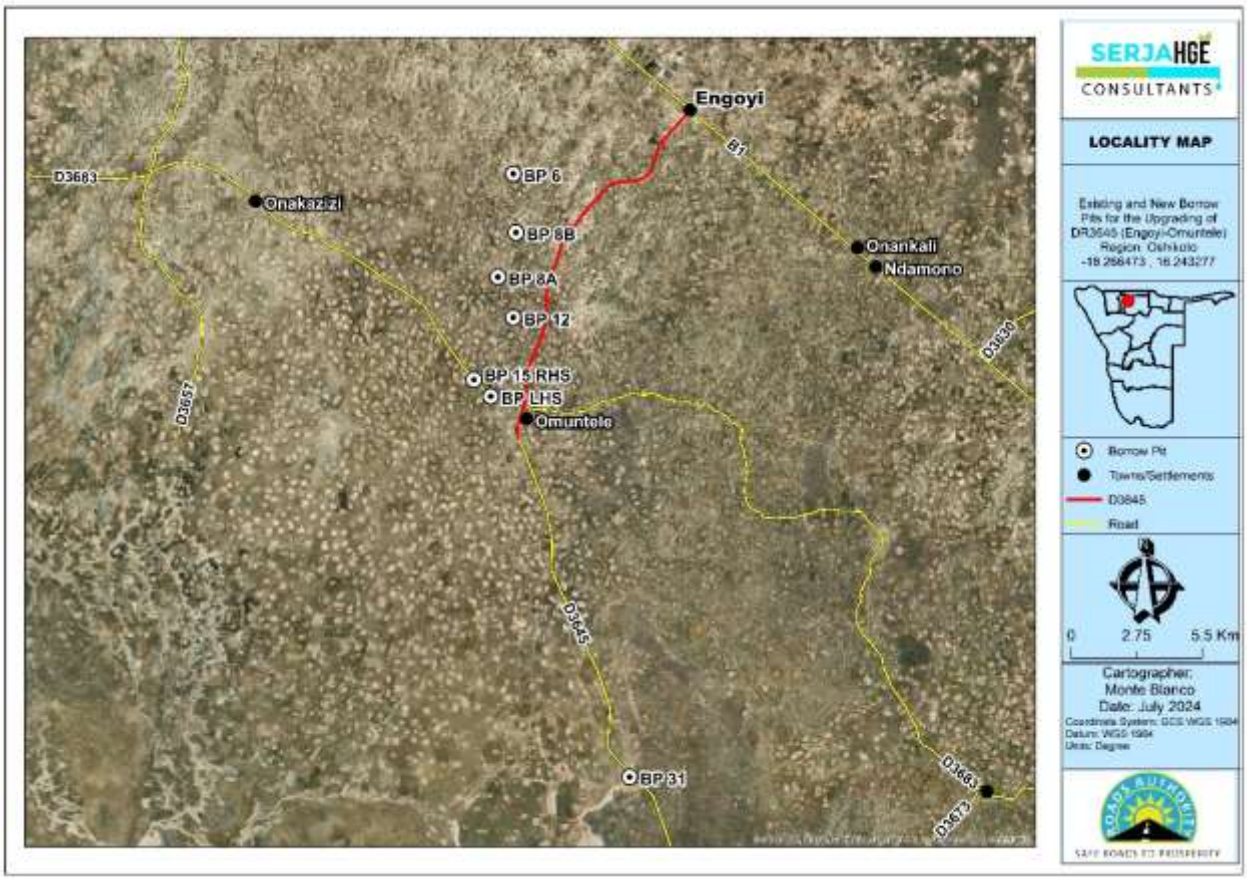


Figure 1-1: Locality map of the borrow pits along the DR3645 (Engoyi-Omuntele) in Oshikoto Region

The road and its associated BPs are in six villages (Okanyowa, Opembelonga, Okandombe, Okwandja, Elonga and Onamutayi) that fall within the jurisdiction of the Ondonga Traditional Authority (OTA). The GPS coordinates of the BPs and villages where they are found in are presented in Table 1-1 below.

Table 1-1: The GPS coordinates of the 7 BP sites and their hosting villages

Borrow Pit (BP) No.	Borrow Pit (BP) ID and comment, if any	Location / Village	GPS Coordinates
1.	BP 6 (potential)	Okanyowa	18°08′52.77″S 16°14′06.87″E
2.	BP 8A (existing/extension) – the material is depleted and salty. Thus, it is awaiting rehabilitation	Elonga	18°11′13″S 16°13′46″E
3.	BP 8B (New) – awaiting rehabilitation (the material is depleted, thus, no further use)	Opembelonga	18°10′12.55″S 16°14′10.51″E
4.	BP 12 (new)	Okwandja	18°12′11.8″S 16°14′06.97″E

Borrow Pit (BP) No.	Borrow Pit (BP) ID and comment, if any	Location / Village	GPS Coordinates
5.	BP 15 RHS (existing/extension):	Okwandja	18°13′32.62″S 16°13′18.44″E
6.	BP 15 LHS (existing/extension)	Okandombe	18°13′55.2″S 16°13′36.36″E
7.	BP 31 (existing/extension	Onamutayi	18°22′32.63″S 16°16′45.4″E

The road works (DR3645) and associated activities fall under the electoral constituencies, namely Onyaanya and Omuntele, with six of the seven BPs falling under Omuntele Constituency and BP 6 found at the borders of the two constituencies as shown in Figure 1-2.

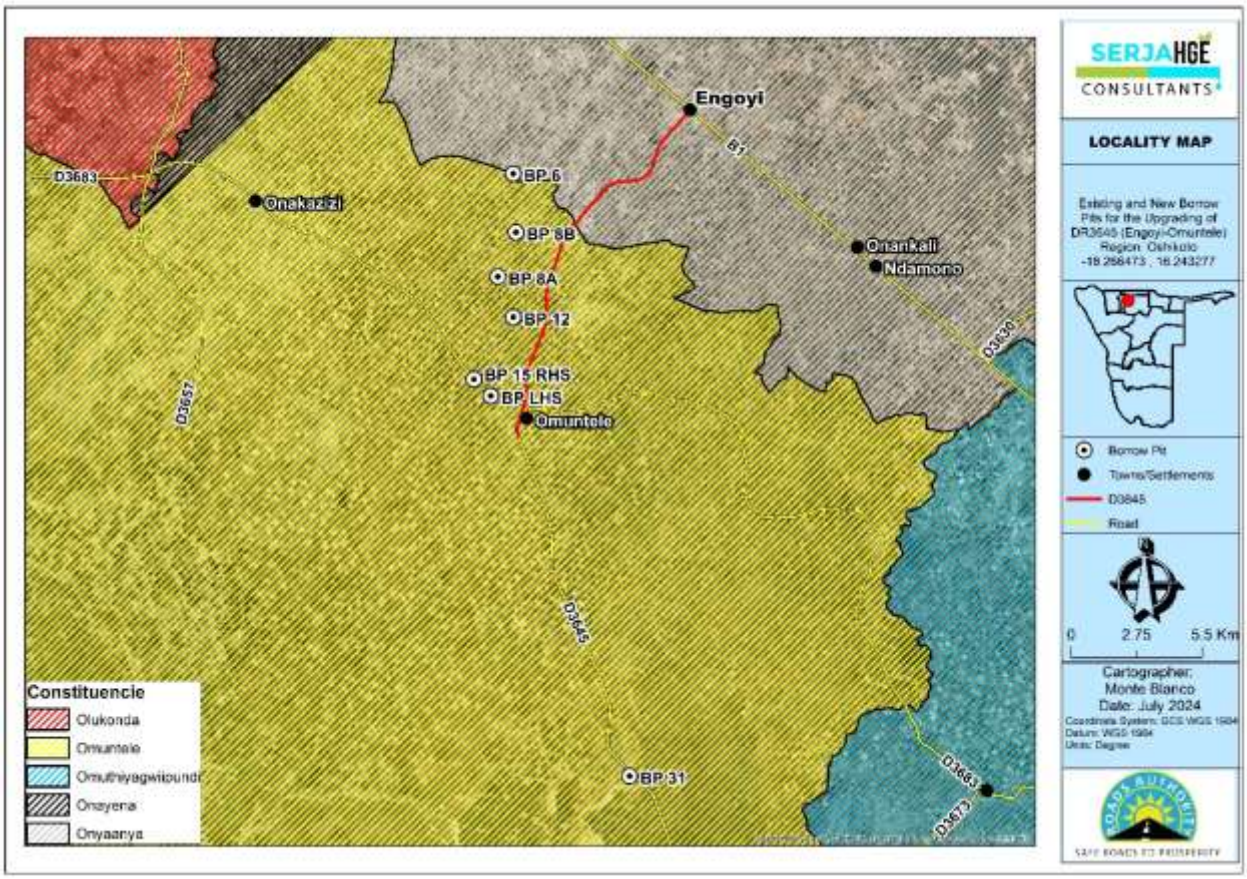


Figure 1-2: The locations of the BPs in relation to the electoral constituencies

1.2 The Need and Desirability of the Project Activities

The DR3645 which starts from Engoyi to Omuntele follows a north-easterly - south-westerly direction. The 16.3km DR3645 will efficiently serve the areas along the route, thus providing improved and better access to health centres, schools and public services (growth centres) along the route. The project (road upgrade) will also serve economic activities along the road. Furthermore, the upgrading of the road will ease the access of locals and travelers alike to services, local farmers to transport their farm produce to the market centres such as Ondangwa, Omuthiya and other towns/villages and settlements with ease.

The road upgrade will also address the erosion aspects through the drainage systems, crossing structures as well as providing additional structures where applicable.

1.3 Need for an Environmental Clearance Certificate for the Borrow Pits

The roads construction or upgrading and associated works such as excavation of borrow pits to supply the road construction works is one of the listed activities in the Environmental Impact Assessment (EIA) Regulations (2012) of the Environmental Management Act (EMA) No. 7 of 2007 that may not be undertaken without an Environmental Clearance Certificate (ECC). The listed activities that are relevant to the project activities are as follows:

- *Listed Activity 10.2 the construction of - the route determination of roads and design of associated physical infrastructure where - (a) it is a public road, (b) the road reserve is wider than 30 meters; or (c) the road caters for more than one lane of traffic in both directions*

Associated activities: Mining and Quarrying Activities for sand and gravel from borrow pits

- *Listed Activity 3.1 The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
- *Listed Activity 3.2 other forms of mining or extraction of any natural resources whether regulated by law or not.*

The purpose of the EIA Study and subsequent issuance of the ECC is therefore to ensure that the project activities are undertaken in an environmentally & socially friendly and sustainably manner, through the effective implementations of recommended environmental management measures to minimize the adverse identified impacts while maximizing the positive impacts.

1.4 What about potential new Borrow Pits after this EIA Study?

Due to the fact that the roadworks constantly explore for new BPs (when the current ones get depleted or become unfit due to water ingression), the management and mitigation measures provided in the EMRP will to apply current BPs for the road and future BPs associated with the Engoyi-Omuntele upgrading. However, for any new found BP(s) associated with these current roadworks, community-specific meetings (near the BPs in that specific village) should be held by RCC for the new and future BPs along this current roadwork.

1.5 What has been done before in terms of Environmental Assessment?

The road was environmentally cleared around 2007/2008 based on the requirements of the Environmental Management Act No. 7 of 2007 when it came into force but before the 2012 EIA Regulations. Environmental Management Monitoring Reports were compiled by Enviro Dynamics Environmental Management Consultants in in September 2007 for the. This Report was compiled and derived from the DR3645 (Onyaanya-Onanke) RA/DC – CR/07 – 2006: The Labour-Based Construction of DR3645 after the community meetings were also held on the following dates in 2006 as part of the road sections:

- 18 July 2006 in Omuntele
- 25 September 2006 in Omuntele.

The existing borrow pits of the road works were established before the EIA Regulations in 2012, thus, an ECC for the usage of the borrow pits is now required. Therefore, to comply with the EMA and its EIA Regulations and ensure environmental sustainability, the Proponent through the consulting engineer supervising the construction contractor has appointed Serja Hydrogeo-Environmental Consultants CC (Serja HGE Consultants), independent environmental consultants to apply for the ECC on their behalf.

An application for the ECC is being launched with the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF) by Serja Consultants. Upon screening of this Background Information Document (BID), Serja Consultants has been required to prepare an Environmental Scoping Report and Environmental Management Plan & Rehabilitation Plan (EMRP) in an application for the ECC. The required documents (Scoping Report and EMP/EMRP) will be submitted to the MEFT's for evaluation and consideration of the ECC.

1.6 Appointed Independent Environmental Consultant

To comply with the EMA and its Regulations and ensure environmental management, protection, and sustainability, the Proponent through the construction contractor appointed Serja Hydrogeo-Environmental Consultants CC, Independent Environmental Consultants to apply for the ECC and conduct the required Environmental Assessment Process, which includes Public Consultation and prepare the Environmental Assessment / Scoping Report and EMRP – Appendix A.

The EIA process, including public consultation and engagement as well as compilation of the associated documents were conducted and compiled by Ms. Fredrika Shagama. Ms. Shagama is a qualified and experienced Hydrogeologist and Environmental Assessment Practitioner (EAP) by training and experienced with over 8 years' experience in Groundwater and Environmental Management Consulting. The EAP' CV is attached to this Report as Appendix B.

1.7 Application for the Environmental Clearance Certificate

The application for the ECC process was done as follows:

- Preparation of prepared Background Information Document (BID) for the project activities,
- Launching of the ECC application on the ECC Portal of the Ministry of Environment, Forestry and Tourism (MEFT) with the Proponent details (accompanied by the BID) for project registration purposes and obtaining a MEFT application / reference number (initially APP-03953 but changed due to the data disappearance on the ECC Portal. Thus, re-registration was required),
- Completion of the Form 1 (Section 32) of the EIA Regulations with the required project and Proponent information,
- Submission of the printed hard copy of the ECC application (with affixed NAD300 revenue stamps as application fees attached hereto) is submitted to the MEFT. The MEFT's date stamped copy of the ECC application is uploaded on the ECC Portal as proof of application and payment.

The next component of the ECC application was to undertake an EIA process, which entails Baseline Assessment of the Biophysical and Social environments as well as Public Consultation & Engagement. The findings of the EIA process are then incorporated into a Scoping Report and an EMRP is also developed for the mitigation of potential adverse impacts anticipated from the project activities. The two documents and associated documents (appendices) are then submitted to the Environmental Commissioner at MEFT's Department of Environmental Affairs and Forestry (DEAF) for evaluation and consideration of the ECC.

1.8 Scope of Work and Report Contents

This Study has been conducted according to the EMA No. 7 of 2007, and its 2012 EIA Regulations as mentioned in the preceding subsections, i.e., the project require an ECC. Therefore, the process has been undertaken as required and guided by the Regulations.

This Report has been compiled as a required output of an environmental assessment process after the ECC application has been launched with MEFT. The Scoping Report, together with the EMRP and all its appendices will be submitted to the DEAF.

The document (report) covers the following chapters or sections, in addition to the introductory chapter:

- Project description and associated activities - (Chapter 2).
- Project alternatives considered (that were found to be environmentally friendly and technically feasible) - Chapter 3).
- The Legal requirements governing the project and its related activities, i.e., the legislations that the project activities must comply with (Chapter 4).
- The Environmental and Social Baseline of the project area - Chapter 5.
- The Public Consultation & Engagement Process undertaken to inform, invite and engage the public (stakeholders and interested & affected parties) on the project activities - Chapter 6.
- The Assessment of identified potential impacts associated with the project activities (Chapter 7) - This chapter presents both the positive and negative (adverse) as well as cumulative impacts, assessment methodology and the assessment of the negative impacts. The mitigation measures in the form of management action plans, with timeframe and implementation responsibilities are given in the EMRP.
- The recommendations and conclusions to the environmental assessment are presented under Chapter 8. The data sources (literature/references) consulted for the assessment are listed under Chapter 9.

