Reconnaissance Energy Namibia (Pty) Ltd

Final Environmental Management Plan (EMP) Report to Support the Applications for the Renewal and Amendment of the Environmental Clearance Certificate (ECC) for the Proposed Seismic Survey Operations in the Petroleum Exploration License (PEL) No. 73, Kavango Sedimentary Basin (KSB),
Kavango West and East Regions, Northern Namibia

PROPONENT ADDRESS

Erf No. 08 AMTA Building
Industrial Area
P. O. Box 2992
Rundu, Kavango East Region

July 2024

OPERATOR

Reconnaissance Energy Namibia (REN) (Pty) Ltd Subsidiary of
Reconnaissance Energy Africa (ReconAfrica) Ltd

ENVIRONMENTAL CLEARANCE CERTIFICATE (ECC) REFERENCE Nos.

ECC No. 01491

1st Granted 2nd July 2021 and Expired on the 2nd July 2024

LICENSE PEL 73

Covering Parts of the Degree Square Blocks Nos. 1819, 1820, 1821,1719, 1720, and 1721

WORKING INTERESTS

REN owns 90%

National Petroleum Corporation of Namibia (NAMCOR)
(A State-Owned Company) 10% with costs carried to the development stage

TYPE OF PETROLEUM EXPLORATION ACTIVITIES

2D and 3D Seismic Proposed Seismic Survey Operations Using either Explorer 860 and Vibroseis Trucks

PROPONENT NAMIBIAN ADDRESS

Erf No. 08 AMTA Building
Industrial Area
P.O. Box 299,
Rundu, Kavango East Region

PROPONENT OVERSEAS ADDRESS

Berkeley Square House, Berkeley Square
London UK W1J 6BD
UNITED KINGDOM

ENVIRONMENTAL CONSULTANTS

Risk-Based Solutions (RBS) CC
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Windhoek Central Business District (CBD)
P. O. Box 1839, **WINDHOEK**, **NAMIBIA**
Tel: +264 - 61- 306058/224780/236598; Fax: +264-61-245001
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Global Office / **URL**: www.rbs.com.na

ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Dr Sindila Mwiya (*PhD, PG Cert/ MPhil, BEng (Hons), Pr Eng*)

CITATION: ***Risk-Based Solutions (RBS), 2024***. *Final Environmental Management Plan (EMP) Report prepared to support the Applications for the Renewal and Amendment of the Seismic Survey Environmental Clearance Certificate* (ECC) No. 01491 *covering the Area of Interest (AOI) in the Petroleum Exploration License (PEL) No. 73, Kavango Sedimentary Basin, Kavango West and East Regions, Northern Namibia.*

DR SINDILA MWIYA, ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)
DECLARATION

I, Dr Sindila Mwiya, the EAP for the preparation of this Environmental Management Plan (EMP) Report prepared to support the application for the renewal and amendment of the seismic survey Environmental Clearance Certificate (ECC) No. 01491 granted by the Environmental Commissioner (EC) in the Ministry of Environment, Forestry and Tourism (MEFT) on the 2nd July 2021 and expired on the 2nd July 2024 covering the Area of Interest (AOI) in the Petroleum Exploration License (PEL) No. 73, Kavango Sedimentary Basin, Kavango West and East Regions, Northern Namibia for Reconnaissance Energy Namibia (Pty) Ltd (Proponent), hereby declares that:

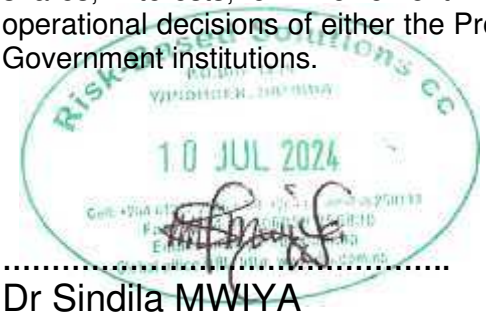
1. This Environmental Management Plan (EMP) Report has been prepared in accordance with the provisions of the Environmental Protection Clause 11 of the Model Petroleum Agreement, Petroleum (Exploration and Production), 1991, (Act No. 2 of 1991), Petroleum Laws Amendment Act, 1998, (Act 24 of 1998), the Environmental Management Act, 2007, (Act No. 7 of 2007), all other applicable national laws, Regulations and Conditions of the Environmental Clearance Certificate (ECC) granted on 2nd July 2021 for 2D seismic survey operations in PEL No. 73.

2. As an EAP for this Project, I am highly qualified and experienced in onshore oil and gas exploration and production operations and hold a PhD with research interests, technical academic training, and technical knowledge in Engineering Geology, Geotechnical, Geoenvironmental and Environmental Engineering, Artificial Intelligence and Knowledge-Based Systems with special focus on Environmental Impact Assessments (EIAs), Environmental Management Plans (EMPs), Environmental Management Systems (EMSs), Strategic Environmental Assessments (SEAs) and Strategic Environmental Management Plans (SEMPs) with respect to subsurface resources (minerals, petroleum, water) and energy in Arid and Semiarid Environments.

3. I am an **Engineering and Environmental Geologist** and I have more than twenty (20) years of extensive technical knowledge and field-based experience in conducting environmental assessments, management, and monitoring, for onshore and offshore subsurface resources (minerals, petroleum, water) and energy and I have undertaken more than 300 projects since 2004, including more than 100 onshore and onshore oil and gas exploration and production related technical permitting and de-risking advise, environmental assessments, management, and monitoring projects supports in different parts of the World including Namibia.

4. I have performed the work relating to this project in an objective manner, even if the outcomes will result in views or Records of Decision that may not be favourable to the Stakeholders or the Proponent, and.

5. I am an independent consultant not related to the Proponent, I co-own and operate an independent company (Risk-Based Solutions CC) which is not related to the Proponent. Except for the fees payable for professional consulting services rendered to the Proponent, I have no shares, interests, or involvement in the license, financial or other affairs or business or operational decisions of either the Proponent or the decision-making structures of the relevant Government institutions.



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Dr Sindila MWIYA
Environmental Assessment Practitioner (EAP)
RISK-BASED SOLUTIONS (RBS) CC

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NON-TECHNICAL SUMMARY

Reconnaissance Energy Namibia ("**REN**") (Pty) Ltd, (the **"Proponent"**), is proposing to conduct the 2024 and 2025 2D/3D seismic survey operations over the Area of Interest (AOI) in the Petroleum Exploration License (PEL) No. 73, Kavango Sedimentary Basin, Kavango West and East Regions, Northern Namibia. The Proponent is a subsidiary of Reconnaissance Energy Africa Ltd (ReconAfrica), a Canadian publicly listed company focused on the exploration and development of oil and gas resources in Namibia and Botswana. The Proponent holds petroleum exploration rights under the PEL No. covering parts of the Degree Square Blocks Nos. 1819, 1820, 1821, 1719, 1720, and 1721 over the newly discovered KSB in Kavango West and East Regions in northern Namibia. PEL 73 was granted by the Ministry of Mines and Energy (MME) under Section 29-38 of the Petroleum (Exploration and Production), 1991, (Act No. 2 of 1991).

REN is the Operator of PEL 73 holding 90% of the license interests and the remaining 10% is held by the National Petroleum Corporation of Namibia (NAMCOR), a State-owned company with its costs carried to the development stage. As part of the provisions of the Petroleum Agreement signed between REN and the Government of the Republic of Namibia represented by the Ministry of Mines and Energy (MME), the Proponent has committed to undertaking petroleum exploration activities in PEL 73. The Petroleum Agreement provides for an initial exploration period (4 years), first and second two (2) years renewal exploration periods subject to possible one-year extension. In an event of a commercial discovery of economic oil and gas reserves, the Proponent may apply for a 25-year production license, which should be granted within six (6) months of the date of application.

The Proponent is proposing to conduct 2024 and 2025 2D/3D seismic survey operations as part of the ongoing petroleum exploration activities in PEL 73. The following is a summary of the proposed 2024 and 2025 2D/3D seismic survey operations:

1) Proposed 2024 2D seismic survey operations: Survey test that will be undertaken using the Vibroseis trucks along the test lines Nos. 21-08 and 22-05, previously surveyed using the Explorer 860. The objective of the proposed 2024 2D seismic survey test is to compare the subsurface imaging results of the Explorer 860 and Vibroseis and selected the best option for potential future 2D and / or 3D seismic surveys operations in PEL 73, and.

2) The proposed 2025 2D / 3D seismic survey: Comprise 657 linear km of 2D or alternatively ~388 km^2 area of 3D seismic survey coverage area.

The proposed 2024 and 2025 2D/3D seismic survey lines fall within the AOI covered by the previous environmental assessment studies for the completed Phases I, II and III 2D seismic surveys operations. The objectives of the proposed 2024 and 2025 2D/3D seismic survey are: Expand the overall seismic survey data coverage over the AOI in the licensed area and enhance the interpretation contrast, confidence, and overall quality of the results. Interpreted seismic survey data sets can be used to explain subsurface discontinuities, layering, and probable rocks/structures. The data sets are highly useful not only for petroleum exploration operation but also for the investigation of coal and massive metallic minerals deposits, oil and gas, groundwater, and geotechnical engineering site assessments. In oil and gas exploration, seismic data sets are used to accurately identify locations for drilling exploration wells, reducing the probability of drilling dry wells and consequently the need for further drilling, minimising the environmental impact of the oil and gas exploration.

As part of the ongoing petroleum exploration operations for PEL 73, the Proponent intends to conduct 2024 and 2025 2D/3D seismic survey operations using Vibroseis trucks. The 2024 2D seismic surveys tests will be undertaken using the Vibroseis trucks along the test lines Nos. 21-08 and 22-05, previously surveyed using the Explorer 860. The proposed test lines No. 21-08 and 22-05 follows the existing D3447 Road and existing access respectively. The objective of the proposed 2024 2D seismic survey test is to compare the subsurface imaging results of the Explorer 860 and Vibroseis and selected the best option for potential future 2D and / or 3D seismic surveys operations in PEL 73. The proposed 2025 2D or 3D seismic survey area which is subject to the positive outcomes of the ongoing exploration operations and 2024 2D seismic survey tests results cover the local communal land around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563,

and 1564. The proposed 2025 2D seismic survey will have 657 linear km or alternatively ~388 km^2 area of 3D seismic survey coverage area.

The proposed 2024 and 2025 2D/3D seismic survey operations cannot be undertaken without a valid Environmental Clearance Certificate (ECC) issued by the Environmental Commissioner (EC) in the Ministry of Environment, Forestry and Tourism (MEFT) as provided for in the Environmental Management Act (EMA), 2007, (Act No. 7 of 2007) and Environmental Impact Assessment (EIA) Regulations, 2010. Currently, the Proponent holds an ECC No. 01491 that was granted by the EC in the MEFT on the 2nd July 2021 and expired on the 2nd July 2024. The current expired ECC No. 01491 covers the proposed 2024 and 2025 2D/3D seismic survey areas. To conduct the proposed 2024 and 2024 2D and 3D seismic survey activities, the current ECC No. 01491 need to be renewed and amended. Although the proponent intends to conduct the proposed 2024 and 2025 2D/3D seismic survey operations using Vibroseis trucks, the EIA Report and this Environmental Management Plan (EMP) Report prepared to support the applications for the renewal and amendment of the ECC No. 01491 provide for the use of either the Vibroseis or Explorer 860 as the energy source.