Based on the information provided by the Proponent and the EAP's experience, description of the project activities is presented under the next chapter.

2 DESCRIPTION OF THE PROJECT ACTIVITIES

The project activities involve the upgrading of the DR3645 from gravel to low volume seal (LVS) standard by the Roads Contractor Company (the appointed construction contractor) under the supervision of Burmeister & Partners (Pty) Ltd Consulting Engineers. The work has been ongoing since 01 October 2023 and completion of works is anticipated for 26 October 2024.

To complete the road upgrading works, there is a need to expand the existing four borrow pits and open up three more borrow pits to supply the project with construction materials (sand and gravel) which is the core purpose of this EIA Study.

The exploration for borrow pits was carried out back in 2006/2007 (for existing BPs) and the new and potential sites was done recently and possibly continuing to supply the road works. To minimize haul costs, BPs are ideally spaced approximately 5km apart for selected sub-grade materials and 10km apart for sub-base and base materials as far as practicable.

2.1 Borrow Pits (BPs) Site descriptions and status

The BP sites were visited by Serja Consultants accompanied by two RCC representatives on the 02nd of July 2024 to observe the state (condition) they are in. Therefore, the site description and status of the seven BPs are provided under the next subheadings (sections).

It is important to note that the BPs are all on communal land (not in anyone's homeasted fence), therefore, consultations and engagements were done with respective headmen for the BPs. The consent letters for the establishment and utilization of the BPs in the six villages have been issued by the headmen. The Consent Letters are appended hereto as Appendix C.

For future BPs on these current works on the road, where additional BPs may be required and they would be inside someone's fence, compensation guidelines as per the Roads Authority and relevant government policies (National Compensation Policy) will be followed for implementation. This is to ensure that the affected landowners are compensated fairly and that the process and material extraction is done efficiently, safely and amicably.

2.1.1 BP 6 (Okanyowa Village)

This is a potential and new borrow pit located in Okanyowa Village on communal land and it is in an area that is poorly vegetated with about four matured young trees (Marula (*Sclerocarya birrea*) and Mopani (*Colophospermum mopane*), and some stinkbush or sweat bush (*Pechuel-loeschea*). There is an existing track/path to the site. BP6 is located on the right-hand side of existing gravel road (towards Omuntele from Engoyi) at an approximate haul road distance of approximately 4km from the road (DR3645) - Figure 2-1.

The community through their headman requested that the BP is rehabilitated to be used as a rainwater holding structure for community livestock watering.

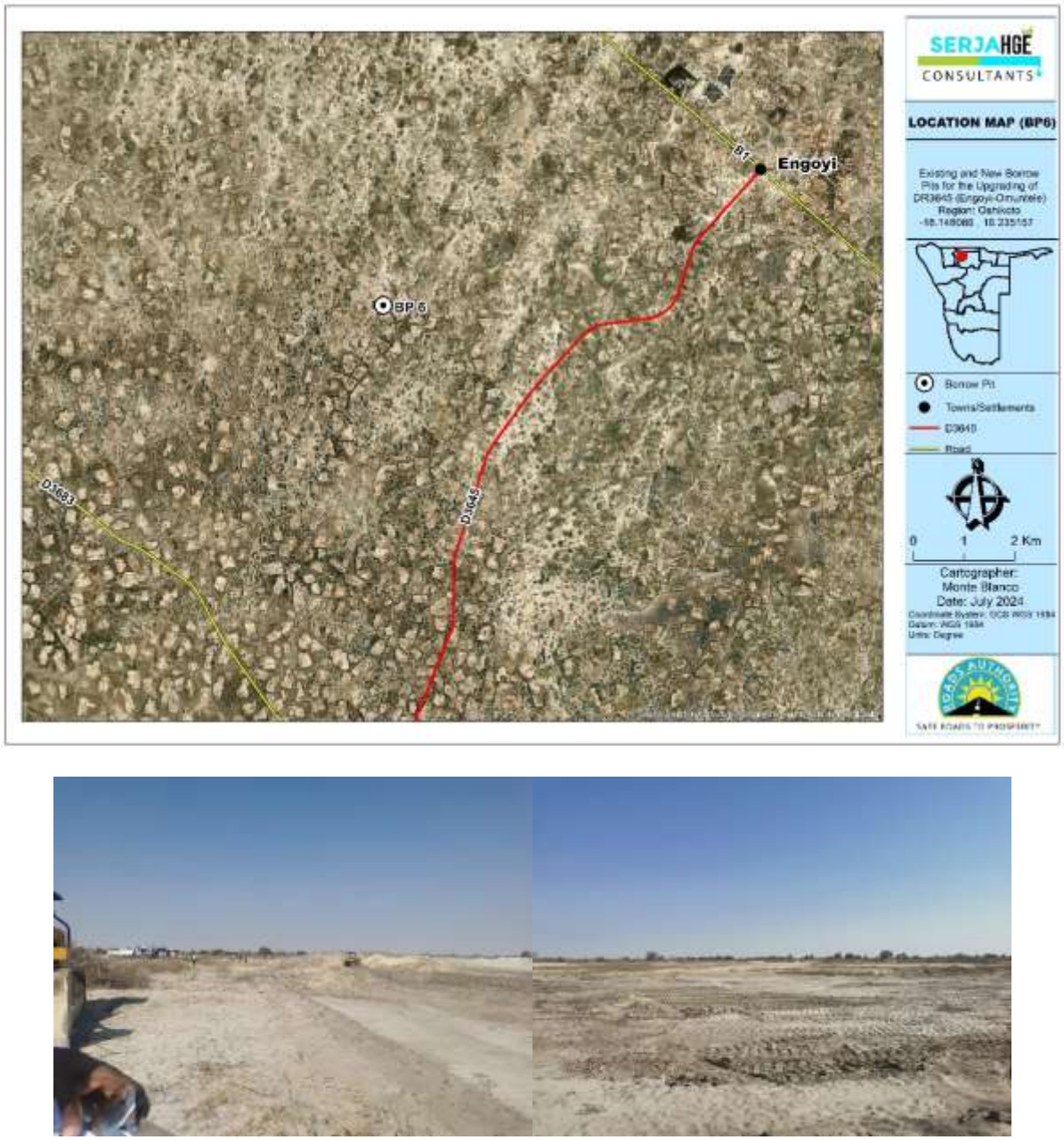


Figure 2-1: The locality map and site photos of BP 6

2.1.2 BP 8B (Opembelonga Village)

This is a new borrow pit located in Okanyowa Village on communal land and it is surrounding is medium to highly vegetated with shrubs of Mopani (*Colophospermum mopane*). There is an existing track/path to the site. The BP is located on the right-hand side of existing gravel road (towards Omuntele from Engoyi) at an approximate haul road distance of approximately 2.5km from the road - Figure 2-2. The desired material in the BP has depleted and there is groundwater ingression into the pit because the excavation has reached the water table, which makes it difficult for the excavator to dig deeper. Thus, the BP has no further use, therefore, it is awaits rehabilitation. The contractor indicated that the BP will be levelled and fenced off.

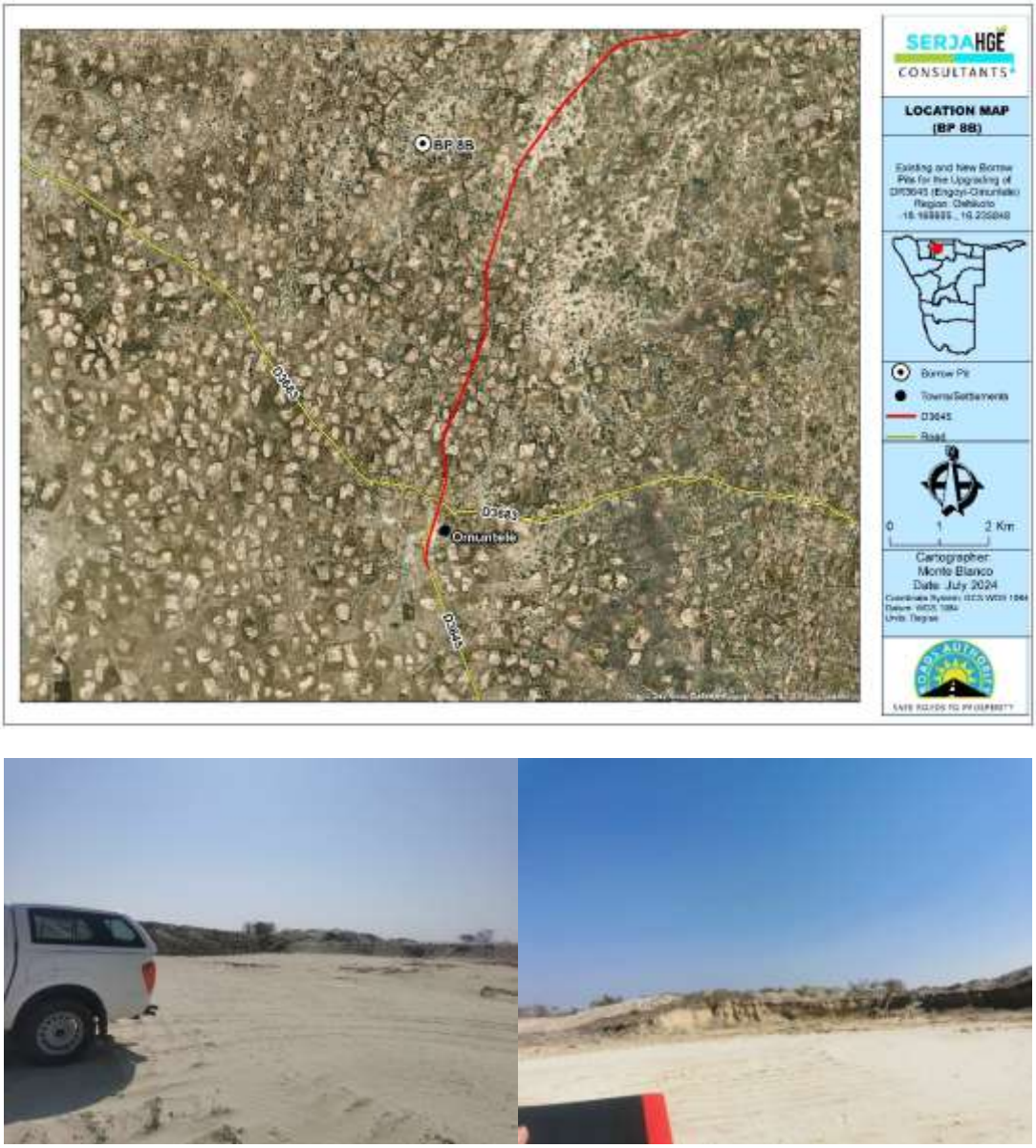


Figure 2-2: The locality map and site photos of BP 8B

2.1.3 BP 8A (Elonga Village)

This is an existing small borrow pit, located in Elonga Village on communal land and it is surrounding is medium vegetated with shrubs of Mopani (*Colophospermum mopane*). There is an existing track/path to the site and a powerline passing by the pit. The BP is located on the right-hand side of existing gravel road (towards Omuntele from Engoyi) at an approximate haul road distance of approximately 2km from the road - Figure 2-3. The material in the BP is too salty making, it unfavourable for the road construction. Therefore, it is awaiting formal levelling and rehabilitation.

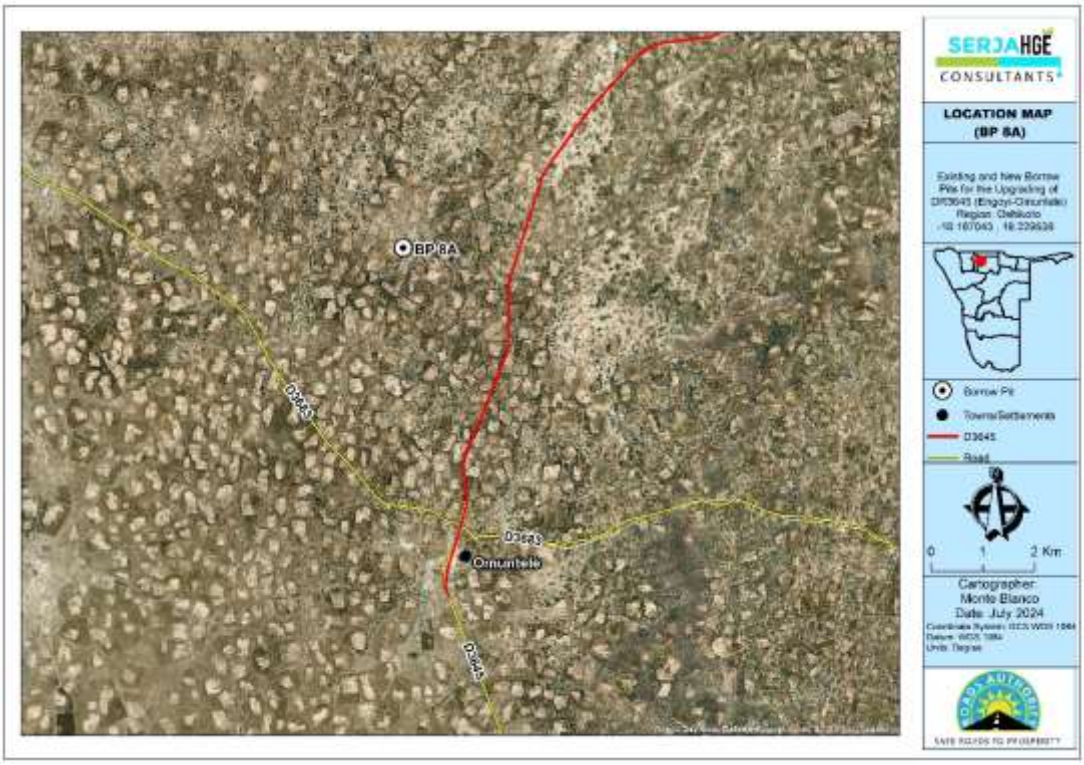


Figure 2-3: The locality map and site photos of BP 8A

2.1.4 BP 12 (Okwandja Village)

This is a new borrow pit, located in Okwandja Village on communal land and it is surrounding is medium vegetated with shrubs of Mopani (*Colophospermum mopane*). There is an existing track/path to the site. The BP is located on the right-hand side of existing gravel road (towards Omuntele from Engoyi)) at an approximate haul road distance of approximately 1.5km from the road - Figure 2-4. The BP has very good material, but also experiencing groundwater ingression such that the water could be seen idle in some of the pit's area. Similar to BP8A, the material is salty but the salt content in the material from BP 12 is manageable for road construction.