The Environmental Impact Assessment (EIA) process undertaken for the ECC No. 01491 renewal and amendment applications as detailed in the EIA Report, focused on the assessment of the various components of the receiving environment with respect to the equipment to be used and local community inputs from consultations and engagements undertaken. The assessment process took into consideration, all the applicable national regulations, the corporate requirements of the Proponent, oil and gas exploration and environmental assessment international best practices, and sensitivity of the receiving environment (physical, biological, socioeconomic and ecosystem services and functions). The following is the summary of the key sources of positive and negative impacts likely to be associated with the proposed 2024 and 2025 2D/3D seismic survey operations:

(i) Planning and mobilisation (Pre-survey preparation, field scouting and mapping of buffers and offsets along proposed survey lines).

(ii) Base camp and fly-camps site setups and operations.

(iii) Widening of tracks by pruning vegetation overgrowth and tracks levelling as may be applicable.

(iv) Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access especially for the proposed possible 2025 2D/3D seismic survey operations.

(v) Actual survey operation (data acquisition).

(vi) Demobilisation and closure (Survey Completion), and.

(vii) Any accidental event that may be associated with the routine and physical presence operational activities.

Onshore 2D or 3D seismic survey operations seismic is a nonintrusive high-tech survey method that can be used in sensitive and urban locations without damaging buildings or affecting any receiving environmental components because the level of ground displacement due to the 2D or 3D seismic wave is insignificant compared to the earthquake generated seismic wave which sometimes results in significant infrastructure damage especially the old and poorly engineered infrastructures. Earthquake generated seismic waves have periods, and wavelengths that are in minutes and kilometres, respectively, while the 2D/3D onshore petroleum exploration seismic survey operations produce waves with periods, and wavelengths of tenths of a second and tens of a meter, respectively. Therefore, the level of ground displacement associated with the type of waves generated by an onshore seismic survey operation compared to an earthquake event, differs considerably. Earthquake ground displacement are in meters and can result in weak buildings collapsing while the millimetre / few centimetres onshore

seismic survey operations ground displacement will generally have negligible effect on the buildings. Ground motion caused by an onshore seismic survey vibration is generally barely perceivable. The further away one is from the source, the less one would feel the vibration. Studies have shown that common household activities such as hammering a nail into a wall or construction site soil compactions or rock breaking processes would cause more vibration to a house than a typical seismic truck operating in the local area.

Noise and vibration from a 2D or 3D seismic survey may only interfere with the vocalisation of elephants if the noise and vibration waves have the same frequencies as that of the elephants resulting in frequencies interferences. Interference is defined as the effect produced when two waves of the same frequency, amplitude and wavelength travelling in the same direction in a medium are superposed (i.e as they simultaneously pass-through a given point). When the crest of two waves of equal wavelength is together, the waves are said to be in phase, that is, they have a phase difference of zero. In this case, according to the principle of linear superposition, the waves will reinforce each other, or add up and will undergo constructive interference and thus affect elephant vocalisation. On the other hand, if two waves superimpose with each other in opposite phase, the amplitude of the resultant is equal to the difference in amplitude of individual waves, resulting in the minimum intensity of the wave. This is known as destructive interference and thus will produce a negligible effect on elephant vocalisations.

Latest broadband Vibroseis such as the Nomads have selectable frequency ranging from 1 to 250 Hz. The rear mounted weight-drop from the Explorer 860 will generate acoustics or sound waves with frequency of between 1 to 300 Hz for 50% and 100% peak force, respectively. Vibroseis trucks especially the recently designed broadband units have greater advantage in energy spectrum control as this can be done with much ease. The force applied to the ground can be monitored and adjusted in real time. Hence the effective usage of Vibroseis in urban areas or sensitive environments. With enhanced mechanical and hydraulic components and shaker redesign, latest Vibroseis such as the Nomad 65 with similar specs to the Explorer 360 has a superior performance of optimised broadband acquisition by bringing down the sweep start's frequency at full drive from 7 to 5.4Hz. Therefore, the time spent in emitting the very low frequencies from 1Hz can be significantly reduced, with a positive impact on crew production and cost. New technologies in Vibrioses such as the Nomad 65 will facilitate the recording of an extra low frequency bandwidth that has proved to be very beneficial for vertical resolution and seismic inversion. Typical exploration seismology Vibroseis sweeps are in the range of ~2 to 100 Hz.

The operation is unlikely to affect the local fauna based on the results of the monitoring activities undertaken for the Phases I, II and III 2D seismic surveys operations. During the Phases I, II and III 2D seismic surveys operations, REN employed a field-based wildlife expert to monitor wildlife activities with respect to the survey activities along the various seismic survey lines before, during and after the survey operations. The monitoring results have concluded that seismic surveys did not in any way adversely affect the fauna within PEL 73. The operational frequencies can be pre-set to avoid any interferences with the receiving local environment such as the elephants known to have limited communication frequency ranging between 15-35Hz, and be accommodated within the available seismic survey frequency options. Hence, an insignificant interference.

Based on the results of the EIAs for several previous onshore 2D seismic surveys that have been conducted globally as well as in Namibia including those undertaken in recent years in the Nama Basin near Maltahöhe in southern Namibia in 2007 and south of Nkurenkuru in Kavango West Region in 2017 as well as the completed Phases I, II and III and 2D seismic survey operations in PEL 73 supported by wildlife monitoring before, during and after the survey, no significant negative environmental impacts have been observed and reported on all the various sensitive components of the receiving environment.

This EMP Report contains all mitigation measures that have been recommended based on the findings of the EIA Report. Through the effective implementation of the mitigation measures and performance monitoring by the Proponent as detailed in this EMP Report, the overall likely negative impacts the proposed 2024 and 2025 2D/3D seismic survey activities on the receiving environment (physical, socioeconomic, and biological) will be low and localised with medium to low significant negative impacts. The process of cutting the new cutlines to be used for seismic data acquisition within community forests will be localised with medium to low significant negative impacts on the forest habitats without mitigation. Direct supervision, involvement, and continuous monitoring of the process

of creating new accesses or cutlines by the Contractor, Proponent, MEFT, community forest personnel, and framers will reduce any likely medium significant negative impacts to low.

Namibia does not have standards / guidelines on onshore seismic survey exclusion / buffer distances around the receiving environment's sensitive receptors. The completed Phases I, II and III 2D seismic survey have been undertaken in line with the International Association of Geophysical Contractors (IAGC) and the Distance Requirements Exploration Directive 2006-15, Alberta Government, Canada guidelines with respect to the buffer or exclusion zones around structures such as houses, boreholes, pipelines, dams, and cemetery/ traditional burial grounds. Similar exclusion zones will be implemented as part of the operational practices for the proposed 2024 and 2025 2D/3D seismic survey operations in addition to the adoption of the appropriated reduced-force sweeps and application of the approved and modified safe operating distances.

Based on the findings of the EIA Report and the recommended mitigation measures detailed in this EMP Report, it is hereby recommended that the applications for the renewal and amendment of the ECC No. 01491 with respect to the proposed 2024 and 2025 2D/3D seismic survey operations over the key Areas of Interest (AOI) in PEL No. 73 shall be granted with the following key conditions:

1) The proposed 2024 and 2025 2D/3D seismic survey operations shall be undertaken in line with the provisions of the EMP, conditions of the renewed and amended ECC if granted by the Environmental Commissioner, and in addition to other national and international environmental best practices, standards, and guidelines.

2) The Proponent shall adhere to the provisions of all the national legislation, regulations, policies, procedures, permits / authorisation requirements provisions of the approved EMP with respect to the proposed 2024 and 2025 2D/3D seismic survey.

3) Mitigation measures as detailed in this EMP for the proposed 2024 and 2025 2D/3D seismic survey shall be implemented, monitored and reported to the regulators as may be applicable or required by law.

4) Before the implementation of the proposed 2024 and 2025 2D/3D seismic survey operations, the Proponent shall consult with the local community / owners of the communal fields and villages that may be affected or likely to be disturbed by the proposed project activities. All the consultations and engagements shall be undertaken through the existing regional and local structures starting with the Office of the Governors for Kavango West and East Regions, Councillors, Traditional Authorities, Village Headpersons, and Village Development Committees (VDCs) and local community levels.

5) Before any form of field-based activities are started in a local area, written consent shall always be obtained from the land owners / local community through the village headperson, traditional authorities, and regional council as may be applicable to avoid misunderstanding and unnecessary conflicts.

6) Appropriate setback distances (exclusion zones) around sensitive structures such as villages, boreholes, water wells, dams, pipelines, burial grounds, cultural sites, irrigation canals and monuments / archaeological resources sites shall always be observed as provided for by the International Association of Geophysical Contractors (IAGC) the Distance Requirements Exploration Directive 2006-15, Alberta Government, Canada guidelines, and.

7) Precautionary principles / approaches shall always be exercised especially in situations where specific mitigations, regulatory guidelines, standards, or appropriate setback distances (exclusion zones) around sensitive local cultural resources such as burial or cultural sites have not been provided. Local communities shall always be consulted on matters related to sensitive local cultural resources not provided for in the international guidelines / standards.

The Proponent shall incorporate the provisions of this EMP in the Environmental Management System (EMS) in line with the Environmental Policy of the company. The Proponent shall implement precautionary measures / approach to environmental management.

All the responsibilities to ensure that the recommendations are executed accordingly, rest with the Proponent. Reconnaissance Energy Namibia (Pty) Ltd as the Proponent and operator shall provide all appropriate human and financial resources necessary for the effective implementation and monitoring of this EMP. It is the responsibility of the Proponent to make sure that all members of the workforce including contractors and subcontractors are aware of the EMP provisions and its overall objectives.

This EMP Report has been prepared in line with the contractual provisions of the Environmental Protection Clause 11 of the Petroleum Agreement and the legal provisions of the Petroleum (Exploration and Production), 1991, (Act No. 2 of 1991), and the Petroleum Laws Amendment Act, 1998, (Act 24 of 1998), the Environmental Management Act, 2007, (Act No. 7 of 2007) and Environmental Impact Assessment (EIA) Regulations, 2012 as well as the corporate requirements of the Proponent.

1. BACKGROUND TO THE PROJECT

1.1 Introduction

Reconnaissance Energy Namibia (Pty) Ltd, herein referred to as REN holds petroleum exploration rights under the Petroleum Exploration License (PEL) No. 73 covering Degree Square Blocks 1719, 1720, 1721, 1819, 1820 and 1821 in Kavango Sedimentary Basin, Kavango West and East Regions, northern Namibia (Figs. 1.1 and 1.2). PEL 73 has been granted under Section 29-38 of the Petroleum (Exploration and Production), 1991, (Act No. 2 of 1991) administered by the Ministry of Mines and Energy (MME) as the Competent Authority.

REN is a subsidiary of Reconnaissance Energy Africa Ltd (ReconAfrica), a Canadian public listed company. REN is the Operator of PEL 73 holding 90% of the license interests. The National Petroleum Corporation of Namibia (NAMCOR), a Namibian State-owned company (Parastatal) holds the remaining 10% interest in the Licence, with its costs carried to the development stage.

1.2 2024 and 2025 2D/3D Seismic Survey Operations

The Proponent is proposing to conduct 2024 and 2025 2D/3D seismic survey operations as part of the ongoing petroleum exploration activities in PEL 73. The following is a summary of the proposed 2024 and 2025 2D/3D seismic survey operations (Fis. 1.3 and 1.4):

1) Proposed 2024 2D seismic survey operations: Survey test that will be undertaken using the Vibroseis trucks along the test lines Nos. 21-08 and 22-05, previously surveyed using the Explorer 860. The objective of the proposed 2024 2D seismic survey test is to compare the subsurface imaging results of the Explorer 860 and Vibroseis and selected the best option for potential future 2D and / or 3D seismic surveys operations in PEL 73.

2) The proposed 2025 2D / 3D seismic survey: Comprise 657 linear km of 2D or alternatively ~388 km^2 area of 3D seismic survey coverage area.

Currently, the Proponent holds an Environmental Clearance Certificate (ECC) No. 01491 for 2D seismic survey operations that was granted on the 2nd July 2021 and expired on the 2nd July 2024 and need to be renewed and amended to align it with the proposed 2024, 2025 and future 2D/3D seismic survey operations in PEL 73 (Fig. 1.5 and 1.6). The proposed 2024 and 2025 2D/3D seismic survey operational area falls within the same area already covered by the previous multiple seismic surveys (Phases I, II, III) EIA studies and monitoring activities undertaken from 2021-2023 and the MEFT defined operational area ABCDE (Fig. 1.6).

The ECC No. 01491 was granted by the Environmental Commissioner (EC) in the Ministry of Environment, Forestry and Tourism (MEFT) as provided for in the Environmental Management Act (EMA), 2007, (Act No. 7 of 2007) and Environmental Impact Assessment (EIA) Regulations, 2010. The current expired ECC No. 01491 covers the proposed 2024 and 2025 2D/3D seismic survey areas falling within the MEFT defined operational area ABCDE (Figs. 1.5 and 1.6). Although the proponent intends to conduct the 2024 and 2025 2D/3D seismic survey operations using Vibroseis trucks, the EIA Report, this EMP Report and the applications for the renewal and amendment of the ECC No. 01491 for the overall seismic survey operation in PEL 73 shall provide for the use of both Vibroseis and Explorer 860.

This Environmental Management Plan (EMP) Report detailing the mitigation measure for all the likely significant positive and negative impacts as identified and assessed in the Environmental Impact Assessment (EIA) Report, has been prepared to support the applications for the renewal and amendment of the ECC No. 01491.

The mitigation measures detailed in this EMP Report took into consideration, findings and recommendations of the EIA Report, all the applicable national regulations, the corporate requirements of the Proponent, oil and gas exploration and environmental assessment international best practices, and sensitivity of the receiving environment (physical, biological, socioeconomic and ecosystem services and functions).

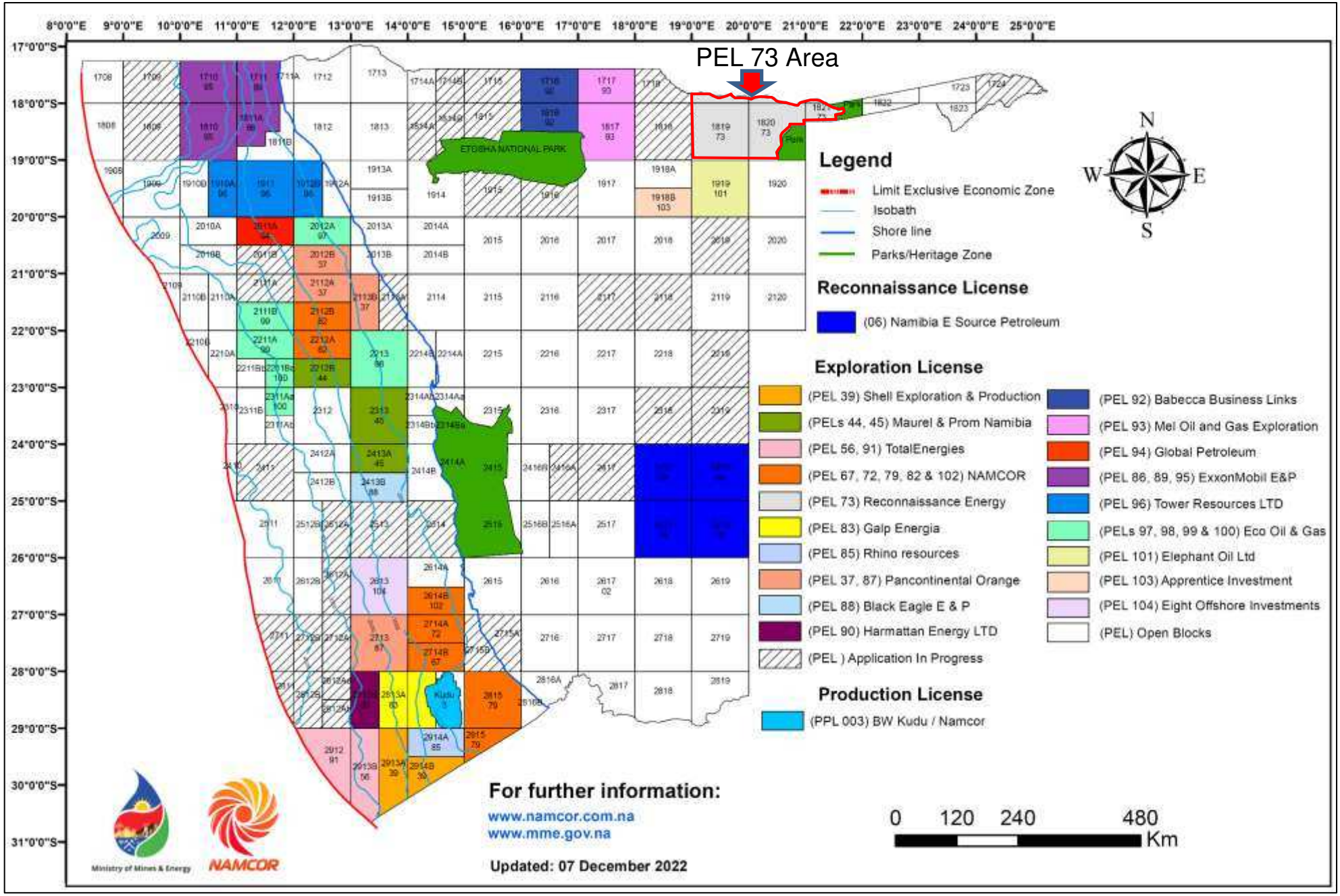

Figure 1.1: Hydrocarbon Map of Namibia showing Petroleum Exploration License (PEL) No. 73 covering the degree square Block No. 1819 and parts of Blocks 1719, 1720, 1721, 1820 and 1821 in Kavango Sedimentary Basin (KSB), Kavango West and East Regions, northern Namibia (Source: www.namcor.com).

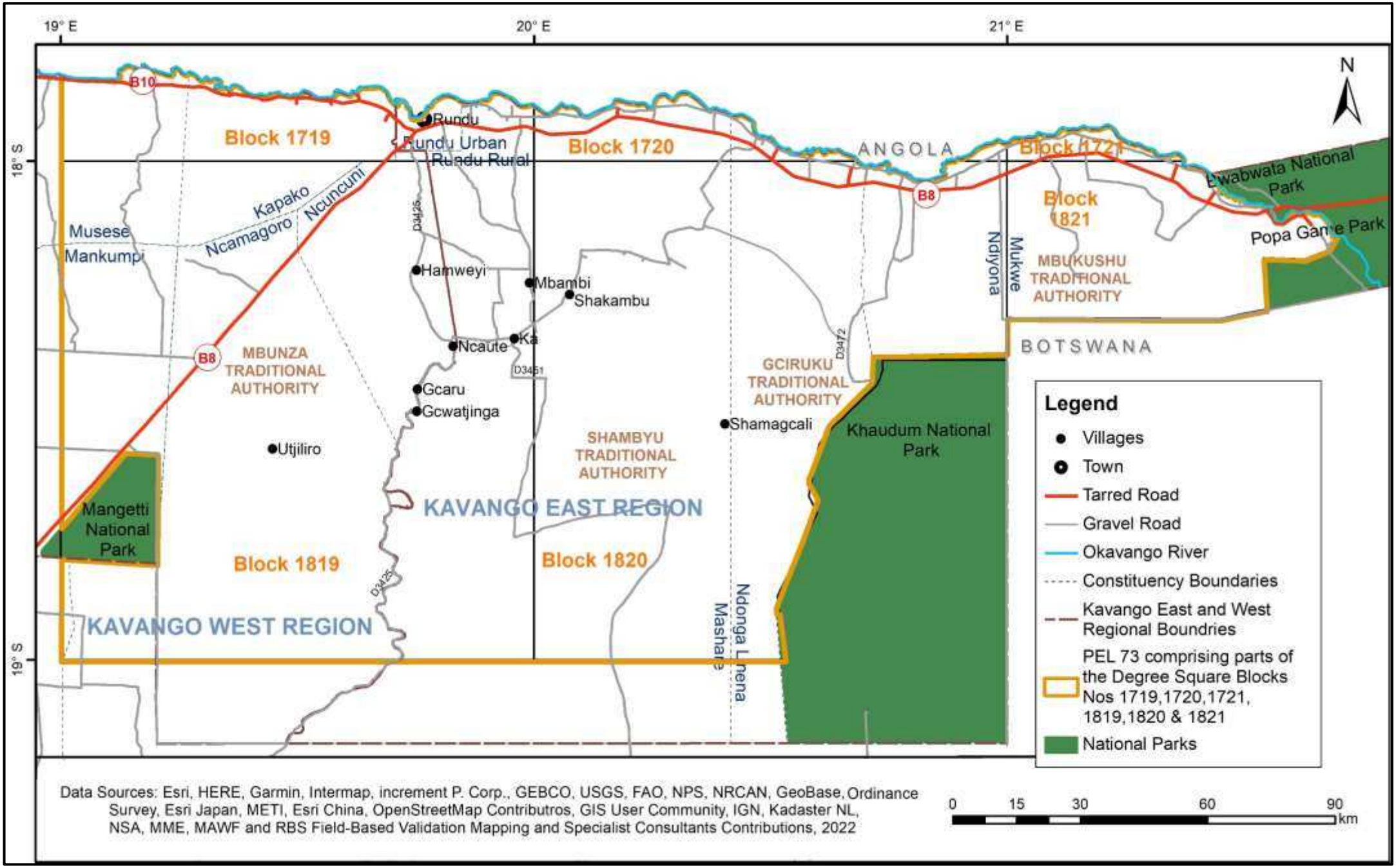

Figure 1.2: Regional location of PEL No. 73 covering the degree square Block No. 1819 and parts of Blocks 1719, 1720, 1721, 1820 and 1821 falling within the KSB covering multiple traditional authorities in Kavango East and West Regions.