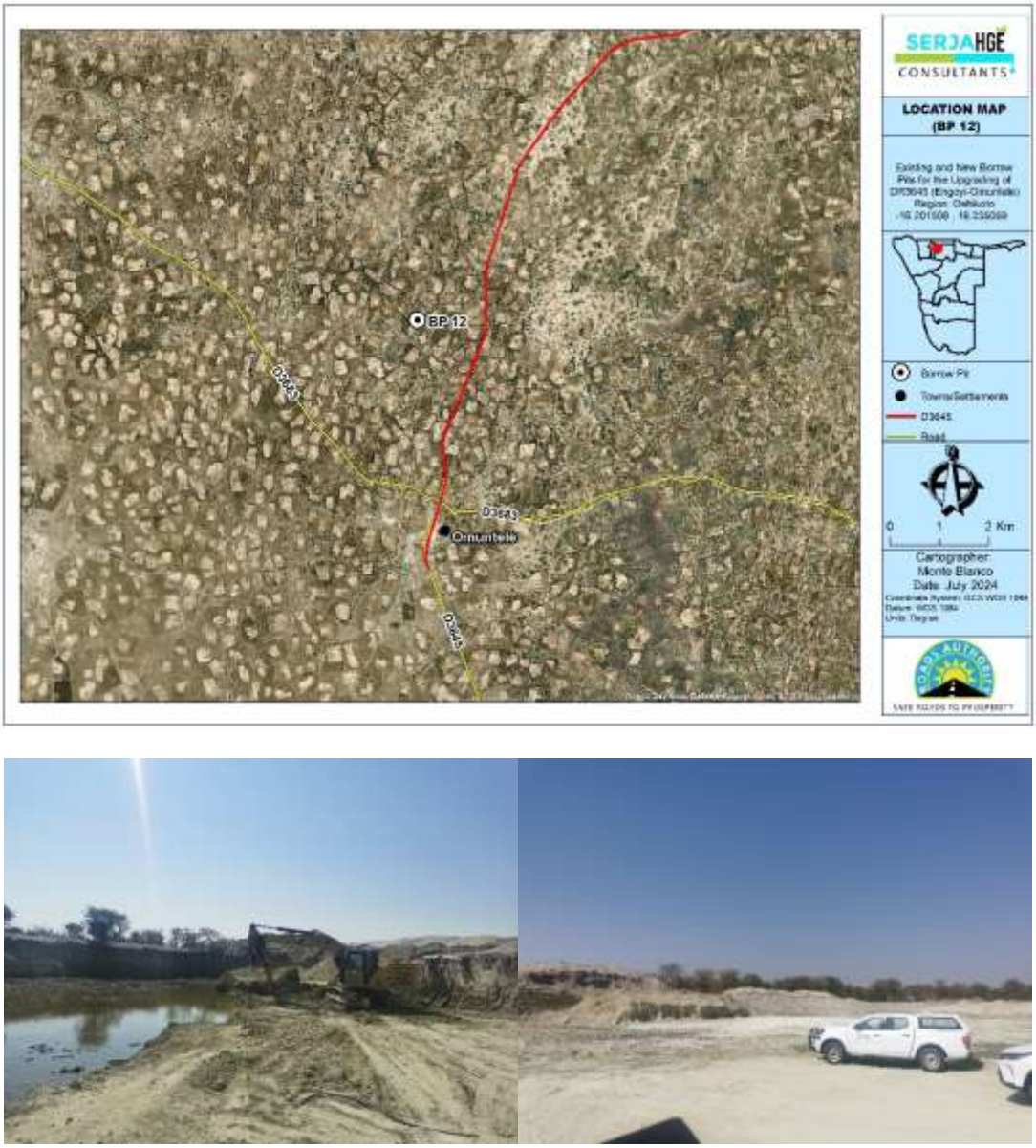


Figure 2-4: The locality map and site photos of BP 12

2.1.5 BP 15 RHS (Okwandja Village)

This BP has been extended (existing), located in Okwandja Village on communal land and it is surrounding is medium vegetated with shrubs of Mopani (*Colophospermum mopane*), one sand corkwood species (*Commiphora angolensis*) spotted on the western edge of the BP, a Marula tree (*Sclerocarya birrea*) to the southwest and further to the northeast and south are some Makalani palm trees (*Hyphaene petersiana*) can be seen. Other vegetation observed around the BP include the stinkbush or sweat bush (*Pechuel-loeschea*). There is an existing track/path to the site branching off the D3683 (from Omuntele Settlement to Uukwiyu). The BP is located on the right-hand side of existing gravel road (D3683) towards Omuntele from Uukwiyu side at an approximate haul road distance of approximately 2.5km from the road – Figure 2-5.

Figure 2-5

According to the accompanying RCC representative during site visit, this BP has high grade material for the road construction. The BP is experiencing groundwater ingression such that the water could be seen at the centre area of the BP. It is also said that the BP is created at an area where there was a small path used by the community and livestock. However, the path has been diverted off the BP route so that the community can use a safe area to the southern-western trend side of the pit.

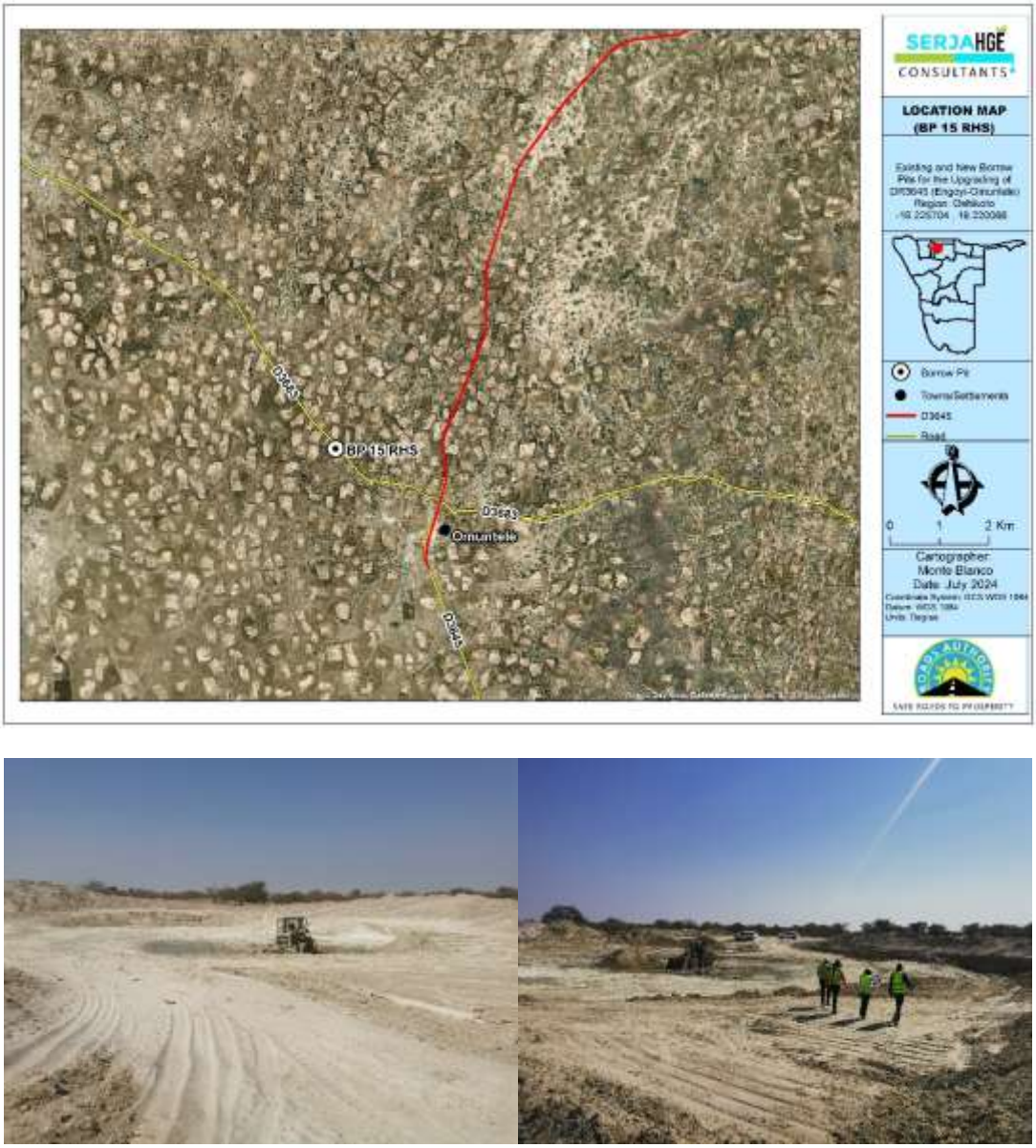


Figure 2-5: The locality map and site photos of BP 15 RHS

There is an existing old borrow pit to the immediate east of BP 15RHS. The borrow pit is possibly from the old construction of the Omuntele-Uukwiyu road (D3683). This borrow pit is fenced off (Figure 2-6) as part of its rehabilitation back in the days.

Figure 2-6: The fenced off old borrow pit next to BP 15 RHS

2.1.6 BP 15 LHS (Okandombe Village)

This BP has been extended (existing), located in Okandombe Village on communal land near the D3683. The BP is located on the left-hand side of existing gravel road (D3683) towards Omuntele at an approximate haul road distance of approximately 1.5km from the road - Figure 2-7. The surrounding vegetation are shrubs and young trees of Mopani (*Colophospermum mopane*) and Marula tree (*Sclerocarya birrea*) that could be observed inside the neighbouring homestead fence. There are also scattered shrubs of stink bush or sweat bush (*Pechuel-loeschea*) and red-bark acacia, red thorn (*Vachellia reficiens*) to the eastern and south-eastern side of the BP. There is an existing track/path to the site branching off the D3683 (from Omuntele Settlement towards Uukwiyu).

The BP is experiencing groundwater ingression such that the water could be seen at the centre area.

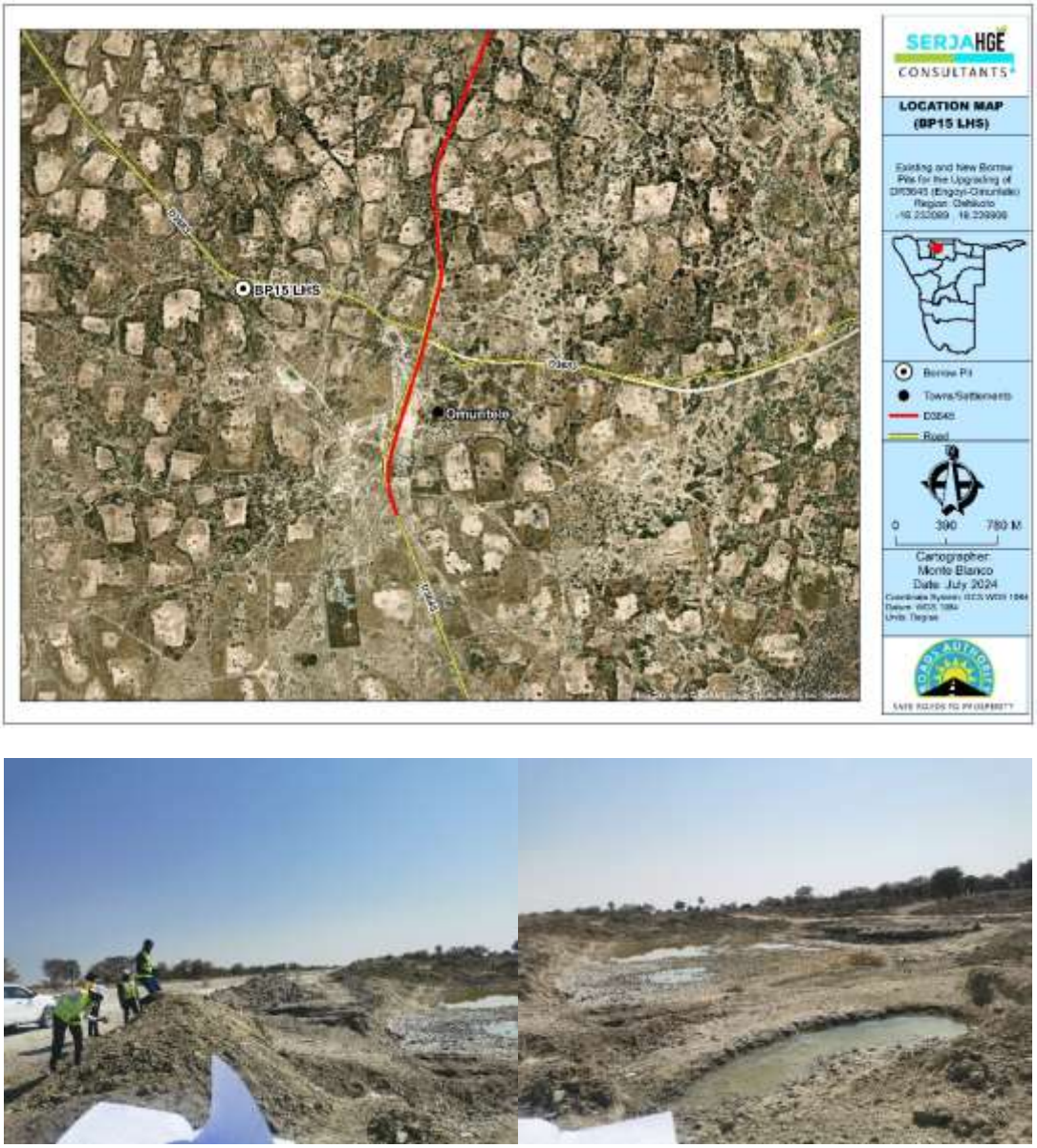


Figure 2-7: The locality map and site photos of BP 15 LHS

2.1.7 BP 31 (Onamutayi Village near Onamutenya local shops)

This BP site is new, and no excavation has been done on it yet- Figure 2-8. BP 31 site is next to an old borrow pit from the old construction works of DR3645 to Onanke and bordering a small natural salt pan (Figure 2-9). The site is located next to Onamutenya local shops in Onamutayi Village on communal land near the D3645 gravel road to Onanke. The BP site is located on the left-hand side of existing gravel road (D3683) towards Omuntele at an approximate haul road distance of less than 500m from the road

The site poorly vegetated with only grass cover on some areas, i.e., no significant vegetation.

Figure 2-8: The locality map and site photos of BP 31

Figure 2-9: The old borrow pit and small pink salt pan to the southwest of BP 31

2.2 Resources and Services Infrastructure

2.2.1 Human resources

The road upgrading employs one hundred and six (106) people. The workforce comprises a safety officer, resident engineer, assistant resident engineer, contracts manager, land surveyor, assistant surveyor, quality control technician, public liaison officer, maintenance artisan, 2 site clerks, 2 general foremen, 24 operators, 26 labourers, 6 security guards, 35 small and medium-sized enterprise (SME) labourers and 2 SME foremen. Priority for employment (semi to unskilled labour) has been given mainly to the locals.

2.2.2 Contractors' accommodation

Some of the skilled project workforce that is out-of the area is accommodated in a campsite near Engoyi Settlement along the road. This is to ensure that workers commence with works on time without the need to transport workers from and to homes daily. Some of the personnel commute from Ondangwa to site. The site personnel from the project area commute from their homes near the DR3645.

2.2.3 Vehicles and equipment

The project equipment, machinery and vehicles are stored at a designated area inside the RCC campsite near Engoyi. Machinery and vehicles for the BP activities include excavators, dump trucks, bulldozers, loaders, support vehicles (such as 4x4 wheel drive cars and other maintenance vehicles), etc. Some of these vehicles and machinery are shown in Figure 2-10 below.

Figure 2-10: Excavator at BP 15 RHS site as well as excavator and 5 dump trucks at BP6 site

2.2.4 Water supply

The water required for the project is supplied by NamWater from the existing scheme and stored in a fenced off lined water holding dam and carted by a water truck to working sites by a water trucker - Figure 2-11. This water is used for the actual road works and dust suppression. For human consumption and domestic use, there is a tap installed at the campsite.

Figure 2-11: The water holding dam between Ondjamba and Engoyi

2.2.5 Fuel supply

Diesel is used for machinery and equipment and fuel generator to ensure an interrupted fuel supply to the project (Figure 2-12). The fuel is supplied from a 23,000-litre (23m^3) tank that was recently installed at the RCC campsite near Engoyi Settlement on the 3rd of June 2024 and is in operation.