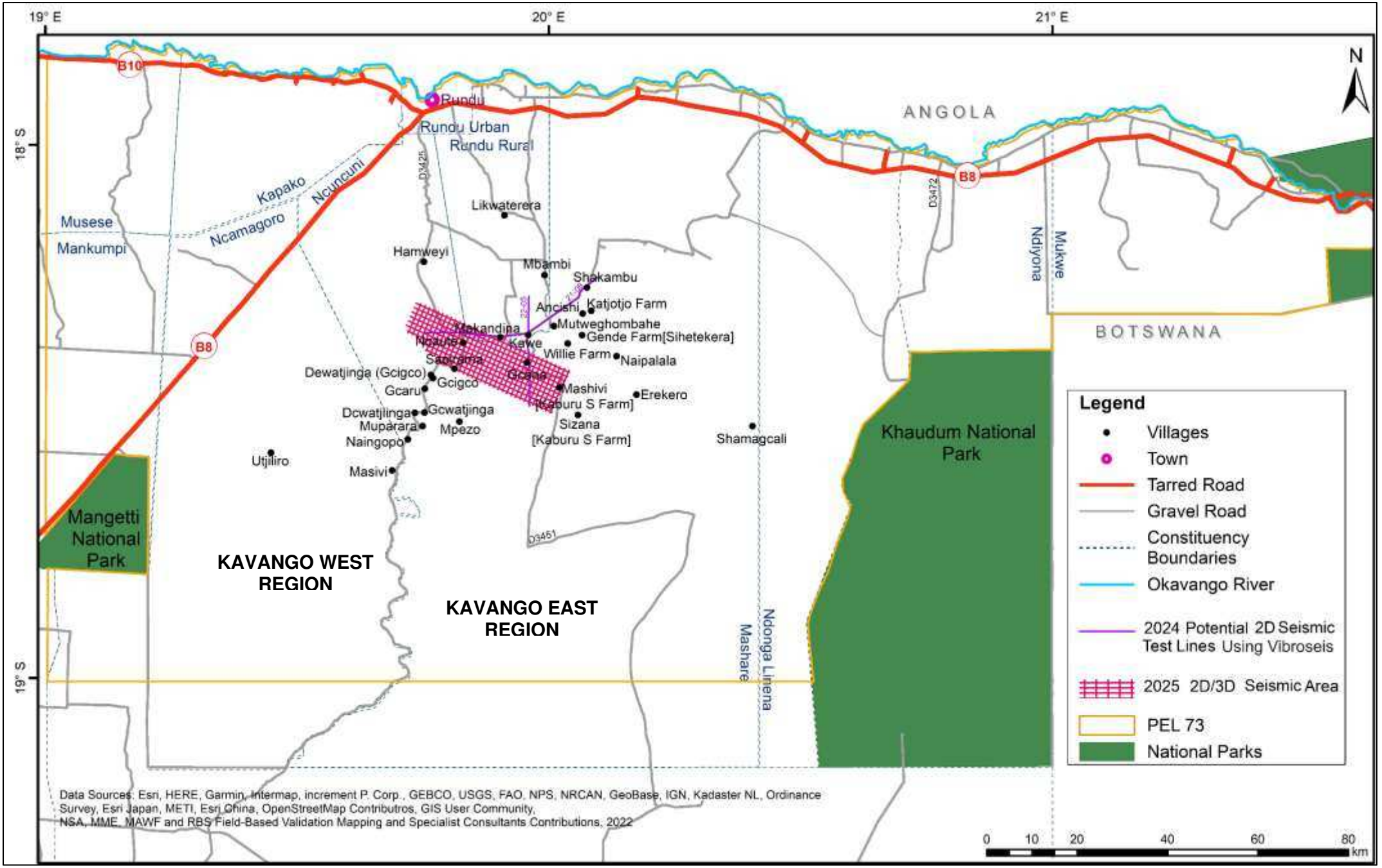

Figure 1.3: Regional location of the proposed 2024 and 2025 2D/3D seismic survey operational area in PEL No. 73 falling in Kavango East and West Regions.

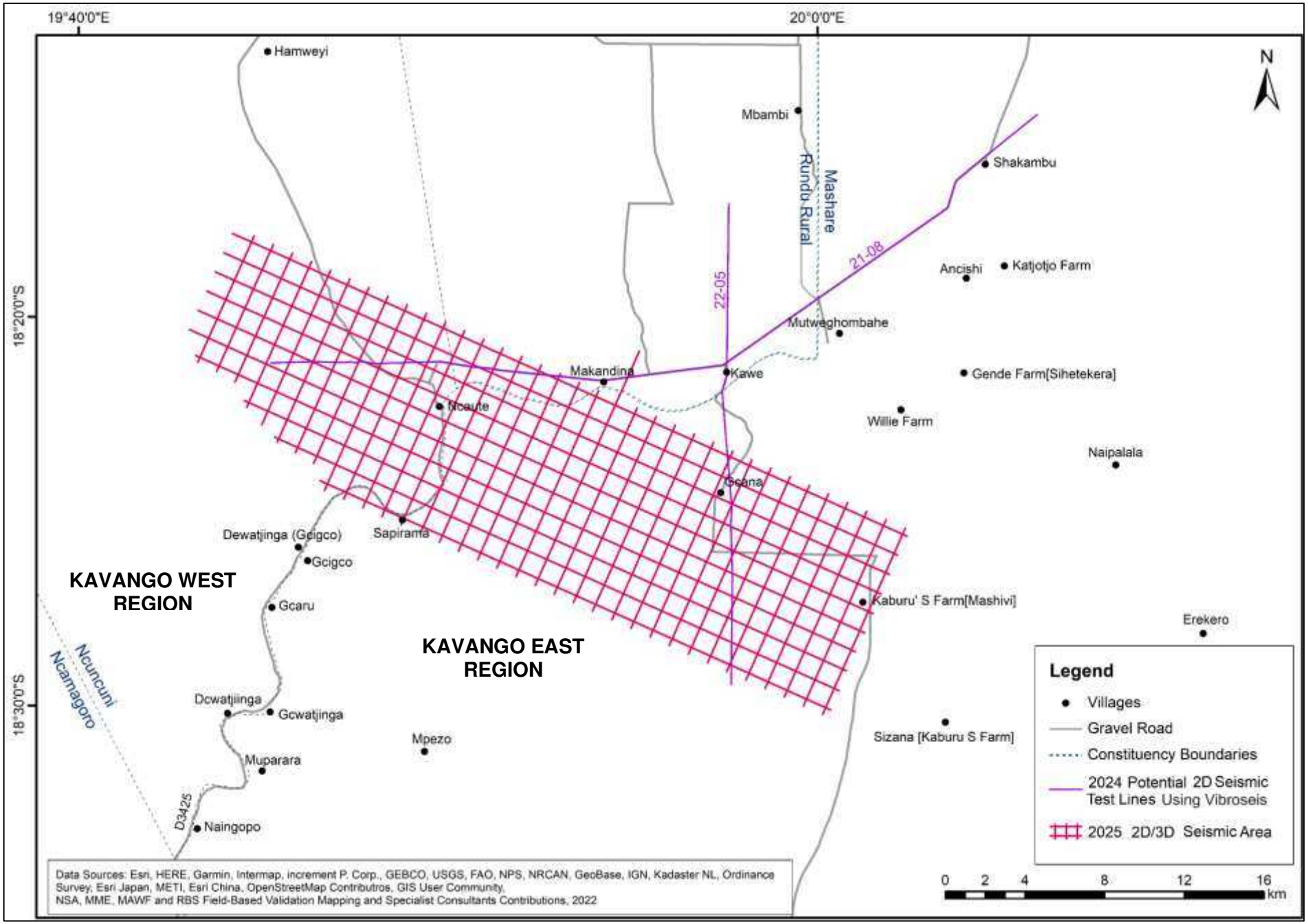

Figure 1.4: Detailed location of the proposed 2024 and 2025 2D/3D seismic survey operational area in PEL No. 73 falling in Kavango East and West Regions.

ECC – 01491 Serial: ZLbFN41491

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

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

TO

Reconnaissance Energy Namibia (Pty) Ltd
P. O. Box 2393, Windhoek

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

Proposed 2D Seismic Survey covering the Areas of Interest (AOI) in Petroleum Exploration License (PEL) No. 73, Kavango West and Kavango East Regions Respectively

Private Bag 13306
WINDHOEK NAMIBIA
02 JUL 2021

ENVIRONMENTAL COMMISSIONER

Issued on the date: 2021-07-02

Expires on this date: 2024-07-02

(See conditions printed over leaf)

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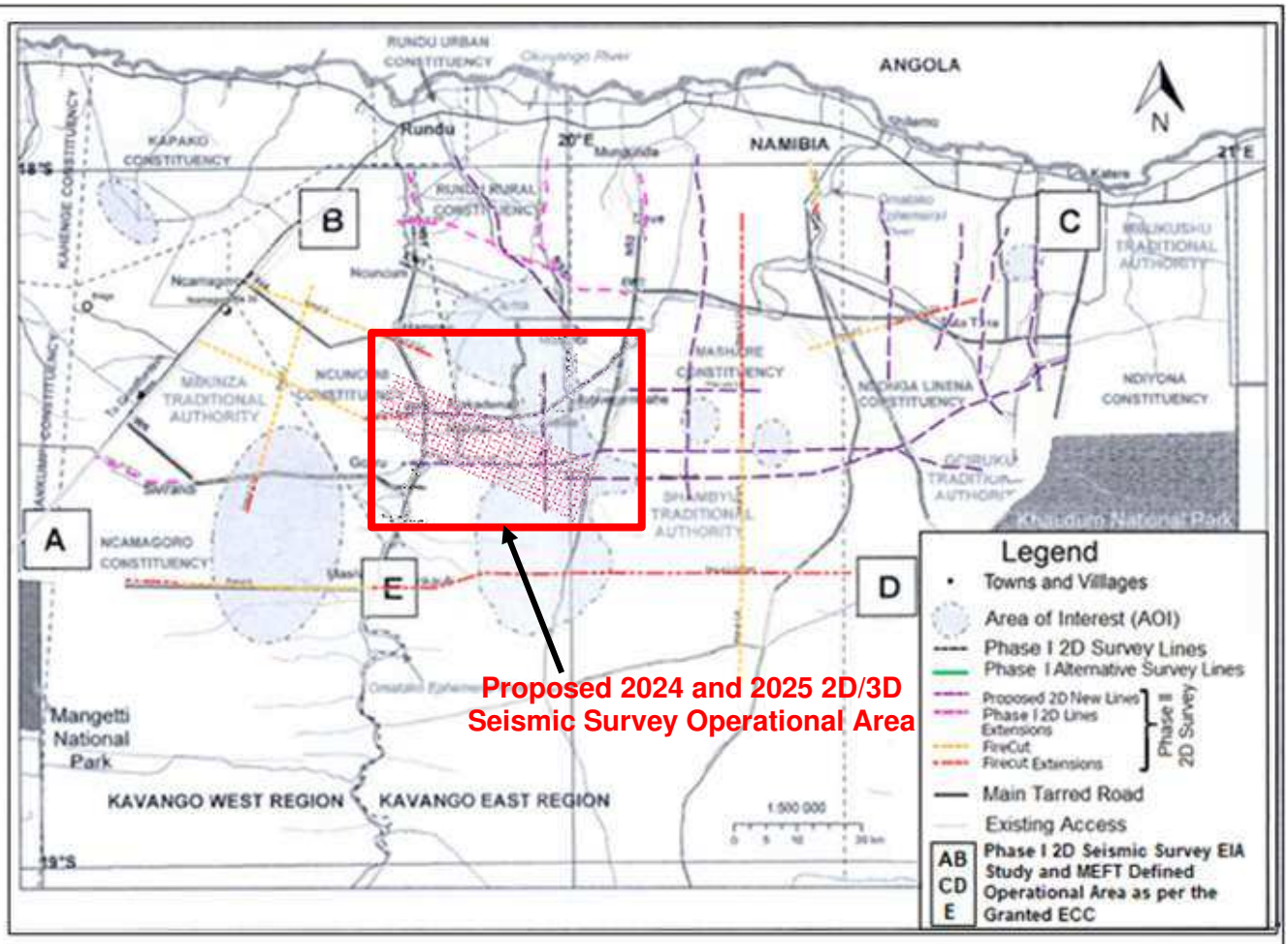
Figure 1.5: Copy of the Environmental Clearance Certificate (ECC) No. 01491 granted for seismic survey operations in PEL 73 on the 2nd July 2021 and expired on the 2nd July 2024 and need to be renewed and amended for the proposed 2024, 2025 and future 2D/3D seismic survey operations.



Points	Latitude	Longitude
A	-18.556648°	19.153989°
B	-18.041846°	19.645838°
C	-18.036479°	20.696806°
D	-18.623989°	20.470201°
E	-18.608937°	19.707811°

5

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

Figure 1.6: Detailed outline of the MEFT defined operational area **ABCDE** attached to the Environmental Clearance Certificate granted to REN for the seismic survey operations in PEL 73. The proposed 2024 and 2025 2D/3D seismic survey operational area falls within the MEFT defined operational area **ABCDE** and covers the same area already covered by the previous multiple seismic surveys Phases I, II, and III EIA studies and monitoring activities undertaken from 2021-2023 within this AOI in PEL 73.

1.3 Regulatory Provisions for the Proposed Seismic Survey Operations

As provided for in the Petroleum Agreement signed between REN and the Government of the Republic of Namibia represented by the Ministry of Mines and Energy (MME), REN has committed to undertaking petroleum exploration activities in PEL 73. Regulatory compliance studies have been undertaken for seismic survey operations and an Environmental Clearance Certificate (ECC) was granted by the Environmental Commissioner in the Ministry of Environment, Forestry, and Tourism (MEFT) on the 2nd July 2021 (Figs. 1.5 and 1.6).

A detailed outline of the MEFT defined operational restrictive area attached to the copy of the Environmental Clearance Certificate (ECC) granted for the initial seismic survey operations in PEL 73 is shown in Fig. 1.6. REN is proposing to undertake the 2024 and 2025 2D/3D seismic survey operations within the framework of the already granted ECC and in line with all the national regulatory provisions. The Petroleum Agreement states that if the Company or the operator for the Company has already completed and submitted to the Government reports on the studies referred to in Clause 11.8 for a previous Exploration Licence held in Namibia in the 5-year period preceding the application for the current Exploration Licence and those studies either:

(a) Are sufficiently broad ranging to encompass clearly the present Licence Area, or.

(b) Do not encompass the present Licence Area but a baseline study and environmental impact assessment study have been submitted by the holder of an Exploration Licence covering an area near the present Licence Area the Company may in a case falling within (a) above, submit the reports on the studies for such previous Licence in fulfilment of the requirements of clauses 11.7 and 11.8 relating to exploration drilling and, in a case falling within (b) above submit such environmental impact assessment submitted by the said holder of an Exploration Licence, with any modifications which the Company wishes to make provided that conditions as prescribed in the Petroleum Agreement are met.

In line with the provisions of the environmental obligations under Clause 11 of the Petroleum Agreement concluded under the Petroleum (Exploration and Production), 1991, (Act No. 2 of 1991) and Petroleum Laws Amendment Act, 1998, (Act 24 of 1998), the proposed 2024 and 2025 2D/3D seismic survey operations fall within the area already covered by previous multiple environmental assessment and field-based monitoring studies for multiple 2D seismic surveys that have been undertaken between 2021-2023 and falls within the MEFT defined and approved operational area **ABCDE** as shown in Fig. 1.6.

The proposed 2024 and 2025 2D/3D seismic survey operations will apply the same operational procedures and international best practices used for the previous 2D seismic survey operations that have been undertaken in the area and no operational diversions are expected. Operational lessons learned from the previous multiple 2D seismic survey operations undertaken in the same area will be applied to the proposed 2024 and 2025 2D/3D seismic survey operations and key mitigation measures will form part of the EMP Report to be implemented and monitored by the Proponent throughout the envisaged operational period.

Following on the review of the regulatory provisions, conditions of the Petroleum Agreement and requirements with the Competent Authority (MME) and Environmental regulator (MEFT) this EMP Report has been prepared to support the applications for the renewal and amendment and of the ECC No. 01491 with respect to the scope of the proposed 2024 and 2025 2D/3D seismic survey operations.

1.4 Summary of Onshore Petroleum Exploration Process

Petroleum exploration involves the implementation of multiple exploration steps over many years. The following is the summary of the key steps:

1. **Step 1**: An applicant develops a theoretical hydrocarbon model and apply for a PEL and once the license is granted there is no requirement for undertaking environmental assessment and obtaining the Environmental Clearance Certificate (ECC) over the entire license area. The

environmental assessment and all other applicable permits are only required once the PEL holder decides to implement field-based exploration activities such as drilling or seismic survey.

2. **Step 2**: Collection of the existing key historical data sets pertaining to petroleum geology, regional sedimentary basin frameworks, aerial gravity, magnetics and if the sedimentary basin is unknown, a site-specific stratigraphic well/s drilling operation is undertaken to confirm the existence of sedimentary basin / petroleum system as delineated from the analysis of the aerial geophysical data and other exiting geological data sets.

3. **Step 3:** Once the sedimentary basin and petroleum system have been confirmed and potential target area (Area of Interest-AOI), defined, geophysical survey methods such as airborne gravity, 2D or 3D seismic surveys are used in the search for potential geological structures that could hold economic oil or gas called reservoirs. An ECC is required for this step, and an ECC No. 01491 was granted by the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT) on the 2nd July 2021 and expired on the 2nd July 2024 (Fig. 1.5 and 1.6). This Environmental Impact Assessment (EIA) has been prepared to support the application for the renewal and amendment of the ECC No. 01491 with respect to the proposed 2024 and 2025 2D/3D seismic survey operations (Fig. 1.5). The proposed 2024 and 2025 2D/3D seismic survey operational area falls within the same area already covered by the previous multiple seismic survey EIA studies and monitoring activities undertaken from 2021-2023 and the MEFT defined operational area **ABCDE** attached to the ECC No. 01491 granted to REN for the seismic survey operations in PEL 73 (Fig. 1.6), and.

4. **Step 4**: Exploration and appraisal drilling operations well drilling is undertaken on the identified geological structure (potential reservoir) based on the interpreted results of the seismic survey. The objective is to test and confirm if the seismic survey delineated geological structure/s contains oil or gas. If the drilled exploration well is dry, it is usually capped and abandoned safely. If commercial oil or gas is discovered during the exploration well drilling operations, then an appraisal programme may be undertaken to test the size, economics of the discovered oil or gas and define the extent of the potential production field. An ECC is required for the exploration and appraisal drilling operations and an ECC No. 2300571 was granted by the Environmental Commissioner in the MEFT on the 4th July 2023 and will expire on the 4th July 2026.

According to REN, 2022, the results of the 6-1 Mbambi, and 6-2 Kawe, 8-2 Makandina stratigraphic test wells drilled by REN in 2021 and 2022 respectively, and the subsequent 2D seismic survey data acquired over the Kavango Sedimentary Basin (KSB), have established a significant rift basin similar to other major petroleum provinces / rift basins in other parts of World (Figs 1.7-1.10).

The integrated interpretation has established the following three groups of hydrocarbon opportunities ("Plays") (Figs. 1.7-1.10):

(i) Primary: Karoo Rift Fill (Light Oil).

(ii) Secondary: Intra-Rift Fault Blocks (Light Oil), and.

(iii) Secondary: Damara Fold Belt (NEW PLAY, Gas/Gas Condensate).

A new petroleum system ("Play") for KSB, the Damara Fold Belt, has been established based on the interpretation of the seismic data acquired since 2021. The Damara Fold Belt play situated to south of the licenses area was not anticipated in the original studies of the KSB.

The Karoo Rift Fill (Light Oil), Secondary: Intra-Rift Fault Blocks (Light Oil), and Secondary: Damara Fold Belt have become a key strategic priority and primary focal areas of exploration efforts that requires the acquisition of highly localised and focused additional 2D and 3D seismic survey lines compared to the previous regional studies and using not only the Explorer 860 Accelerated Weight Drop (AWD) as the energy source, but also explore the opportunities of using the Vibroseis trucks such as the Nomad 65 Vibrator.

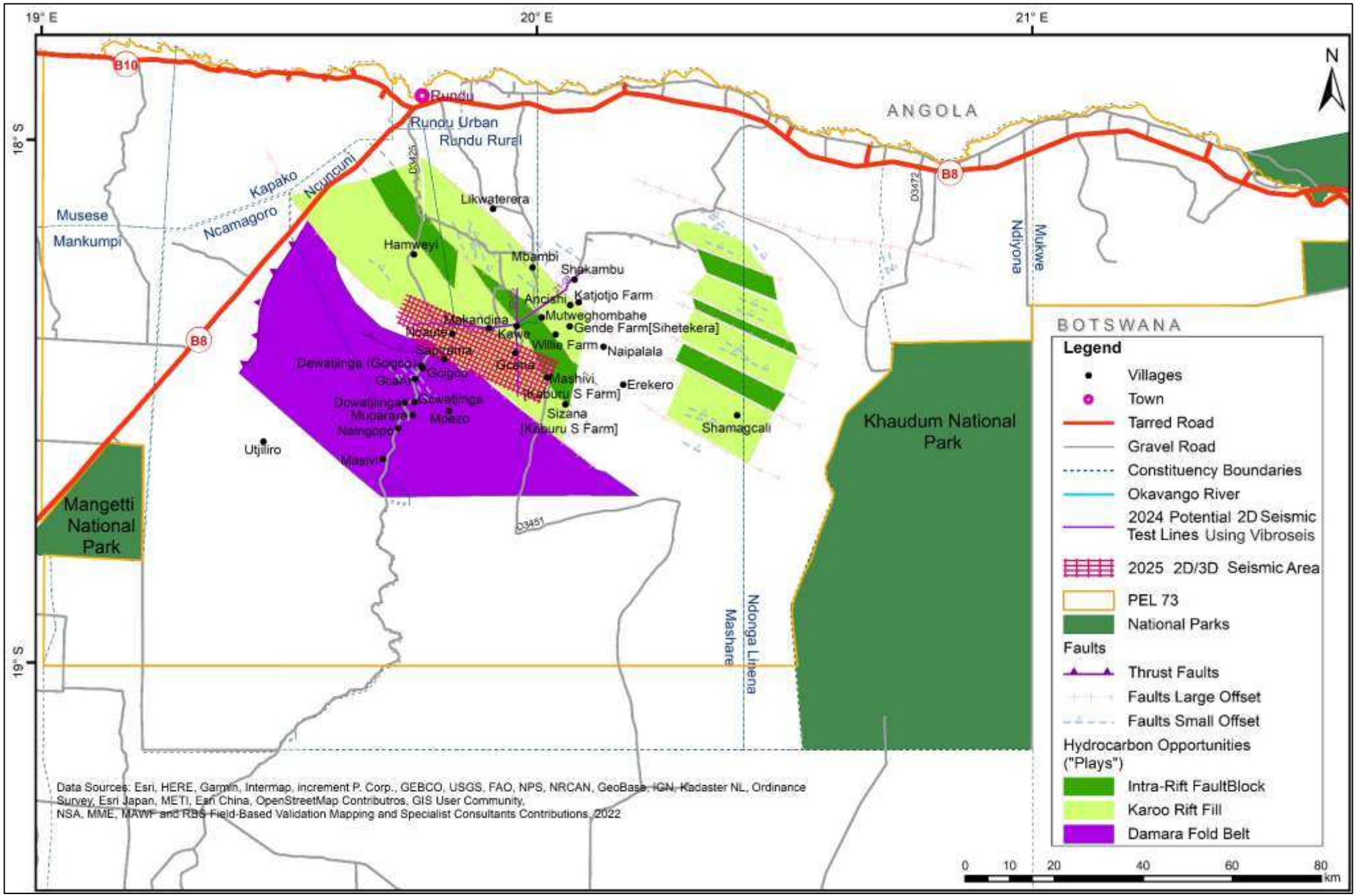


Figure 1.7: Regional location of the proposed 2024 and 2025 2D/3D seismic survey AOI with respect to the delineated Karoo Rift Fill (Light Oil), Intra-Rift Fault Blocks (Light Oil), and Damara Fold Belt (NEW PLAY, Gas/Gas Condensate) hydrocarbon plays in PEL 73.