The 0.84m high diesel tank is contained (bunded) mounted on a steel stand inside a concrete plinth which is 110% larger than its size. The surface area covered by the tank facility is 30m^2. The base of the tank is lined with the impermeable Polyvinyl chloride (PVC) material under concrete layer to prevent infiltration of accidental oil spills into the soil and groundwater. There are oil spills control measures onsite, i.e., the absorbent material contained in the fuel spill equipment (natural sponge-like material) that can absorb accidental fuel spillage or leaks.

Figure 2-12: The diesel (fuel) tank within the contractors' campsite near Engoyi Settlement

The fuel is dispensed through the typical pumping system (as shown above) to supply the project machinery as often as needed, while the refilling of the tank is done once a week.

A consumer installation certificate for the tank is underway with the Ministry of Mines and Energy (MME) and a separate Environmental Management Plan (EMP) for the tank has been prepared by Serja Consultants. A separate ECC application for the tank has also been launched with MEFT (APP- 004188).

2.2.6 Occupational health and safety

All project workers are supplied with appropriate and adequate personal protective equipment (PPE) while carrying project activities onsite. The site is also equipped with one fully furnished first aid kit.

2.2.7 Accidental fire outbreaks

The campsite and vehicles are equipped with fire extinguishers in case of accidental fire outbreaks.

2.2.8 Waste management (solid waste)

All solid waste generated from the project activities are sorted, stored on site in designated waste containers and transported to the Ondangwa's dumping site.

2.2.9 Human waste/sanitation

The appointed contractor has flushing toilets with septic tank for the workers and project related visitors. The tank is emptied according to the manufacturer's instruction and as regularly as deemed necessary.

For the project personnel stationed along the road, the portable toilets have been ordered from a supplier and these will be erected at working sites and at a spacing of 4km along the road.

2.2.10 Hazardous waste (fuels)

There is no hazardous waste yet generated from the tank at the campsite, however, measures are in place (provided in the fuel tank EMP) to mitigate and or manage potential accidental fuel spills or leakage.

The hazardous waste will be properly captured, stored on site in designated waste containers and transported to Oluno temporary storage facility before the waste is transported to the appropriate hazardous waste management facility (in Windhoek). Therefore, no hazardous waste will be disposed of in any other waste management facility in the project area or Oshikoto Region at large.

2.3 Decommissioning and Rehabilitation of Borrow Pits

Once the materials get depleted in the BPs or the material in the BPs no longer meets the standards, too salty or there is an unmanageable ingression of groundwater into the pit(s), the construction contractor will need to put site rehabilitation measures in place. Decommissioning and rehabilitation are primarily reinforced through a decommissioning and rehabilitation plan, which consists of safety, health, environmental, and contingency aspects. Therefore, it is of best practice for the Proponent through their contractor to ensure the project and associated activities, mainly the BP sites are ceased in an environmentally friendly manner and sites are rehabilitated by carrying out the following:

- Dismantling and removal of campsites and associated infrastructures from the project site areas,
- Carrying away all project equipment and vehicles, and

- Clean up of site working areas and transporting the recently generated waste to the nearby approved waste management facility (as per agreement with the waste facility operator/owner),

Further decommissioning and rehabilitation practice at the BPs will include:

- Backfilling of pits and trenches associated with the construction materials sourcing in the area,
- Closing and capping of road works' holes to ensure that they do not pose a risk to both people and animals in the area, and
- Levelling of stockpiled topsoil. This will be done to ensure that the disturbed land sites are left close to their original state as much as possible.

The next chapter is the presentation different and relevant alternatives considered for the project activities.

3 PROJECT ALTERNATIVES

Alternatives are defined as the “different means of meeting the general purpose and requirements of the activity” (EMA, 2007). This section will highlight the different ways in which the project can be undertaken and to identify the alternative that will be the most practical, but least damaging to the environment is identified.

Once the alternatives have been established, these are examined by asking the following three questions:

- *What alternatives are technically and economically feasible?*
- *What are the environmental effects associated with the feasible alternatives?*
- *What is the rationale for selecting the preferred alternative?*

The alternatives considered for the project activities are presented below.

3.1 The "No-Go" Alternative

The “no action” alternative implies that the status quo remains, and nothing happens. Should the excavation of new BPs or extending existing BPs be halted or stopped completely, the road construction works will also be halted and stopped. Consequently, there will be no road upgrading from gravel to tarred road for the DR3645. Moreover, none of the potential impacts (positive and negative) identified would occur. If the project activities are to be discontinued, the status quo of the land would remain unchanged. This option was considered and a comparative assessment of the environmental and socio-economic impacts of the “no action” alternative was undertaken to establish what benefits might be lost if the project is not completed.

Considering the above losses, the “no-action/go” alternative was not considered a viable option for this project.

3.2 Borrow Pit Sites (Location)

The BP sites are area specific because the material required is determined by the desired and qualified standards for road construction. Furthermore, the BPs are sited near the road works to decrease truck cycles and further damage to the environmental such as creation of long-haul roads between BPs far from the road. Therefore, finding alternative locations that the selected sites for may not be feasible nor environmental and economic friendly.

3.3 Services Infrastructure

Alternatives were considered for different supporting infrastructures to ensure that the most feasible options were selected. The technological, economic, and environmental limitations were considered to select the most feasible option. The alternative considered in this regard are presented in Table 3-1 below.

Table 3-1: The presentation of service infrastructure alternatives considered for the project activities

Category of Infrastructure	Alternatives Considered	Justification for selected option
Ablution facilities	-Install fixed facility with septic tank -Portable facilities with septic tank	-To minimize rehabilitation costs and ensuring good hygiene onsite, a flushing portable facility was selected as the best option. For the personnel along the road, portal toilets are provided.
Water supply	-Bring water from elsewhere -Abstract from site boreholes	-The project water is brought from elsewhere at a water holding tank supplied by NamWater. This is to prevent drilling of new boreholes in the area where the water is mostly salty, making it unfit for use.
Fuel storage	-Trailer mounted diesel tank -Fixed bunded fuel tank	-A fixed bunded fuel tank is installed at the campsite near Engoyi instead of a trailer mounted tank. This is to ensure that there is only one source of fuel dispensing and under control conditions at the camp
Power supply	-Diesel generator set and if considered, solar power. -Powerline (grid) supply	-The actual road works use generators while the campsite is connected to the power grid because it is close to the grid.
Offices, accommodation	-Erect dis-mantable prefabricated units -Fixed structures	-Dis-mantable prefabricated units are favored due to: (a) Ease of installation, (b) Low installation costs and (c) Ease of dismantling and moving.
Accommodation site	-Setting up campsite -Commuting from Ondangwa (about 40km away) -Commuting from home in the area	-Set up temporary campsite for out-of-area specialized personnel -Some personnel commute from Ondangwa due to limited campsite capacity -Other personnel such as some casual laborers and operators commute from their home to site.

The following chapter presents the national and international legal requirements that are applicable and relevant to project.

4 APPLICABLE LEGAL FRAMEWORK

The project's activities or some of them may be regulated and governed by certain legal or policies. Therefore, it is necessary to review and consider these legislations and legal requirements. These legal requirements are either on a local (institutional), national (Namibian) and international legislation, policies, guidelines, etc. The review of relevant legal framework serves to inform the project Proponent, interested and affected parties, and the decision-makers at the DEAF of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled to establish the project activities.

4.1 National Legal Framework: Laws, Policies and Regulations

The national applicable legal framework and policies relevant to the project are presented in Table 4-1.

Table 4-1: List of applicable legislation for the project activities

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
The Constitution of the Republic of Namibia, 1990 as amended	The Constitution of the Republic of Namibia (1990 as amended) addresses matters relating to environmental protection and sustainable development. Article 91(c) defines the functions of the Ombudsman to include: "…the duty to investigate complaints concerning the over-utilisation of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia…" Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at the: "…Natural resources situated in the soil and on the subsoil, the internal waters, in the sea, in the continental shelf, and in the exclusive economic zone are property of the State."	By implementing the environmental management plan, the establishment will be in conformant to the constitution in terms of environmental management and sustainability. Ecological sustainability will be main priority for the project.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Environmental Assessment Policy of Namibia 1994	The policy provides a definition to the term "Environment" broadly interpreted to include biophysical, social, economic, cultural, historical and political components and provides reference to the inclusion of alternatives in all projects, policies, programmes and plans.	This EIA outlines the environmental consequences of this project and considers this definition of Environment.
Environmental Management Act No. 7 of 2007 and its 2012 EIA Regulations	The Act aims to ensure that the potential impacts of the development on the environment are considered carefully and in good time; that all interested and affected parties have a chance to participate in the environmental assessments and that the findings of the environmental assessments are fully considered before any decisions are made about activities which might affect the environment.	The Act aims at promoting sustainable management of the environment and use of natural resources. The EMA is broad; it regulates land use development through environmental clearance certification and/or Environmental Impact Assessments. The Act provides for the clearance certification for quarrying activities associated with borrow pits.
Traditional Authority Act (Act No. 25 of 2000):	The Act also stipulates that Traditional Authorities (TAs) should ensure that natural resources are used on a sustainable basis that conserves the ecosystem. The implications of this Act are that TAs must be fully involved in the planning of land use and development for their area. It is the responsibility of the TA's customary leadership, the Chiefs, to exercise control on behalf of the state and the residents in their designated area.	The BPs fall within the OTA's villages under. Therefore, the local representatives (headmen) should be consulted for the land use consent and engagement should continue throughout the project.
Communal Land Reform Act 5 of 2002	To provide for the allocation of rights in respect of communal land; to establish Communal Land Boards; to provide for the powers of Chiefs and Traditional Authorities and boards in relation to communal land; and to make provision for incidental matters	The Proponent should ensure that the project complies with the regulations provided therein for road reserve, furniture and borrow pits.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Roads Authority Environmental Manual (October 2014)	The manual seeks to inform practitioners regarding the legal and contractual framework within which roads must be designed and built. It also seeks to provide guidance regarding the requirements of the Roads Authority in respect of environmental issues	The EIA and resultant road upgrade design and activities should be conducted in line with the guidelines within the document.
Roads Ordinance No 17 of 1972	The Ordinance consolidates the laws relating to roads: Section 3.1 deals with width of proclaimed roads and road reserve boundaries. Section 27.1 is concerned with the control of traffic on urban trunk and main roads. Section 36.1 regulates rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads. Section 37.1 deals with infringements/obstructions on and interference with proclaimed roads.	The road upgrade must adhere to all applicable provisions in the Roads Ordinance
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that "No person shall possess [sic] or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area"	The Proponent through their construction contractor should obtain the necessary authorisation from the MME for the storage of fuel on-site. This entails the application of consumer installation certificate.
Road Traffic Ordinance 30 of 1967	The Ordinance governs road traffic comprehensively.	The project should consider the impact it will have on road traffic in the subject area.
Roads Authority Act No 17 of 1999	The Act establishes a Roads Authority to manage the national road network of Namibia.	The Roads Authority is the Proponent for the project activities.
National Road Safety Act No 9 of 1972	The Act establishes the National Road Safety Council and includes provisions intended to promote road safety.	The project should consider the impact it will have on road safety in the subject area.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Hazardous Substance Ordinance, No. 14 of 1974	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.	The Proponent should handle and manage the storage and use of hazardous substances on site so that they do not harm or compromise the site environment
National Solid Waste Management Strategy	The Strategy ensures that the future directions, regulations, funding and action plans to improve solid waste management are properly co-ordinated and consistent with national policy, and to facilitate co-operation between stakeholders Waste disposal is the main problem with the current solid waste management in Namibia. The top priority is to reduce risks to the environment and public health from current waste disposal sites and illegal dumping in many areas of Namibia.	The road upgrade can potentially generate significant amount of solid waste (stockpiles, soil remains, rubbles) that might need proper management by contractors to avoid pollution. Waste management plans should be generated and implemented prior the commencement of civil works and during project operations. Contractors operating at the BPs and actual road works should reduce the risk of solid waste to the environment and surroundings of the project area.
The Regional Councils Act (No. 22 of 1992)	This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning point of view, their duties include, as described in section 28 “to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment.	The relevant Regional Councils are I&APs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the Oshikoto Regional Council (Onyaanya and Omuntele Constituencies); therefore, they should be consulted.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Water Resources Management Act (No 11 of 2013) and its 2023 Water Regulations	The Act provides for the management, protection, development, use and conservation of water resources; and provides for the regulation and monitoring of water services and to provide for incidental matters. The objects of this Act are to: Ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (Section 68).	The protection (both quality and quantity/abstraction) of water resources should be a priority. Relevant permits and or agreements to abstract and use water should be applied for and obtained.
National Heritage Act No. 27 of 2004	To provide for the protection and conservation of places and objects of heritage significance and the registration of such places and objects; to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.	The Proponent should ensure compliance with these Acts requirements. The necessary management measures and related permitting requirements must be taken. This done by the consulting with the National Heritage Council of Namibia. A Chance Finds Procedure provided to the Draft EMP should be implemented upon discovery of archaeological and heritage resources.
The National Monuments Act (No. 28 of 1969)	The Act enables the proclamation of national monuments and protects archaeological sites.	
Soil Conservation Act (No 76 of 1969)	The Act makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources and resources, through directives declared by the Minister.	Duty of care must be applied to soil conservation and management measures must be included in the EMP.
Forestry Act (Act No. 12 of 2001	The Act provides for the management and use of forests and forest products.	The proponent will apply for the relevant permit under this Act if it becomes necessary to remove protected trees such as camelthorn, Marula, Makalani Palm and sand corkwood.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
	Section 22. (1) provides: "Unless otherwise authorised by this Act, or by a licence issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove - (a) vegetation which is on a sand dune or drifting sand or on a gully unless the cutting, destruction or removal is done for the purpose of stabilising the sand or gully; or (b) any living tree, bush or shrub growing within 100 m of a river, stream or watercourse."	
Public Health Act (No. 36 of 1919)	Section 119 states that "no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	The Proponent and all its employees should ensure compliance with the provisions of these legal instruments.
Public and Environmental Health Act No. 1 of 2015	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety of labourers.	
Atmospheric Pollution Prevention Ordinance (1976)	This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, apart from East Caprivi, is proclaimed as a controlled area for the purposes of section 4(1) (a) of the ordinance.	The project and related activities should be undertaken in such a way that they do not pollute or compromise the surrounding air quality. Mitigation measures should be put in place and implemented.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Road Traffic and Transport Act, No. 22 of 1999	The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto.	Mitigation measures should be provided for, if the roads and traffic impact cannot be avoided.
Labour Act (No. 6 of 1992)	Ministry of Labour, Industrial Relations and Employment Creation is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety and enhanced labour market services for the benefit of all Namibians. This ministry insures effective implementation of the Labour Act No. 6 of 1992.	The Proponent should ensure that the project activities do not compromise the safety and welfare of workers.

4.2 International Policies, Principles, Standards, Treaties and Conventions

4.2.1 Applicable International statues (treaties and conventions) and policies

The other international statues such as policies, standards and conventions that may govern the project activities are provided under Table 4-2 below.

Table 4-2: Other international treaties and conventions governing the project activities

Statue	Relevant Provisions	Implications for the project / Requirements
The United Nations Convention to Combat Desertification (UNCCD) 1992	Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change. The convention objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability United Nation Convention	The project activities should not be undertaken such that they contribute to desertification.

Statue	Relevant Provisions	Implications for the project / Requirements
Convention on Biological Diversity 1992	Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use. Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings	The removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimised
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: "a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.

Other relevant international Treaties and Protocols ratified by the Namibian Government are:

Other relevant international Treaties and Protocols ratified by the Namibian Government are:

- Convention on International Trade and Endangered Species of Wild Fauna and Flora (CITES), 1973.
- Convention on Biological Diversity, 1992, and
- World Heritage Convention, 1972.

In addition to the project description, alternatives, and legal framework, it is also important to note that the project activities are undertaken in a specific environment, in terms of biophysical and social. Therefore, understanding these existing environmental features before the project activities, is crucial for the assessment of the potential impacts stemming from the project activities on the features.

5 BIOPHYSICAL AND SOCIAL BASELINE

The road works and associated activities (borrow pits utilization) are undertaken in specific environmental and social conditions. Therefore, understanding the pre-project conditions of the environment aids in describing the status quo versus future projections of environmental conditions once the project is implemented. The baseline information also aids in identifying the sensitive environmental features and how best suitable management and mitigation measures can be recommended for implementation. The summary of selected biophysical and social baseline information about the project area is given below.

The baseline information presented below is sourced from site visit (done on the 02nd of July 2024), online sources ranging from old reports, books and publishing as well as other relevant research information in the broader area. The project baseline that is deemed necessary to the project activities are as follows.

5.1 Biological Environment

The description of the biological (faunal and floral) environment of the area is presented below.

5.1.1 Fauna

The area through which the DR3645 passes, is a communal area with livestock farming in the villages The common livestock kept in these villages are goats, sheep, donkeys, cattle and pigs. Some livestock (goats) observed near the DR3645 are shown in Figure 5-1.

Figure 5-1: Some goats observed near the DR3645

5.1.2 Flora

The vegetation structure of the project area is mainly characterized by sparse shrub land (that covers all the entire site area where the BPs are situated), and a bit of woodland at Engoyi as shown on the vegetation map in Figure 5-2.

Figure 5-2: The vegetation structure map in the project area

The observed vegetation in the area around the BP sites are as follows:

- scattered shrubs and young trees of Mopani (*Colophospermum mopane*) – protected,
- Marula trees (*Sclerocarya birrea*) – protected,
- Stink bush or sweat bush (*Pechuel-loeschea*),
- Red-bark acacia, red thorn (*Vachellia reficiens*),
- Makalani palm trees (*Hyphaene petersiana*), and
- Sand corkwood species (*Commiphora angolensis*).

The site areas and broader project are also covered by grass cover. Some of the vegetation species observed during the site visit are shown in Figure 5-3.

Figure 5-3: Vegetation observed along or near the DR3645 and the BPs

5.2 Physical Environment

5.2.1 Climate

The climatic conditions of northern Namibia are classified as semi-arid, and these are summarized below:

- Rainfall and Precipitation: The average rainfall in the area is between 350 and 400mm per year. The variation I rainfall is averaged to be between 40-50% per year. The high summer rains are experienced in February. The storms events occur between October and April, and they are irregular, unpredictable, unpredictable, high intensity and highly localised.

- Evaporation: The average evaporation is between 2,800-3,200 mm per year.
- Temperatures: The area has highest temperatures measured in December with an average daily maximum of 31°C and minimum of 17.3°C. The coldest temperatures are measured in July with an average daily maximum of 20.4°C and minimum of 6.4°C.

5.2.2 Landscape and topography

The project area and most areas in northern Namibia are situated in the Cuvelai Basin whereby most of the land surface of is very flat, dipping from 1,150 m above sea level in the northeast to 1,080 m above sea level in the Etosha Pan to the south (Lohe et al., 2021). However, the project site falls within the Kalahari Sandveld landscape. This landscape is dominated by savannah woodlands growing on sands deposited by wind over the last 70-56 million years. The landscape is particularly flat, although the sand has been moulded into dunes in some area (Mendelsohn et al., 2002)

With regards to topography, the Oshikoto Region is generally flat with an altitude ranging from 800 to 1,200m above sea level (Mendelsohn et al., 2009). The landscape of the project area falls under the Cuvelai System. The project area is relatively flat with elevations ranging between 951 and 1,216 meters above sea level (masl) as shown on the topographic map in in Figure 5-4 below.

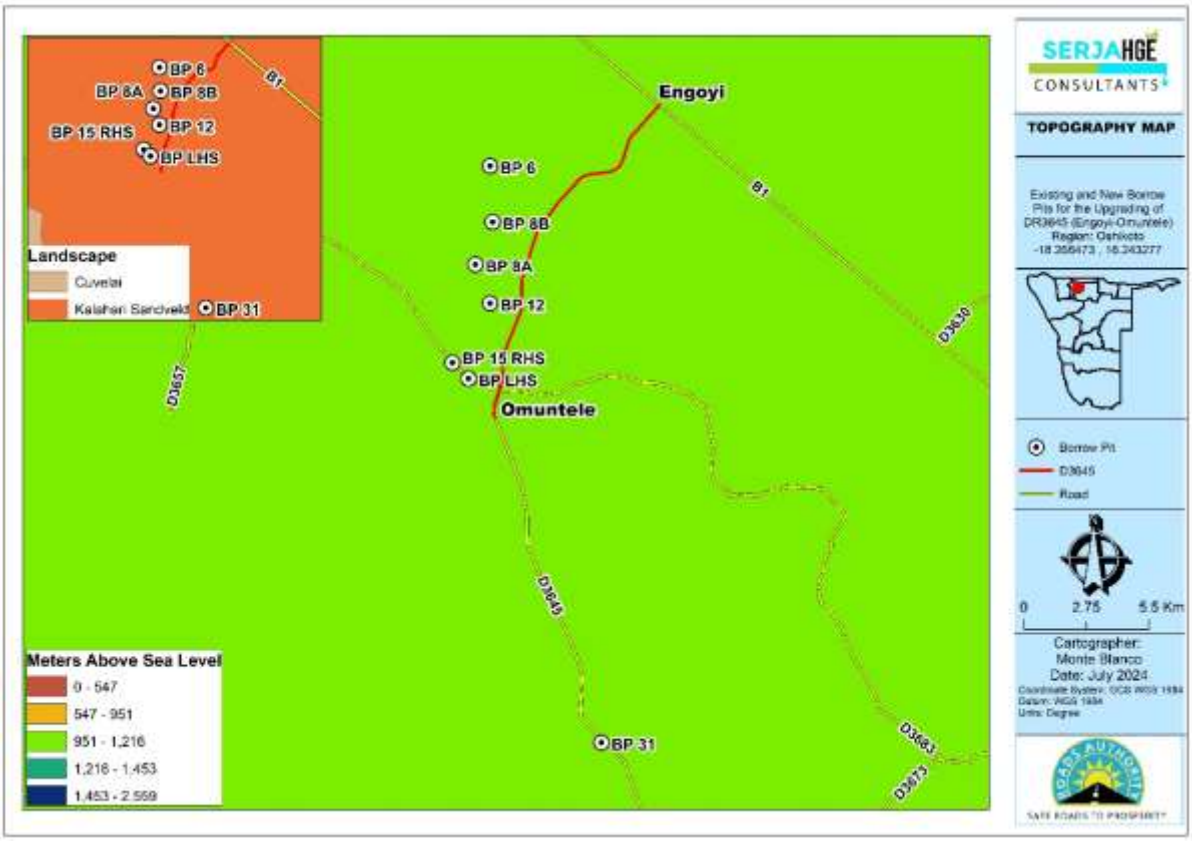


Figure 5-4: The topography and landscape of the area

5.2.3 Geology

The geology of area is characterized by the unconsolidated to semi-consolidated sands, calcrete and gravel sediments of the Quaternary and Tertiary age of the Kalahari Group. Much of the areas in the northern part of Namibia, including Oshikoto Region fall within the Cuvelai landscape, lies on silt, clay, limestone, and sandstone sediments. The area is distinguished by a myriad of drainage channels locally known as *oshanas*. These *oshanas* are often filled with water during heavy rainy seasons and cut into the underlying sediments (Shagama, 2022).

The geology around the BPs and DR3645 road is shown in Figure 5-5 which indicates that the site lies over unconsolidated alluvium, sand, gravel, and calcrete and these unconsolidated sediments are underlain by the rock units of red mudstone, siltstone, sandstone and conglomerate

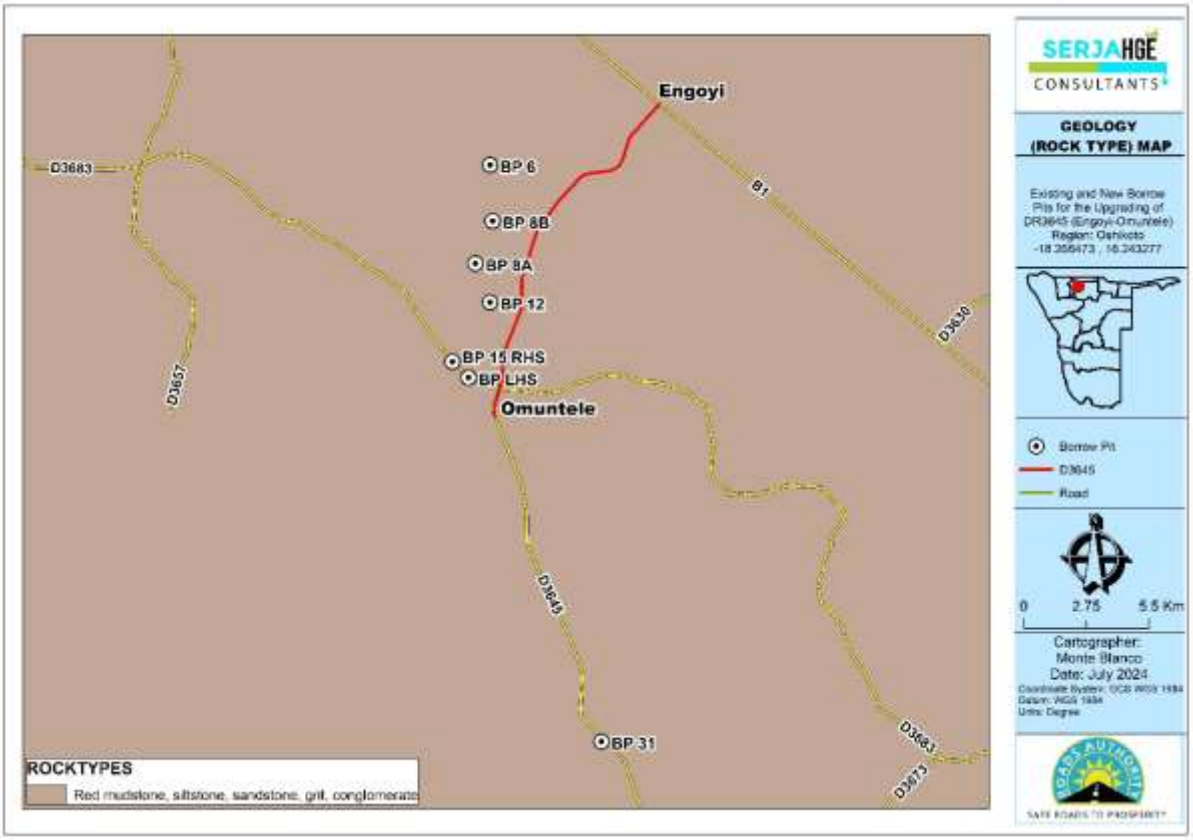


Figure 5-5: The geology of the project route area and surroundings

5.2.4 Soils

The dominant soil types in the Oshikoto Region are cambic arenosols and some areas ferralic arenosols with the six BPs being overlain by cambic arenosols and BP 31 falling at the borders of both soil types as per the soil map in Figure 5-6. According to Mendelsohn et al (2002), the prefix on the soil name (cambic) means that these soils are characterized by changes in color, structure and consistency. Arenosols are

soils that are formed from wind-blown sand and usually extend to a depth of at least 1m, with sand generally making up more than 70% of the soil. The rest of the soil usually consists of particles of clay and silt.

The soil types in the Oshikoto Region vary considerably, for the most part the soil consists of volatile sand mixed with a small percentage of silt and clay (arenosols), in the north-east there are also soils deriving from oshana deposits and in the south the soils are mainly clayey (Iuvisols), deposits (cambisols) or rocky outcrops. The soils in this area are categorized as sands and loams, where wind and water has repeatedly reworked the soil to create a mixture of deposits, they are generally saline, hence the dominance of Mopani vegetation which can grow on these soils.

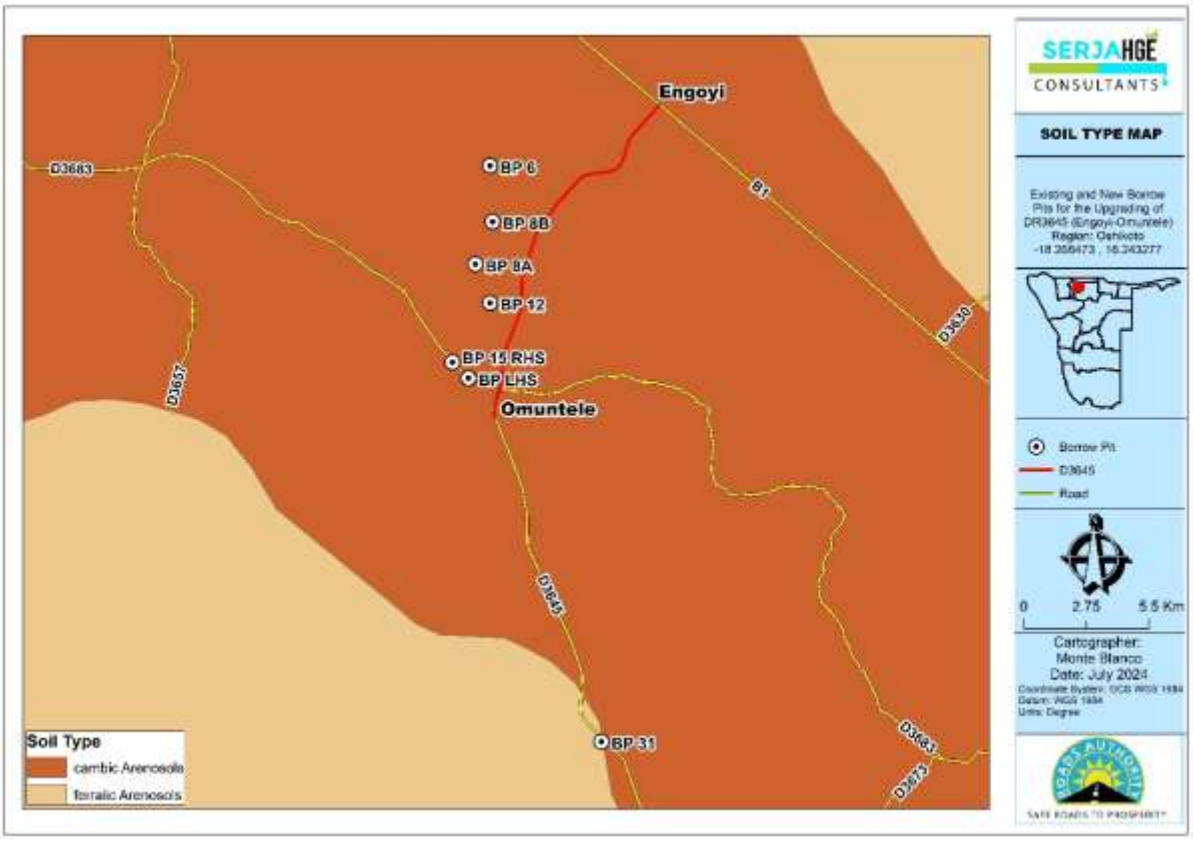


Figure 5-6: The dominant soil types within and around the project area

Soils around the site are sandy loamy with a light brown color but they show signs of high influence by the activities of the BPs.