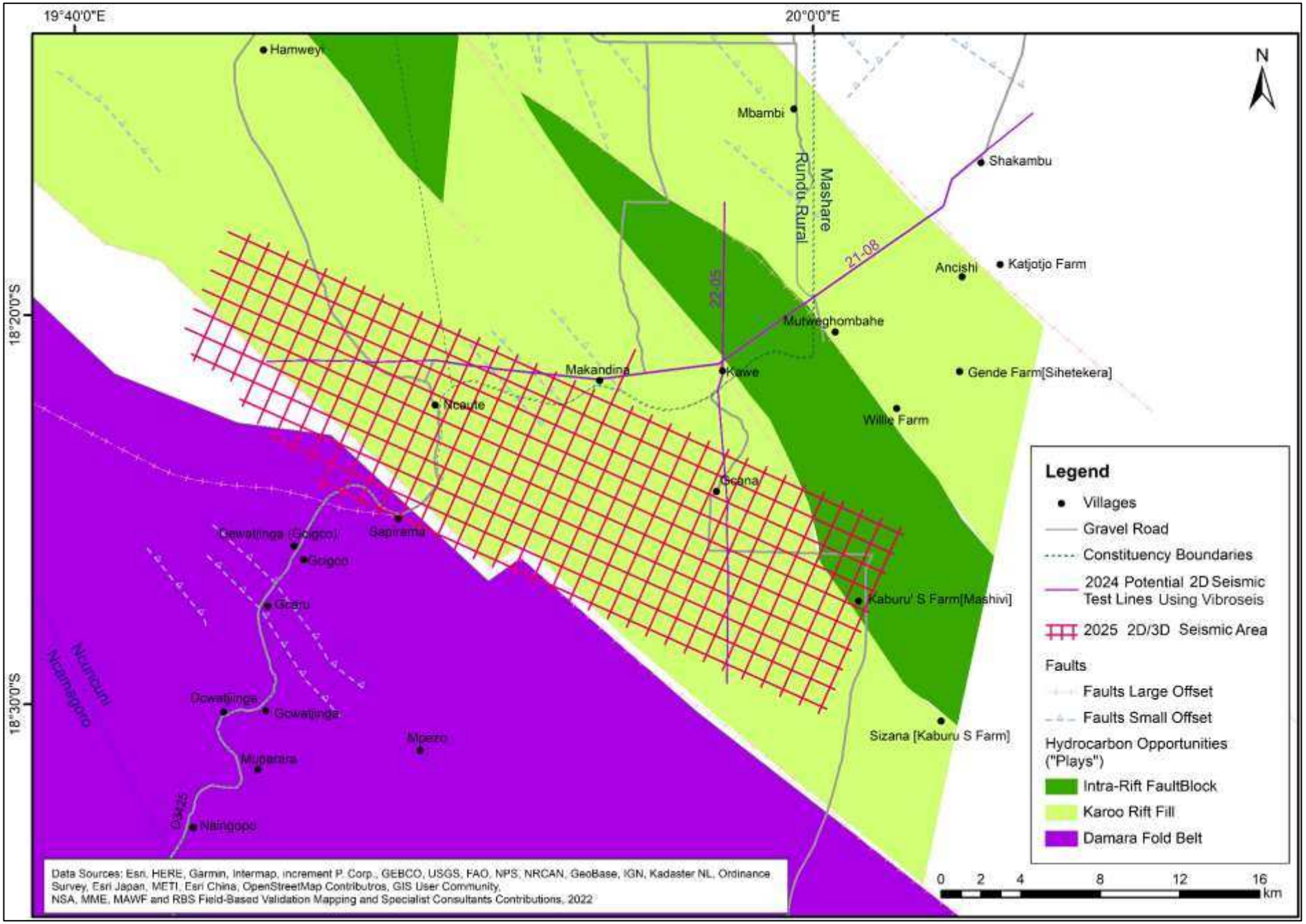
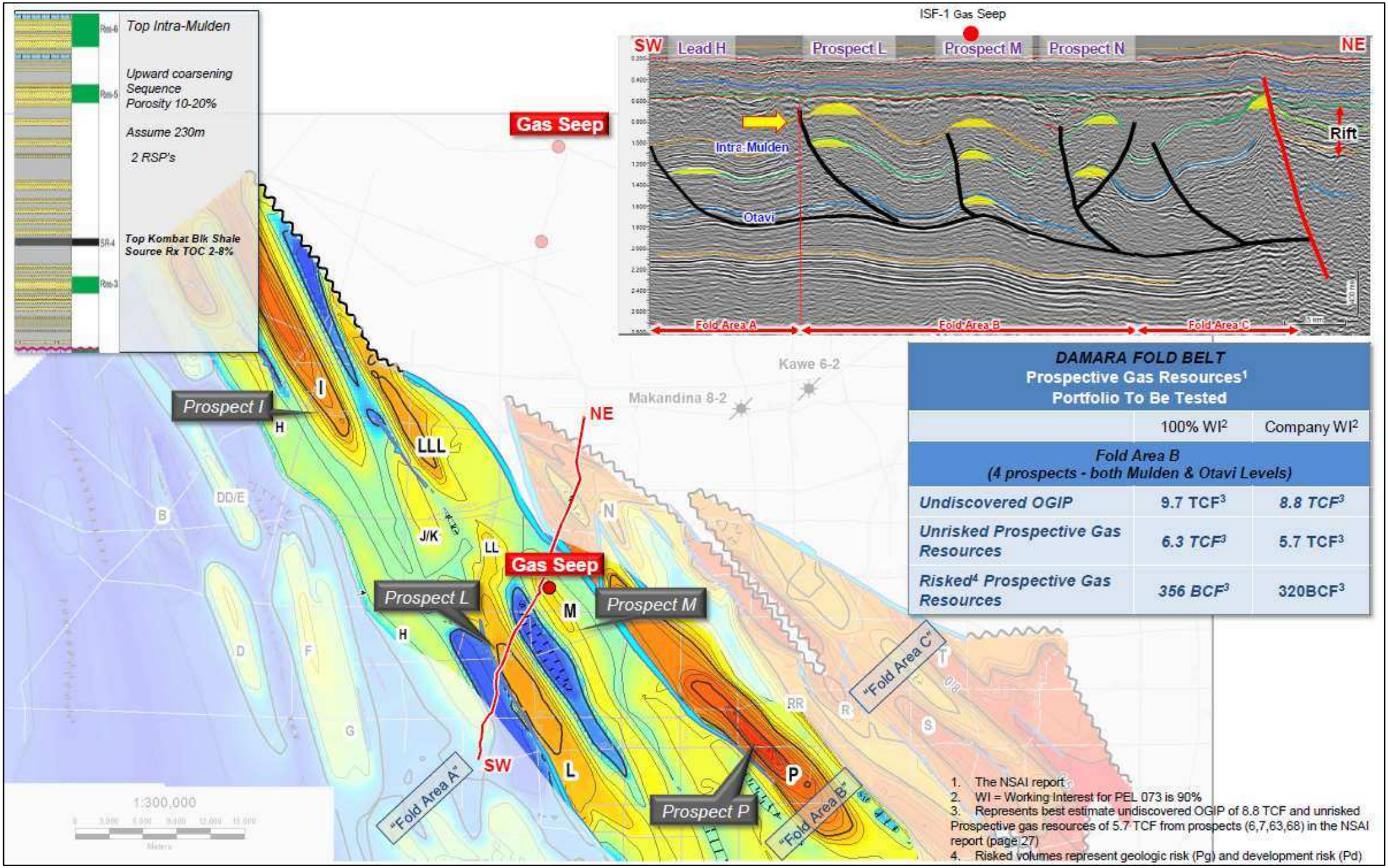


Figure 1.8: Detailed location of the proposed 2024 and 2025 2D/3D seismic survey AOI with respect to the delineated Karoo Rift Fill (Light Oil), Intra-Rift Fault Blocks (Light Oil), and Damara Fold Belt (NEW PLAY, Gas/Gas Condensate) hydrocarbon plays in PEL 73.