5.2.5 Water resources: groundwater (hydrogeology) and surface water (hydrology)

The project area and the Oshikoto Region at large falls under the Cuvelai - Etosha Basin (CEB), which is defined as the Namibian part of the Cuvelai river catchment. The hydrogeology of the CEB comprises in addition to Omusati, the Oshana, Ohangwena, Oshikoto Regions and parts of the Kunene Region (Lohe et al., 2021). Groundwater flow is mostly through primary porosity in the Kalahari cover, but flow along

secondary structures known as fractures, faults. The flow can also be influenced by the presence of other geological structures underlying formations such as contact rock unit zones. Futhermore, recharge from rainfall is an important parameter determining the groundwater potential, but the degree of metamorphism affects the groundwater potential too. The groundwater potential of the rocks decreases, as the degree of metamorphism increases.

In addition to the above, Crystalline rocks, such as the various granites and gneisses that occur in the area, normally exhibit a very low tendency to store water. Drilling targets in these hard rock areas are mainly the fractured zones and faults, but the success rate and yields for these rock types are generally low. This can be considered as one of the most difficult areas to drill for water (Lohe *et al*., 2021).

Groundwater in and around the project site is hosted in the porous Kalahari sediments as shown in Figure 5-7. The sediments are in some areas of Basin underlain by bedrocks of limestone, sandstone, conglomerate, mudstone, and silt stone as the CEB aquifers and lithology characteristics presented in Lohe et al., (2021). The groundwater flow in the project area can be expected to flow in a south-eastern direction towards the Etosha Pan. There are no boreholes presence around the site. The only boreholes capture in the wider project area are over 10km away to the northwest and southeast as shown on the map below.

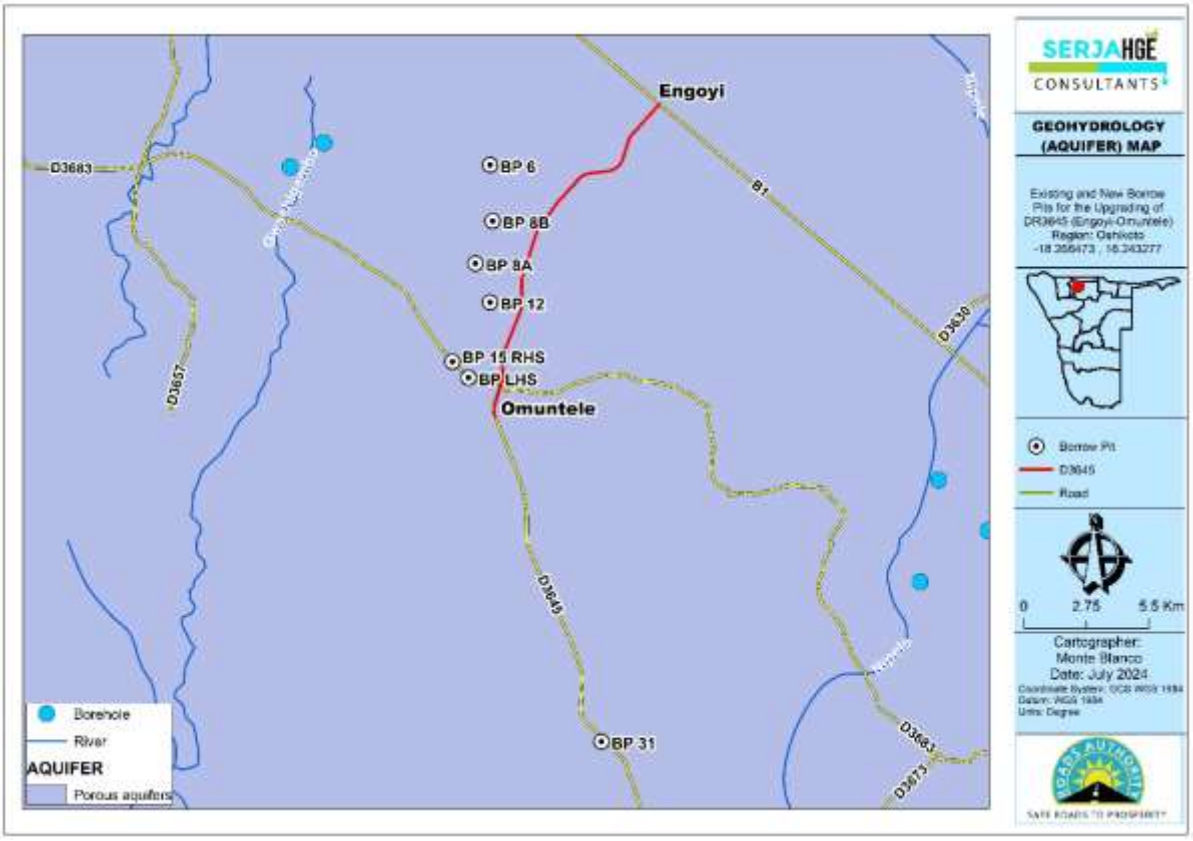


Figure 5-7: The surface and groundwater (geohydrology) map of the area

The northern area of Namibia is dominated by open shallow water systems (locally known as *oshanas*) that are filled with water during heavy rainy season and hold water for most of the year. The site area falls within the Cuvelai Basin which is characterized by many open oshanas that fill with rainwater during good rainy seasons. All the basin surface drainage, therefore, flows slowly in the direction of the Etosha Pan. According to Lohe et al, (2021), oshanas are shallow, often vegetated and poorly defined but are interconnected flood channels and pans. These surface water channels flow slowly or may form ponds depending on the intensity of the floods (known locally as "*Efundja*").

5.2.6 Groundwater quality

The groundwater quality over much of the Basin is extremely poor and severely limits its use and this could explain the heavy reliance on surface water schemes for water supply in the Basin. North of the Etosha Pan, the Kalahari and Karoo sequences and the upper part of the Owambo Formation form a large reservoir containing highly saline groundwater. There is little anthropogenic contamination of groundwater in general, but untreated wastewater in some communities causes degradation of quality. There are some cases of increased nitrate concentration linked to cattle farming, and some natural occurrence of elevated nitrate. The main groundwater quality problem in Namibia is naturally high TDS and fluoride (Christelis et al., 2018), which explains the poor quality in the CEB in under which the project site is found. The total dissolved solid (TDS) ranges from 30,000 to 100,000 milligram per litre (mg/l) and chloride concentrations are 10,000 to 40,000 mg/l. The water quality is especially poor in the central areas extending south from Namibia-Angola border between Oshikango and Ruacana in a south easterly direction towards Etosha and Oshivelo (Christelis and Struckmeier, 2011). The groundwater quality map of the project area is shown in Figure 5-8.

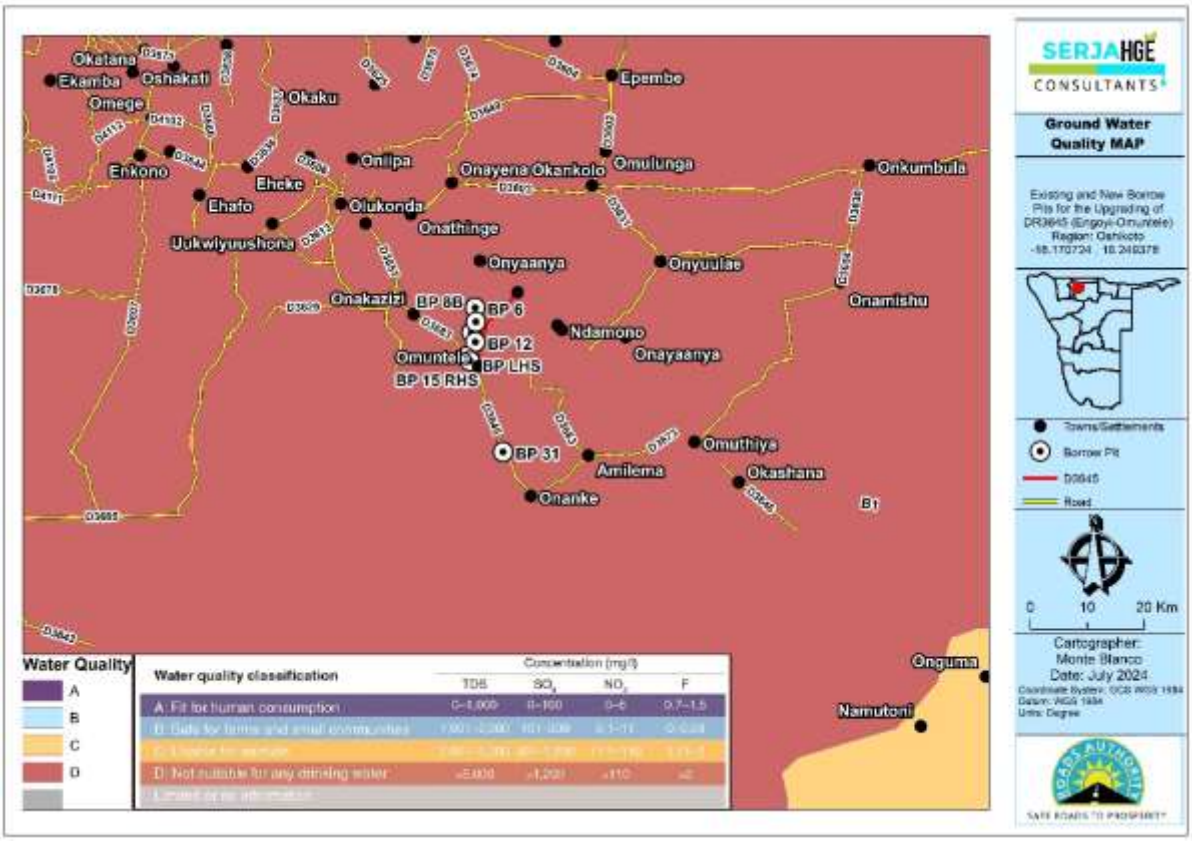


Figure 5-8: Groundwater water quality and suitability to use map of the area

5.3 Social and Economic Environment

5.3.1 Demography

Pending the official results of the 2023 National Population and Housing Census, the City Population (2024) indicates that the population Oshikoto Region stands at 257,302 which is an increase of 2.9% from the 2011 Census by Namibia Statistics Agency (2014) which was recorded at 181,973. The population density is 6,653 people per square kilometer (km^2) (City Population, 2024)

The DR3645 mainly falls within Omuntele Constituency from Omuntele up to until between Ondjamba and Engoyi, while the remainder of the road section falls under Onyaanya Constituency at Engoyi side. Pending the official results for the 2023 National Housing and Population Census, the City Population website (2024) indicated that the population of Omuntele Constituency is 21,043 (10,412 males and 10,631 females) and has a population density of 12.91km^2. Onyaanya Constituency has a population of 25,465 (11,847 males and 13,618 females) and a population density of 34.80km^2.

5.3.2 Economic activities

Oshikoto Region is predominantly communal and rural in character, the administrative centre is Omuthiya and business center is Tsumeb surrounded by commercial farms. In terms of economic activities, the Region is known for its copper mine and copper processing smelter in Tsumeb. According to the Oshikoto Regional Council website (2024a), groundwater which is found in the area of Tsumeb and Oshivelo makes the Oshikoto Region to be a champion of fruits and vegetables production. In terms of agriculture activities, both communal and commercial in the area have opened up a window of hope for crop and livestock farming in the Region.

5.3.2.1 Tourism

Oshikoto Region is home to Etosha National Park which is one of the famous tourist attraction areas which offer tourist and other interested people to view wildlife and the beautiful Andoni Plateau (Oshikoto Regional Council website, 2024a).

From the Constituency level, the following economic activities are in Omuntele and Onyaanya Constituencies.

5.3.2.2 Agriculture and Farming

The Omuntele Constituency thrives on subsistence farming – households depend directly on agriculture for substance where Mahangu (pearl millet) is the main grown crop in the constituency which is a primary agriculture activity along the DR3645 alongside livestock farming with cattle, goats, sheep, donkeys and pigs. According to Oshikoto Regional Council website (2024b), the government is promoting surplus production among subsistence farmers as a means of generating cash income. Most of the livestock farming takes place in Ombuga grassland area.

Furthermore, the development in Omuntele comprises of small-scale businesses as well as government services such as Omuntele Clinic and the MAWLR. The Constituency is popular for its large deposits of salt at Ekango Salt Pan (also known as *Ekango lyomongwa*) which is located about 14 km south of Omuntele administrative center and presents the region with great potential for salt mining and processing (Oshikoto Regional Council, 2024b).

In terms of agricultural activities in Onyaanya Constituency, most inhabitants in Onyaanya constituency are subsistence farmers. Mahangu is the principal crop in Onyaanya constituency and most inhabitants in the constituency depend on livestock and Mahangu for survival (Oshikoto Regional Council, 2024b).

5.3.2.3 Business activities

The majority of businesses in Omuntele include informal traders who sell liquor, basic services as well as agricultural products. With regards to Onyaanya Constituency, Onyaanya Settlement is the constituency's business hub, and the majority of the businesses include liquor wholesale and outlets, foodstuffs, fuel

station, hospitality ventures and informal traders. Most businesses have settled along B1 road forming quite dense concentrations (Oshikoto Regional Council, 2024b).

5.4 Infrastructure and Services

Oshikoto Region has some grave and tarred roads (such as the B1) providing connection to major towns such as Ondangwa and Omuthiya and to the rest of the country.

The summary of current services infrastructure in the project area (Omuntele and Onyaanya Constituencies) include:

- Road network: The gravel road (D3645) provides the surrounding communities to areas such as Engoyi then to Ondangwa and Omuthiya (on the B1). There D3683 from Omuntele to Uukwiyu. The nearby villages are accessed by sandy single-track routes that connect to these grave roads.
- Electricity supply: The communities are in rural areas where most houses use firewood to cook, light and heat water. The major settlements are connected to the NORED power grid and few houses have the privilege of getting connected to the grid and some use solar energy for power supply. Water supply: The community rely on surface water supply which is NamWater operated and facilitated by MAWLR's Rural Water Supply Division. The groundwater quality in the area is very poor and unfit for human consumption due to elevated TDS levels.
- Telecommunication services: The area has good network coverage for MTC and Telecom Namibia.
- Education and health services: Omuntele constituency has a total of 22 schools (1 junior primary, 10 primary schools, 9 combined schools and 2 secondary schools (Oshikoto Regional Council, 2024b)). There are 4 clinics within Omuntele Constituency, and no health center or district hospital.

5.5 Archaeology and Heritage Aspect

5.5.1 Local Perspective and Findings

The expected archaeological and cultural heritages resources in the broader area of the site are graves (marked and unmarked) artefacts, etc. However, none of these had been picked up nor observed at or near the BPs during site visit. However, fenced off cemeteries were observed at Ondjamba and between Ondjamba and Engoyi. Regardless, it is recommended that the National Heritage Act, No. 27 of 2004 should be strictly enforced, and concurrently the recommendation given in the statutory documents for this project should be strictly adhered to.

Furthermore, if a heritage site or items of heritage significance are found in the course of the excavation, then a chance finds procedure should be followed as per the National Heritage Act, No. 27 of 2004.

From a local context, and according to the information provided in the consultation meetings, there are no some known archaeological and heritage resources in the area apart from the cemeteries. However, the community indicated that there may be some unmarked and unknown graves in the area. Therefore, care should be taken during excavation to implement archaeological management and precautionary measures. Thus, ensuring continued protection of the resources during excavations activities in the area.

The public consultation and engagement process and means employed for the EIA Study is presented under Chapter 6.

6 PUBLIC CONSULTATION AND PARTICIPATION PROCESS

Public consultation and participation form an important component of an EIA process. It provides potential Interested and Affected Parties (I&APs) and stakeholders with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process. This greatly assist the EAP (Environmental Consultant) to thoroughly identify and record potential impacts and to what extent further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures. The consultation for this project has been done under the EMA and its EIA Regulations and as per the following subsections.

6.1 Pre-identified and Registered Interested and Affected Parties (I&APs)

Relevant and applicable national, regional, and local authorities, and other interested members of the public were identified. Pre-identified I&APs were contacted directly, while other parties who contacted the Consultant after project advertisement notices in the newspapers, were registered as I&APs upon their request.

6.2 Communication with I&APs, and Means of Consultation Employed

Regulation 21 of the EIA Regulations details the steps to be taken during a public consultation process and these have been used in guiding this process. Communication with I&APs with regards to the project was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the project activities was compiled, uploaded on the MEFT (ECC) Portal for project registration and shared with registered stakeholders / Interested and Affected parties (I&APs).
- A Stakeholders (I&AP)'s List was developed and updated as new I&APs register for the EIA. 120 I&APs were registered – Appendix D. The BID was shared with the pre-identified key stakeholders such as the Oshikoto Regional Council (Onyaanya and Omuntele constituencies), ministries such as Urban & Rural Development, Works & Transport, MEFT's Forestry Directorate, etc.
- Project EIA notices were published in the following newspapers - Appendix E:
    - *New Era*: The notice appeared in the newspaper on the 14th and 21st of June 2024.
    - *Windhoek Observer*: The notice appeared on the 13th, 18th and 21st of June 2024. The consultation period ran from the 13th of June to the 12th of July 2024.

- EIA notices in both English and Oshiwambo languages were prepared for printing in A3 size posters that were pasted at selected points/places along the DR3645, including the constituency offices as shown in Figure 6-1 and copy of the notices are attached hereto as Appendix F.

Figure 6-1: The EIA public notice posters at along the DR3645 major settlements and villages

- Consultation meetings were scheduled and held with the community and local stakeholders (in the area from 03 July to 04 July 2024 - Figure 6-2 and Figure 6-3. The meeting in Onamutayi Village (Onamutenya Area) had 48 attendees, Omuntele 16 attendees, Ondjamba 14 attendees and Engoyi had 14 attendees. The number of attendees includes 3 Serja HGE Consultants and one representative from RCC.

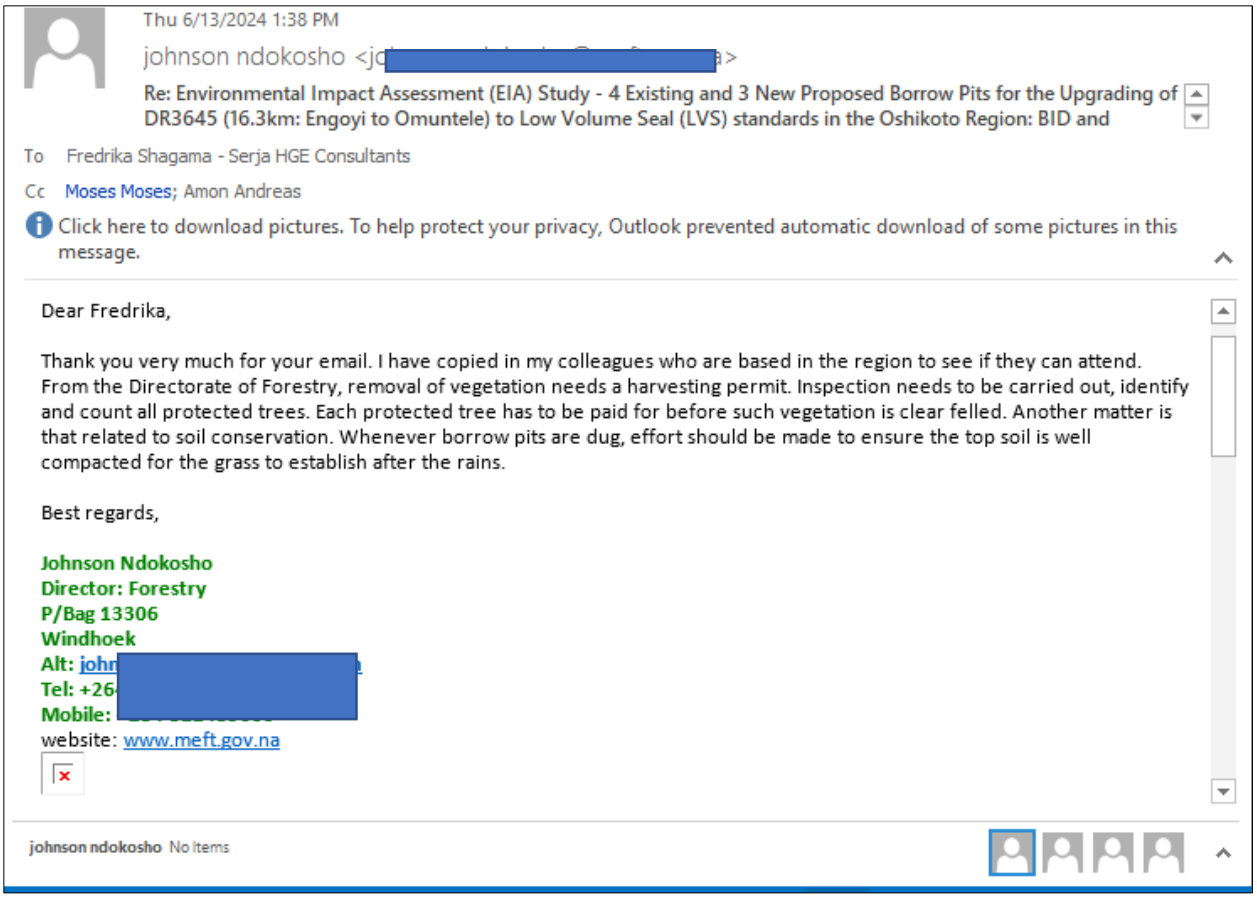
Figure 6-2: Consultation meetings in progress at Onamutenya and Omuntele on the 04th of June 2024

Figure 6-3: Consultation meetings in progress at Ondjamba and Engoyi B on the 04th of July 2024

Minutes were taken from all the meetings, and these are attached hereto as Appendix G.

6.3 Feedback and Issues raised by the Stakeholders (I&APs)

Some issues were raised by I&APs during the consultation period (via email – Figure 6-4 and consultation meetings) and these issues have been recorded and incorporated in the EIA Scoping Report and EMRP.


Thu 6/13/2024 1:38 PM

johnson ndokosho <jo[redacted]a>

Re: Environmental Impact Assessment (EIA) Study - 4 Existing and 3 New Proposed Borrow Pits for the Upgrading of DR3645 (16.3km: Engoyi to Omuntele) to Low Volume Seal (LVS) standards in the Oshikoto Region: BID and

To Fredrika Shagama - Serja HGE Consultants

Cc Moses Moses; Amon Andreas

Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.

Dear Fredrika,

Thank you very much for your email. I have copied in my colleagues who are based in the region to see if they can attend. From the Directorate of Forestry, removal of vegetation needs a harvesting permit. Inspection needs to be carried out, identify and count all protected trees. Each protected tree has to be paid for before such vegetation is clear felled. Another matter is that related to soil conservation. Whenever borrow pits are dug, effort should be made to ensure the top soil is well compacted for the grass to establish after the rains.

Best regards,

Johnson Ndokosho
Director: Forestry
P/Bag 13306
Windhoek
Alt: john[redacted]
Tel: +26[redacted]
Mobile: [redacted]
website: www.meft.gov.na

johnson ndokosho No Items

Figure 6-4: The only email comment received from one stakeholder (I&AP) on 13 June 2024

The summary these few key issues are presented in Table 6-1.

Table 6-1: Summary of main issues and comments received throughout the consultation period

Aspect	Summary of impact or concern
Comments and Issues received or noted during the consultation period (via email before the meetings)	
The loss of floral species (the removal of protected trees) and permitting requirements	''From the Directorate of Forestry, removal of vegetation needs a harvesting permit. Inspection needs to be carried out, identify and count all protected trees. Each protected tree has to be paid for before such vegetation is clear felled.''
Soil conservation owing to physical disturbance (borrow pits activities)	''Soil conservation: whenever borrow pits are dug, effort should be made to ensure the topsoil is well compacted for the grass to establish after the rains.''
Comments and Issues received or noted during the consultation meetings	

Aspect	Summary of impact or concern
Rehabilitation of old/existing as well as new borrow pits	Rehabilitation of existing BP that pose a risk to people and livestock.
The need for social responsibility related to borrow pits (for community use as rainwater holding structures/dams for livestock)	Communities requesting to be assisted with deepening or re-working of existing borrow pits from the construction of DR3645 in 2007 and have been used for livestock watering. Some of the crucial pits have naturally backfilled. Thus, requiring some work.
Recruitment of project personnel (labourers)	The community expressed dissatisfaction with the unfair employment of people at the road (less locals especially the Engoyi side and Onamutenya).
Damaging of local / community access roads	The community access roads are damaged by heavy trucks that transport construction materials from BPs, especially from the BP6 area. This has become difficult for small vehicles and non-4x4 to use these roads.
Air quality and visual (dust generation)	There is an issue of dust generation in the area along the road, especially places like Ondjamba. Dust suppression efforts should be implemented and done regularly for growth centres such as Ondjamba because it gets dusty. This also affects school children while in classrooms. This is an issue of air quality and visual.
Observed issues in the field	
Community safety at or near BPs and the DR3645 itself	Children and some adults standing near the heavy trucks at the BPs claiming to be looking for firewood. Some community members were also seen standing to their friends and or family members who are working on the road. They were informed of the risks and to stay away from road works and BPs. This was also raised in the community meetings for elders/parents to talk to children to stay away from the road.
The issue hauling and loading operators being alone at BPs	This is a concern in case of injuries and there is no one else to attend to them. Frequent site checks by foremen or colleagues? Or perhaps hire neighbours on short-term contracts to check in?
Damaging of community water pipeline across the road due to construction works	Some community members raised an issue of their pipeline inadvertently getting cut or damaged along the road during preparation of the road sites for construction.
Over speeding by project truck drivers	It was observed that some truck drivers and light vehicle drivers are over speeding along the DR3645 despite the current conditions of the road (being under construction) with limited mobility and manoeuvring at some sections. This result in the generation of dust along the road and even on access roads (haul roads) to BPs.

Aspect	Summary of impact or concern
Lack of PPE for some SME workers in the field	Some SME workers did not have PPE, and this was addressed as RCC indicated that they had communicated to that specific SME management to act, and PPE delivery was underway on the same day. The PPE were delivered, and the workers were seen wearing PPE later that day.

The consultation period ran from the 13th of June 2024 to the 12th of July 2024 to allow the submission of comments after the consultation meeting. Comments received during the consultation meetings were as summarized above and indicated in the meeting minutes.

6.3.1 Feedback on the Review of the Draft Scoping Report and EMRP

The draft environmental Scoping Report, environmental management & rehabilitation plan (EMRP) and minutes from the consultation meetings were circulated to the registered stakeholders and I&APs for review and comments on the 22nd of July to the 30th of July 2024 - Figure 6-5. There were no comments received on the documents.

Figure 6-5: The email communication to stakeholders and I&APs for the review and comments on the draft Scoping Report, EMRP and Meeting minutes

6.3.2 Concluding remark on the overall EIA Consultation process and feedback

The comments and issues raised during the consultation period were significant, however, they were submitted as objections that would hinder, halt or terminate the project activities. The stakeholders and I&APs would just like to see improvements made where the project activities are lagging in terms of environmental and social sustainability. More importantly, the I&APs would like to see the implementation of management and mitigation measures to reduce the significance of the impacts while continuing with the road construction works because they need the road to improve their mobility and accessibility to economic and social services centers.

The next chapter (Chapter 7) is the presentation of potential impacts identified, the impact assessment methodology, description of impacts and their assessment.

7 IMPACTS IDENTIFICATION, ASSESSMENT AND MEASURES

7.1 Identification of Potential Impacts

Borrow pits establishment, operations and associated road construction works are usually associated with different potential positive and negative impacts. For an environmental assessment, the focus is placed mainly on the negative impacts that are likely to affect the host environmental and social features. The assessment is done to ensure that these impacts are sufficiently addressed, and adequate mitigation measures are recommended thereto for implementation so that an impact's significance is brought under control, while maximizing the positive impacts. The potential positive and negative impacts that have been identified from the project activities are listed as follow:

7.1.1 Positive impacts (benefits) of borrow pits

- Socio-economic development through temporary job (employment) creation in the area during the road upgrading phase to over 100 people.
- Procurement of local goods and services by small and medium businesses to promote local entrepreneurship empowerment and local economic development.
- The rehabilitated borrow pits can be used as rainwater holding (storage) structures for the community (this was requested by the community during consultation meetings in 2006/2007).

The ultimate long-term benefits of the upgraded road will include:

- Improved accessibility: better roads connections enhance accessibility to remote rural areas, facilitating transportation of goods and services, and access to healthcare and education centres in rural areas.
- Economic development: better roads can stimulate economic growth by attracting investment, promoting tourism, and facilitating the movement of goods and people.
- Safety: upgraded roads with improved design and signage can enhance road safety, reducing the risk of accidents and fatalities.
- Social cohesion: improved connectivity through upgraded roads can strengthen social ties within rural communities by enabling easier access to markets, schools, and healthcare centres and other social services.

7.1.2 Potential environmental and social (adverse) impacts of borrow pits:

- Displacement of properties and or loss of productive to create borrow pits for road upgrade.

- Habitat destruction: Excavation of borrow pits can lead to the destruction of natural habitats for plants and animals. This can disrupt local biodiversity and reduce the availability of resources for animals and people.
- Soil erosion: The removal of large amounts of soil and vegetation from borrow pits can increase the risk of soil erosion, especially during rainfall events in northern Namibia. This erosion can result in sedimentation of nearby water bodies, leading to water quality issues and habitat degradation for aquatic life.
- Lowering of the local groundwater table: Excavation activities may affect the local water table, leading to changes in groundwater levels. This can impact the availability of water for vegetation that rely on groundwater as a water source in the area.
- Noise associated with borrow pits (from heavy machinery and trucks) can disturb locals and animals.
- Occupational and community health and safety risks: The handling of machinery and equipment by workers at the borrow pits may result into injuries and if worse, can lead to fatalities on duty. Not only site workers but to locals such as children who may be curious to see and feel the heavy trucks and big machinery at borrow pit sites near their homes. The unfenced, and un-rehabilitated and deep and steep-sided borrow pits can be a hazard to the communities resulting in accidents such as drowning, especially for children and or livestock if they fall in.
- Impact on air quality: dust and particulate matter generated during excavation of materials (sand and gravel) and transportation can compromise air quality in the surrounding area.
- Disruption of hydrological systems: borrow pits can alter natural drainage patterns, causing changes in surface water flow and potentially exacerbating flooding or drought conditions in the area.
- Land use change: the conversion of natural landscapes into borrow pits can permanently alter landscapes, affecting the aesthetic value of the area.
- Archaeological or cultural heritage impact: the borrow pits may impact local cultural heritage sites or traditional land use practices, potentially leading to social tensions or conflicts.

7.1.3 Associated potential negative impacts of road construction works

Although the borrow pits activities are associated with the road construction, the scope of this EIA Study only covers the borrow pits impacts. Regardless, potential impacts associated with the road construction works have been identified and listed below. The mitigation measures of these impacts are included in the borrow pits' EMRP.