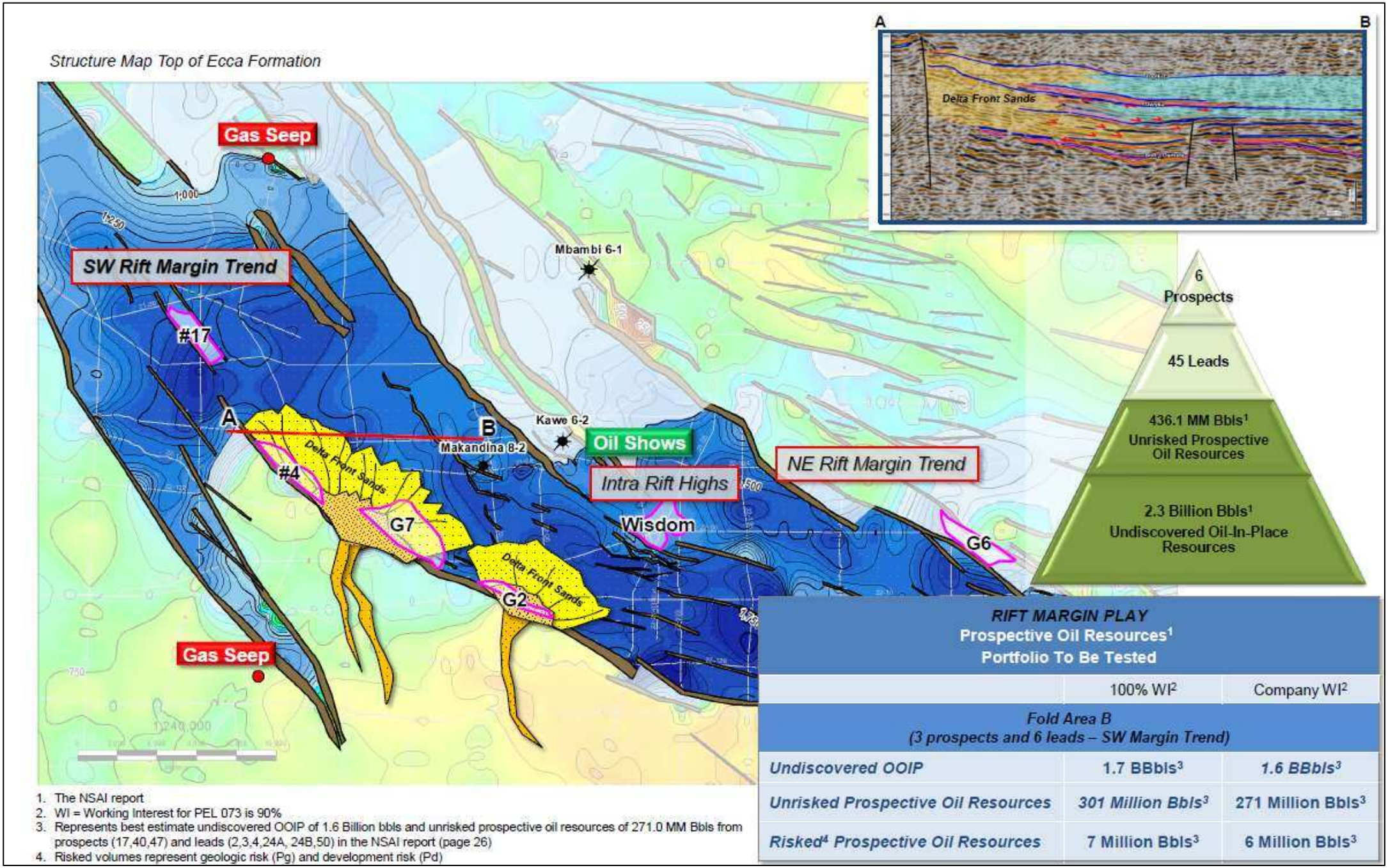


DAMARA FOLD BELT
Prospective Gas Resources[1]
Portfolio To Be Tested

	100% WI[2]	Company WI[2]
Fold Area B (4 prospects - both Mulden & Otavi Levels)		
Undiscovered OGIP	*9.7 TCF[3]*	*8.8 TCF[3]*
Unrisked Prospective Gas Resources	*6.3 TCF[3]*	*5.7 TCF[3]*
Risked[4] Prospective Gas Resources	*356 BCF[3]*	*320BCF[3]*

1. The NSAI report
2. WI = Working Interest for PEL 073 is 90%
3. Represents best estimate undiscovered OGIP of 8.8 TCF and unrisked Prospective gas resources of 5.7 TCF from prospects (6,7,63,68) in the NSAI report (page 27)
4. Risked volumes represent geologic risk (Pg) and development risk (Pd)

Figure 1.9: REN interpretation Pre-Karoo, Top Mulden Time Structure Map (Source: REN, 2024).



RIFT MARGIN PLAY Prospective Oil Resources[1] Portfolio To Be Tested		
	100% WI[2]	Company WI[2]
Fold Area B *(3 prospects and 6 leads – SW Margin Trend)*		
Undiscovered OOIP	1.7 BBbls[3]	*1.6 BBbls[3]*
Unrisked Prospective Oil Resources	*301 Million Bbls[3]*	271 Million Bbls[3]
Risked[4] Prospective Oil Resources	7 Million Bbls[3]	6 Million Bbls[3]

1. The NSAI report
2. WI = Working Interest for PEL 073 is 90%
3. Represents best estimate undiscovered OOIP of 1.6 Billion bbls and unrisked prospective oil resources of 271.0 MM Bbls from prospects (17,40,47) and leads (2,3,4,24A, 24B,50) in the NSAI report (page 26)
4. Risked volumes represent geologic risk (Pg) and development risk (Pd)

Figure 1.10: REN interpretation of the Primary Karoo Rift Play of the Kavango Sedimentary Basin (Data Source: REN, 2024).

1.5 Location of the Proposed Project

1.5.1 Regional Settings

PEL 73 and the proposed 2024 and 2025 2D/3D seismic survey area covers parts of both the Kavango West and East Regions in northern Namibia (Figs. 1.1-1.4). The key Areas of Interest (AOI) (potential sedimentary basin areas) within PEL 73 fall within Kavango-Zambezi Trans frontier Conservation Area (KAZA TFCA) (Fig. 1.11).

KAZA TFCA is a multiple land use international transboundary conservation initiative with a common vision of promoting and supporting sustainable livelihoods through coexistence and utilisation of multiple resource and resources areas for the greater benefits of the local communities of the member states (www.met.gov.na). KAZA TFCA is a transboundary initiative covering portions of Angola, Botswana, Namibia, Zambia, and Zimbabwe (Fig. 1.11).

The key multiple surface resources use areas found within KAZA TFCA includes: National parks, game reserves, forest reserves, conservancies, game/wildlife management areas, communal lands, but also subsurface resources such as water, minerals, geothermal energy, and petroleum that have not been acknowledged in the vision. Key targeted beneficiaries of the KAZA TFCA initiative are the local people especially the rural communities living around these resources and whose livelihoods are dependent on seasonal subsistence agriculture, animal husbandry, fishing, natural resource harvesting, tourism, trading, and hunting.

In Namibia and in other KAZA TFCA member states, the exploration and utilisation of potential subsurface resources under KAZA TFCA, are allowed, except in the formally national member state proclaimed sensitive areas such as national parks.

Sensitive areas within the Namibian portion of KAZA TFCA are known and the Areas of Interest (AOI) and the proposed 2024 and 2025 2D/3D seismic survey operations in PEL 73 have no negative environmental consequence on the sensitive land use of KAZA TFCA because the operations fall outside formally proclaimed sensitive national parks. The survey areas cover the communal land and the proposed 2024 and 2025 2D/3D seismic survey lines will not extend in national parks boundaries.

The overall KAZA TFCA vision is a work in progress because the assumed beneficiaries who are the local communities continue to languish in poverty on the doorsteps of KAZA, as seen around the current areas of operations covered by the completed Phase I, II, and III 2D seismic survey and the proposed 2024 and 2025 2D/3D seismic survey areas and in many parts of the Kavango East and West and Zambezi Regions that are supposed to be thriving within the boundary of KAZA TFCA.

Based on the field-based assessments conducted as parts of the various multiple EIA studies around the project area, the tourism benefits in the name of KAZA TFCA are in the hands of international, regional, and national connected operators, NGOs, and non-indigenous selected individuals. It remains to be seen when such benefits will start making some positive socioeconomic impacts on the lives and livelihoods of most of the rural communities who were supposed to benefit from such tourism resources and if this will even ever happen.

The proposed 2024 and 2025 2D/3D seismic survey area is not situated in the active catchment areas of the Okavango River but in fossilised channels of the Omatako–Omuramba Ephemeral River networks. According to Oldeland et. al., (2013), the Omatako Ephemeral River has not contributed to runoff from the Okavango for over 50 years. The active catchment areas of the Okavango River are situated in the Angolan Highlands as shown in Fig. 1.12.

The Kavango Sedimentary Basin and all the delineated sub basins fall within the Kavango West and East Regions communal land and not on the banks of the Okavango River, not related to the Okavango Delta, do not cover the archaeological sites and Tsodilo Hill which is in Botswana and do not fall in the legally proclaimed national parks within the Republic of Namibia (Fig. 1.13).

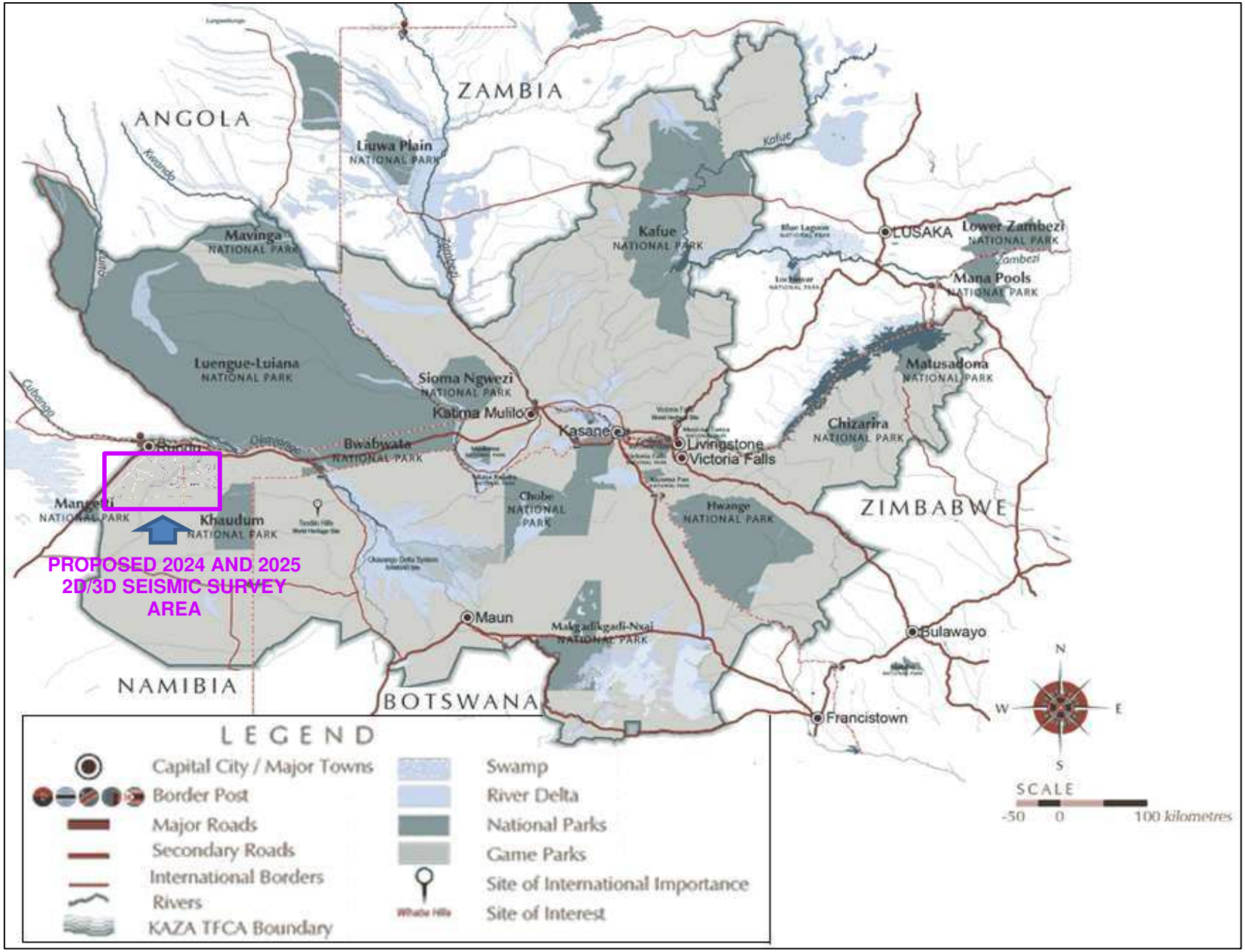


Figure 1.11: The Transboundary Kavango-Zambezi Transfrontier Conservation Area (KAZA TFCA) initiative and location of the survey area with respect to the excluded from petroleum exploration all formally proclaimed national park areas (www.kavangozambezi.org/en/).