- Soil and water pollution: improper handling of wastewater may lead to pollution of surrounding soils and eventually water resources systems (through wastewater runoff and infiltration).
- General environmental pollution through mishandling of project related waste associated with road upgrading. These waste types include solid (domestic), hazardous (fuels and oils), wastewater, and human waste (sewage).
- Deforestation: road construction may require clearing trees and vegetation along the road or vegetation that fall within the road reserve, leading to habitat loss and potentially contributing to deforestation.
- Air pollution by potential dust from unpaved areas owing to the movement and operation of heavy vehicles and machinery and excavations associated with the road construction.
- Water pollution: runoff from roads can carry pollutants such as oil, salt, and heavy metals into nearby streams and rivers, impacting aquatic ecosystems.
- Occupational and community health and safety: improper handling of materials and equipment may cause health and safety risks to workers and local communities, if no measures are implemented.

The impacts are briefly described and assessed under the next subheadings. The management and mitigation measures are provided in the EMRP for implementation.

7.2 Impact Assessment Methodology

The Environmental Assessment process primarily ensures that potential impacts that may occur from project activity are identified and addressed with environmentally cautious approaches and legal compliance. The impact assessment method used for this project is in accordance with Namibia's Environmental Management Act (No. 7 of 2007) and its Regulations of 2012, as well as the International Finance Corporation (IFC) Performance Standards.

The identified impacts were assessed in terms of scale/extent (spatial scale), duration (temporal scale), magnitude (severity) and probability (likelihood of occurring), as presented in Table 7-1.

To enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable. It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following process will be applied to each potential impact:

- Provision of a brief explanation of the impact,
- Assessment of the pre-mitigation significance of the impact, and

- Description of recommended mitigation measures.

The recommended mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment. The following criteria (in Table 7-1) were applied in this impact assessment:

Table 7-1: Criteria used for impact assessment (extent, duration, intensity and probability)

The Criteria used to assess the potential negative impacts				
Extent or (spatial scale) - extent is an indication of the physical and spatial scale of the impact.				
Low (1)	**Low/Medium (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
Impact is localised within the site boundary: Site only	Impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond site boundary: Regional	Impact extend National or over international boundaries
Duration- Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project				
Low (1)	**Low/Medium (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
Immediate mitigating measures, immediate progress	Impact is quickly reversible, short-term impacts (0-5 years)	Reversible over time; medium term (5-15 years)	Impact is long-term	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources
Intensity, Magnitude / severity - Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. This a qualitative type of criteria				
H-(10)	**M/H-(8)**	**M-(6)**	**M/L-(4)**	**L-(2)**
Very high deterioration, high quantity of deaths, injury of illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	Substantial deterioration, death, illness or injury, loss of habitat / diversity or resource, severe alteration, or disturbance of important processes	Moderate deterioration, discomfort, partial loss of habitat / biodiversity or resource, moderate alteration	Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers	Minor deterioration, nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration.

The Criteria used to assess the potential negative impacts				
Probability of occurrence - Probability describes the likelihood of the impacts occurring. This determination is based on previous experience with similar projects and/or based on professional judgment				
Low (1)	**Medium/Low (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.

7.3 Impact Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact “without mitigation” is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this chapter, for this assessment, the significance of the impact without prescribed mitigation actions was measured.

Once the above factors (Table 7-1) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

SP = (magnitude + duration + scale) x probability

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate, or low significance, based on the following significance rating scale (Table 7-2).

Table 7-2: Impact significance rating scale

Significance	Environmental Significance Points	Colour Code
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L
Neutral	0	N
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M

Significance	Environmental Significance Points	Colour Code
High (negative)	>-60	H

For an impact with a significance rating of high, mitigation measures are recommended to reduce the impact to a low or medium significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period to enable the confirmation of the significance of the impact as low or medium and under control.

The assessment of the project phases is done for both pre-mitigation (before implementing any mitigation) and post-mitigation (after mitigations are implemented). The objective with the mitigation measures is to firstly avoid the risk and if the risk cannot be avoided, mitigation measures to minimize the impact are recommended. Once the mitigation measures have been applied, the identified risk will be of low significance.

7.1 Description and Assessment of Potential Impacts

The potential impacts from the project activities are described and assessed in Table 7-3. The management and mitigation measures in the form of management action plans are provided in the EMP / EMRP.

Table 7-3: The Description and Assessment of the impacts of the borrow pits and associated activities on the biophysical and social environment

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Positive Impacts											
Employment creation	Socio-economic development through temporary job (employment) creation in the area during the road upgrading phase to over 100 people.	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M / H - 4	H - 5	M - 6	H - 5	H - 75
Empowerment of local businesses	Procurement of local goods and services for the project activities by small and medium businesses in the area and Region will promote local entrepreneurship empowerment and local economic development (income generation).	L / M- 2	L / M - 2	L / M - 4	L / M - 2	L - 16	M - 3	M / H - 4	L / M - 4	M / H - 4	M - 44
The rehabilitation of borrow pits for post-activity use	The rehabilitated borrow pits can be used as rain water holding (storage) structures for the community so that the livestock can drink from the sites all year.	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M - 3	M / H - 4	L / M - 4	M / H - 4	H - 75
Negative (Adverse) Impacts											
Physical disturbance to the site soils resulting into erosion	The removal of large amounts of soil and vegetation from borrow pits can increase the risk of soil erosion, especially during rainfall events in northern Namibia. This erosion can result in sedimentation of nearby water bodies, leading to water quality	M - 3	M / H - 4	L / M - 4	M / H - 4	M – 44	L / M - 2	L / M - 2	L / M - 4	L / M - 2	L - 16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	issues and habitat degradation for aquatic life. Furthermore, the movement of heavy vehicles and equipment may lead to compaction of the soils. This will, however, be a short-term and localized impact.										
Property displacement and land loss	The excavation of borrow pits result in the loss of useful communal land. For borrow pits that would be excavated inside private land will result into the loss of productive land and displacement of fence to enable the movement of heavy vehicles.	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16
Habitat destruction	Excavation of borrow pits can lead to the destruction of natural habitats for plants and animals. This can disrupt local biodiversity and reduce the availability of resources for animals and people										
Impact on flora biodiversity	The clearing of sites to establish new borrow pits already and associated access roads, setting up project equipment and machinery would result in the destruction of vegetation and loss of species, especially	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	protected tree species. The sites are strategically located mainly at areas with minimal vegetation or at already disturbed sites where no further vegetation removal is required. Hence, the impact will be localized, site-specific, and therefore manageable.										
Impact on groundwater table: Lowering of the local groundwater table	Excavation activities may affect the local water table, leading to changes in groundwater levels. This can impact the availability of water for vegetation that rely on groundwater as a water source in the area.	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Air Quality: Dust Generation	There is a potential impact of dust (and particulate matter) emanating from excavation activities, heavy vehicles moving on site access and haul roads when transporting materials from borrow pit sites and travelling to site. This may contribute to the dust level and compromise air quality in the area. The impact is considered short-term and localized as borrow pit activities are carried over a specified	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	durations at selected sites only. Therefore, manageable with mitigation measures.										
Noise	Noise associated with borrow pits (from heavy machinery and trucks) can disturb locals and animals. There is a potential of noise from excavation activities as well as the movement of heavy vehicles (trucks) to and from borrow pits, which may be a nuisance to communities and animals (livestock) in the area. Excessive noise without any protective measures in place can be also a health risk to workers at sites. The activities are considered small to medium scale and the noise level is bound to be limited to the site and some distance from homestead. Thus, the impact likelihood is minimal.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16
Disruption of hydrological systems	Borrow pits can alter natural drainage patterns, causing changes in surface water flow and potentially exacerbating flooding or drought conditions in the area.		M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Soil and Water Resources Pollution	The project activities are associated with a variety of potential pollution sources (i.e., lubricants, and fuel) that may contaminate/pollute soils and eventually groundwater and surface water (such as nearby streams), if not handled properly. The anticipated potential source of pollution to water resources from the project activities would be accidental spills of fuels and oil from project vehicles and machinery. This impact would occur during heavy rainy season when surface runoff would be inevitable. However, it should be noted that the scale and footprints of the activities where potential sources of pollution will be handled is small. Therefore, the impact will be moderately low and manageable.	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16
Waste Generation (Environmental pollution)	Waste types such as solid, wastewater and hazardous (waste fuels and oils) will be produced during project activities. If the generated waste is not disposed of in a responsible way, land pollution	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L - 1	L - 1	L - 2	L / M - 2	L - 8

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	may occur at or around the borrow pit sites. If solid waste such as papers and plastics are not properly stored or just thrown into the environment (littering), these may be consumed by livestock which could be detrimental to their health.										
Occupational and Community Health and Safety Risks	The mishandling of machinery and equipment by workers at the borrow pits may result into injuries and if worse, can lead to fatalities on duty. The curiosity of local children may force them to go and play with unattended heavy trucks and big machinery at borrow pit sites near their homes. The unfenced, and un-rehabilitated and deep and steep-sided borrow pits can be a hazard to the communities (people and livestock). The deep and steep-sided borrow pits can cause accidents such as drowning, especially for children or livestock if they fall in. If not properly managed, borrow pits can fill with water, creating stagnant pools. These pools can	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	become breeding grounds for mosquitoes and other vectors of diseases like malaria and dengue fever, increasing health risks for nearby communities and livestock.										
Accidental fire outbreaks	The use of heavy equipment, especially if there is a presence of hydrocarbons at borrow pits sites may result in accidental fire outbreaks. This could pose a safety risk to the project personnel (workers) and locals.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Vehicular Traffic Safety	The local roads such as DR3645 and DR3683 are the main transportation routes for all vehicular movement in the area. There would be a potential increase in traffic flow owing to the transportation of construction materials from borrow pits. Not only materials transport, but also delivery of supplies, goods and services to the sites and road itself. Depending on the project needs, trucks, medium and small vehicles will be frequenting the borrow pit site areas. This would potentially increase slow moving	M - 3	M / H - 4	L / M - 4	M / H - 4	M - 44	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	heavy vehicular traffic along these roads, which could results in road accidents.										
Impact on local road use	The movement of heavy trucks on the community roads (single-track sandy routes) would result in the deterioration of these roads making it difficult for community small vehicles from using them again, due to worsened road conditions. This is a concern, if maintenance or leveling of these ''haul'' roads is not done.	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L - 1	L - 1	M / L - 4	M / L -2	L - 12
Land use change	The conversion of natural landscapes into borrow pits can permanently alter landscapes, affecting the aesthetic value of the area.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L - 1	L / M - 2	L - 2	L / M -2	L - 10
Archaeological or cultural heritage impact	The borrow pits may impact local cultural heritage sites or traditional land use practices, potentially leading to social tensions or conflicts. The excavation of borrow pits at new sites or expansion of existing borrow pits may result into the inadvertent unearthing of unknown and unmarked graves	M - 3	M - 3	M - 6	M / H - 4	M – 48	L - 1	L / M - 2	L - 2	L / M -2	L - 10

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	in the area, if there are any. There has not been reports of such incidents yet (with existing and new sites). Therefore, the impact significance will be reduced to a lower rating.										

7.2 Cumulative Impacts Associated with the Borrow Pits

According to the International Finance Corporation (2013), cumulative impacts are defined as "those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to in this document as "developments") when added to other existing, planned, and/or reasonably anticipated future ones". The main cumulative impact to which the project and associated activities potentially contribute are the:

- Impact on community roads (sandy-single track routes and paths used by the community and small cars): The activities associated with borrow pits activities such as the movement of heavy truck to the borrow pit sites and transporting the materials from the borrow pits to the road. The heavy trucks damages these roads making them difficult or impossible to be used by small cars and non-4x4 vehicles. There is also movement of other vehicles on the DR3645 and DR3683 and combined with the project related vehicles, there is an increased flow of vehicle traffic in the area including unpaved community roads. The management and mitigation measures are provided in the EMRP.
- Impact of un-rehabilitated borrow pits on the community and livestock: Un-rehabilitated borrow pits can pose threats to the community, especially children who may play around these sites during rainy seasons and drown when the pits are filled with water Furthermore, deep and steep-sided borrow pits can cause accidents such as drowning, especially for children or livestock if they fall in the borrow pits.

  Borrow pits that are not rehabilitated or not rehabilitated properly can cause conflicts and disputes in communities over their post-activity land uses, for instance, some community members may opt to have the borrow pit left for community rainwater storage and some may opt to have it completely backfilled because they consider it unsafe or risky. These community conflicts over borrow pits can strain or damage community relations and local governance over a long time, if remain unresolved. In some cases, community members tend to gang up against their leaders (village headmen) over issues in their villages. Therefore, it is important for traditional authorities, communities and project contractors to come together and correctively decide on the way forward about the end use of borrow pits in the areas.
- Visual (aesthetic and recreational impact): the borrow pits that may be left un-rehabilitated can be eyesores and diminish the aesthetic value of the surrounding area. Therefore, appropriate measures should be implemented to reduce the impact' significance.

The recommendations and conclusion made for the EIA Study are presented under the next chapter.

8 RECOMMENDATIONS AND CONCLUSIONS

The EIA Study for the DR3645 borrow pits was done in accordance with the EMA No. 7 of 2007 and its 2012 EIA Regulations and all the due processes were followed.

Some key potential positive and negative impacts were identified by the Environmental Consultant and based on issues raised by I&APs during the consultation period. The issues raised by I&APs were addressed and incorporated into this Report whereby mitigation measures have been provided in the Environmental Management & Rehabilitation Plant (EMRP for implementation to avoid and/or minimize their significance on the environmental and social components.

Impact Assessment: The key negative impacts were described, assessed. The potential negative impacts indicated a medium rating significance. To minimize the significance, appropriate management and mitigation measures made thereof for implementation by the Proponent, their contractors, and workers to avoid and/or minimize their significance on the environmental and social components. The effective implementation of the recommended management and mitigation measures accompanied by monitoring will particularly see the reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low).

8.1 Recommendations

The EIA Study was deemed sufficient and concluded that no further detailed assessments are required towards the ECC application for the road construction's borrow pits.

Serja Consultants are confident that the potential negative impacts associated with the project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures and with more effort and commitment put on monitoring the implementation of these measures. It is therefore, recommended that the borrow pits be granted an ECC, and provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.
- All required permits, licenses and approvals for the activities are obtained as required. These include permits and licenses and ensuring compliance with these specific legal requirements.
- Transparency in communication and continued engagement with the communities and or through their leaders (local leaders / headmen), and stakeholders should be maintained throughout the project cycle.
- The Proponent, their project workers and contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by issuing authorities.

- Site areas where excavations were carried out and have ceased are rehabilitated, as far as practicable, to their pre-excavation state. This includes the levelling of stockpiled topsoil, backfilling trenches and closing/capping of project associated holes.
- The EMRP implementation should be checked and done by the responsible team member onsite (Environmental Control Officer / Safety Officer), and audited by an Independent Environmental Consultant on a bi-Annual basis to compile Environmental Monitoring (audit) reports. These reports are to be submitted to the Environmental Commissioner at the DEAF – This will be required by the Environmental Commissioner (as part of the ECC conditions).

8.2 Recommendations and Conclusions

In conclusion, although significant, the identified impacts would not hinder the project activities. However, the recommended measures should be effectively implemented and monitored to ensure that the significance of adverse impacts is reduced to low where it is medium and eventually to negligible significance rating. The effectiveness of the implementation of the management and mitigation measures and EMP compliance will be done by an Environmental Control Officer (ECO) or Safety Officer and audited by an Independent Environmental Consultant on a bi-annual basis. This is to ensure that EMRP implementation can be tracked via Bi-Annual Environmental Monitoring exercises and documented in the monitoring reports to the Environmental Commissioner. The monitoring of EMRP implementation will not only be done to ensure that the impacts significance is reducing and or maintain low significance rating but to also ensure that all potential unforeseen impacts that might arise during implementation are properly identified in time and addressed immediately.

9 LIST OF REFERENCES

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