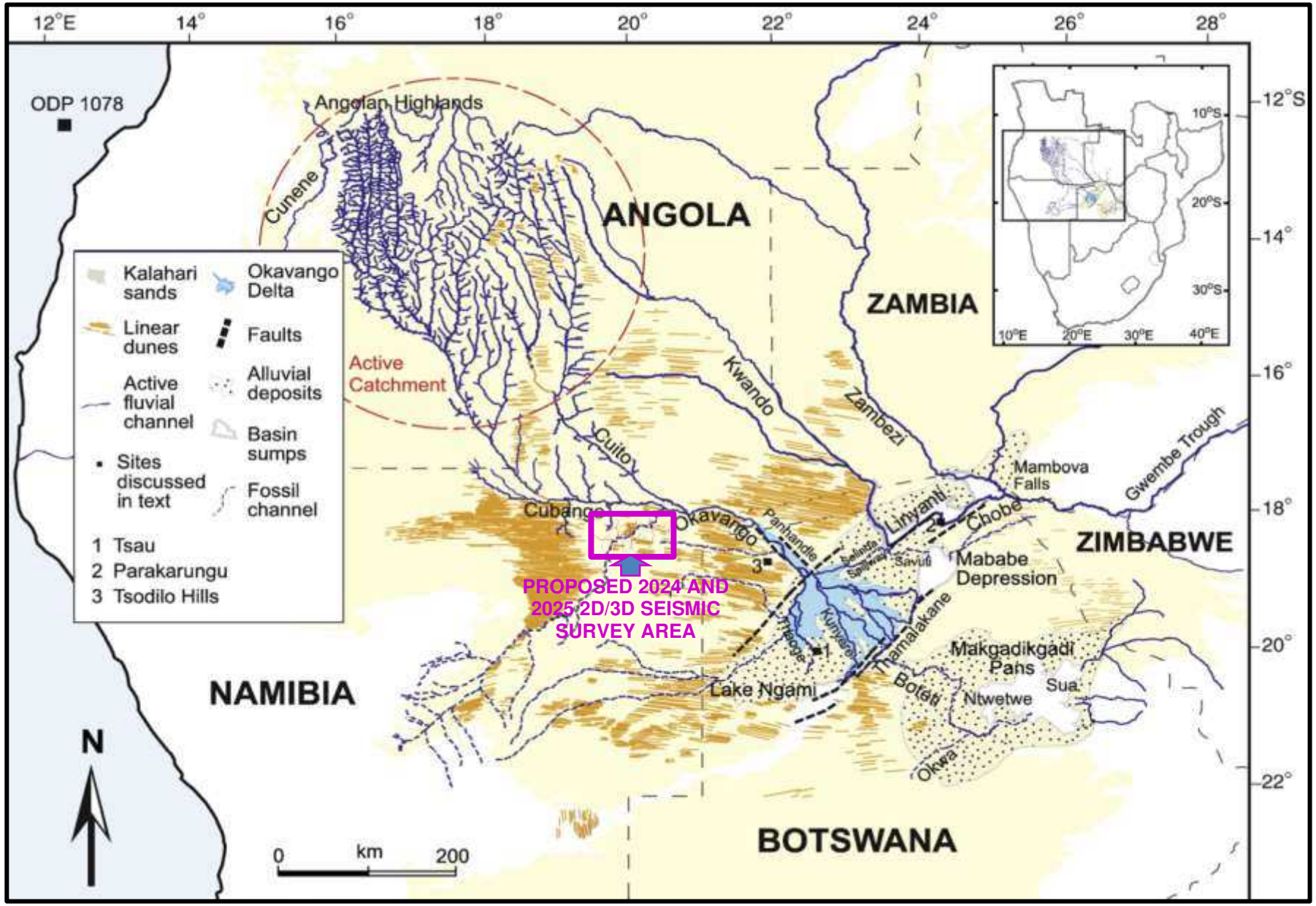


Figure 1.12: Regional map of the Middle Kalahari and the hydrological systems of the Okavango, Kwando, and Zambezi catchments in relation to the sump basins (Lake Ngami, the Mababe Depression and the Makgadikgadi pans). The proposed 2024 and 2025 2D/3D seismic survey area is not situated in the active catchment areas but in fossilised channels of the Omatako–Omuramba Ephemeral River networks. According to Oldeland *et. al.*, (2013), the Omatako Ephemeral River has not contributed to runoff from the Okavango for over 50 years.

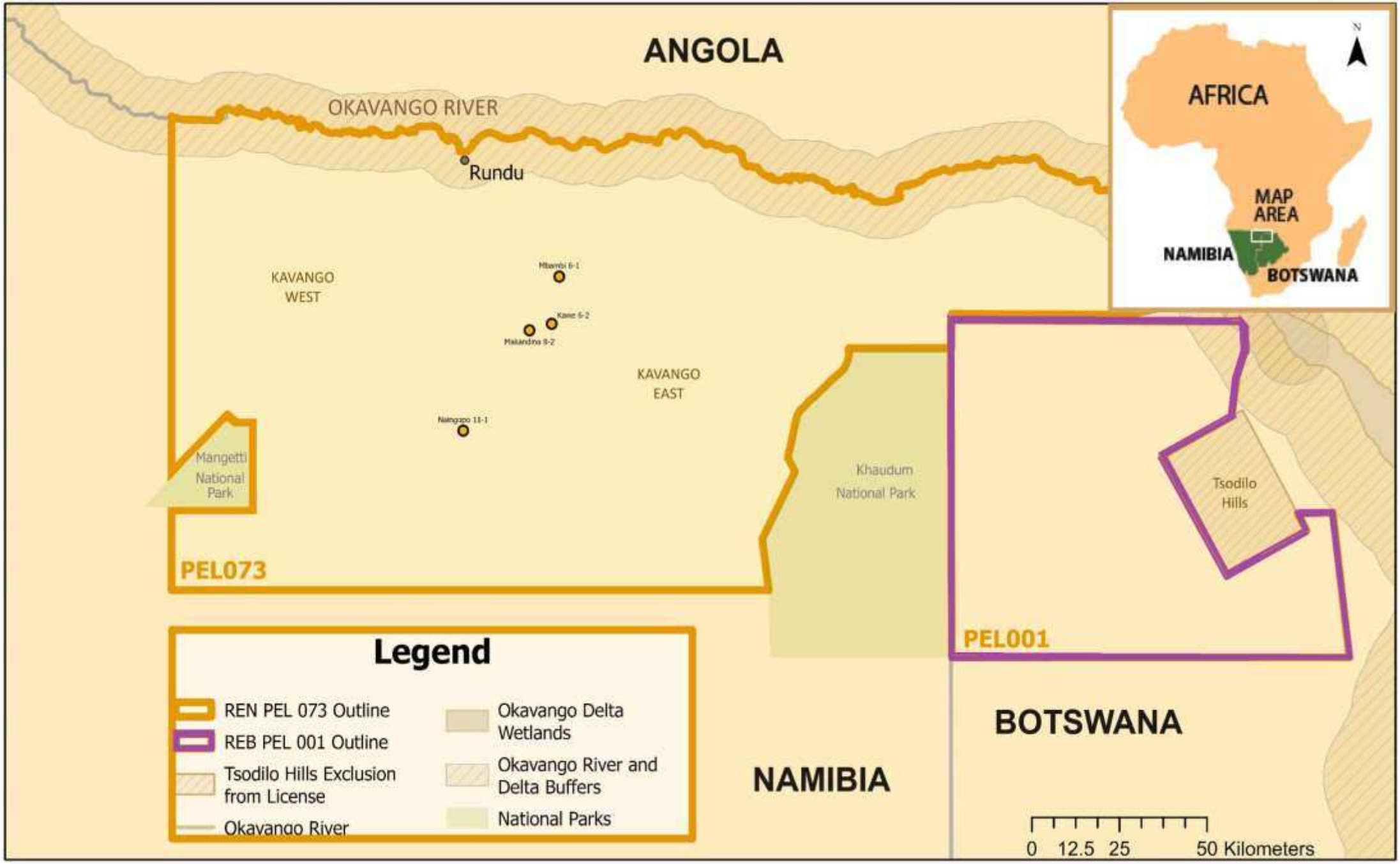


Figure 1.13: REN exploration license in Namibia with respect to key sensitive areas and neighbouring Botswana (Source: https://reconafrica.com).

1.5.2 Detailed Location of the Proposed 2024 and 2025 2D/3D Seismic Survey Areas

As part of the 2024 petroleum exploration operations for PEL 73, the Proponent intends to conduct 2D seismic surveys tests using the Vibroseis trucks along the test lines Nos. 21-08 and 22-05 (Fig. 1.14 and 1.15). The objective of the proposed 2024 2D seismic survey test is to compare the subsurface imaging results of the Explorer 860 and Vibroseis and selected the best 2D and 3D seismic survey equipment for potential surveys operations in PEL 73. The proposed 2024 Vibroseis trucks comparative test lines No. 21-08 and 22-05 (AOI) were previously surveyed using the Explorer 860 (Fig. 1.15). The proposed test lines No. 21-08 and 22-05 will be undertaken along existing D3447 Road and existing access tracks, respectively (Plates 1.1-1.5). The settlement of Kawe where lines 21-08 and 22-05 meet, is very congested (Fig. 1.16 and Plate 1.3). In the previous survey using the Explorer 860, larger line gaps sections were left along the profile due to structures, culverts, etc (Fig. 1.16). It is hoped that these gaps can be mitigated for the proposed Vibroseis survey operations by adopting the appropriated reduced-force sweeps and application of the minimum safety distances (Fig. 1.16 and Tables 1.1 and 1.2).

The proposed 2025 2D or 3D seismic survey area, which is subject to the positive outcomes of the current ongoing exploration operations and 2024 2D seismic survey tests results cover the local communal land around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564 (Figs. 1.15 and Plates 1.6-1.8). If 3D seismic survey is conducted, the operations will be highly localised with line spacing of up to 1 km. It will be very challenging to find existing accesses that can accommodate 1 km line spacing within the Gcwatjinga and Ncaute Community Forests (Plates 1.6-1.8). The creation of new accesses in the community forests shall be only be undertaken after obtaining consents from both the MEFT Regional Forestry Department and the relevant community forests management communities. The general area of the proposed 2024 and 2025 2D/3D seismic survey coverage falls in the sparsely populated but not pristine communal areas of the Ncuncuni Constituency of Kavango West Region, Rundu Rural and Mashare Constituencies of the East Regions. The general proposed survey areas fall within the boundaries of the Mbunza and Sambyu Traditional Authorities (Figs. 1.15 and 1.17 and Plates 1.6-1.8).

Table 1.1: Approved safe operating distances (Source: REN, 2024).

Vibrator Minimum Safety Distances (from Fleet Council of Governments (COG))		
Category	**Object**	**Distance (m)**
Residential	Houses, bridges, culverts, drains, water pipes	50
Sensitive	Water wells, graveyards, hand pumps	100

Table 1.2: Modified safe operating distances (Source: REN, 2024).

Variance to Vibrator Minimum Safety Distances (from Fleet Council of Governments (COG))			
Category	**Object**	**Distance (m)**	**Vibrator Variance**
Residential	Houses, bridges, culverts, drains, water pipes	30	Drive Levels at 40% with a single vibrator per fleet
Sensitive	Water wells, hand pumps	75	Drive Levels at 40% with a single vibrator per fleet

1.5.3 Project Accessibility

Access to the survey area can only be undertaken by 4x4 vehicles through the exiting gravel roads, sandy roads and tracks connecting small settlement (Fig. 1.15 and Plates 1.1-1.8). New cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT will need to be created around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access especially for the proposed possible 2025 2D/3D seismic survey operations (Plates 1.6-1.8). The local community, traditional authority, MEFT regional staff shall be responsible for defining the clearing specifications and shall provide field-based supervisory support to the clearing contractor. Once the firebreak cutlines have been cleared, REN shall use such newly created firebreak cutlines for acquisition of 2D/3D seismic data collection.

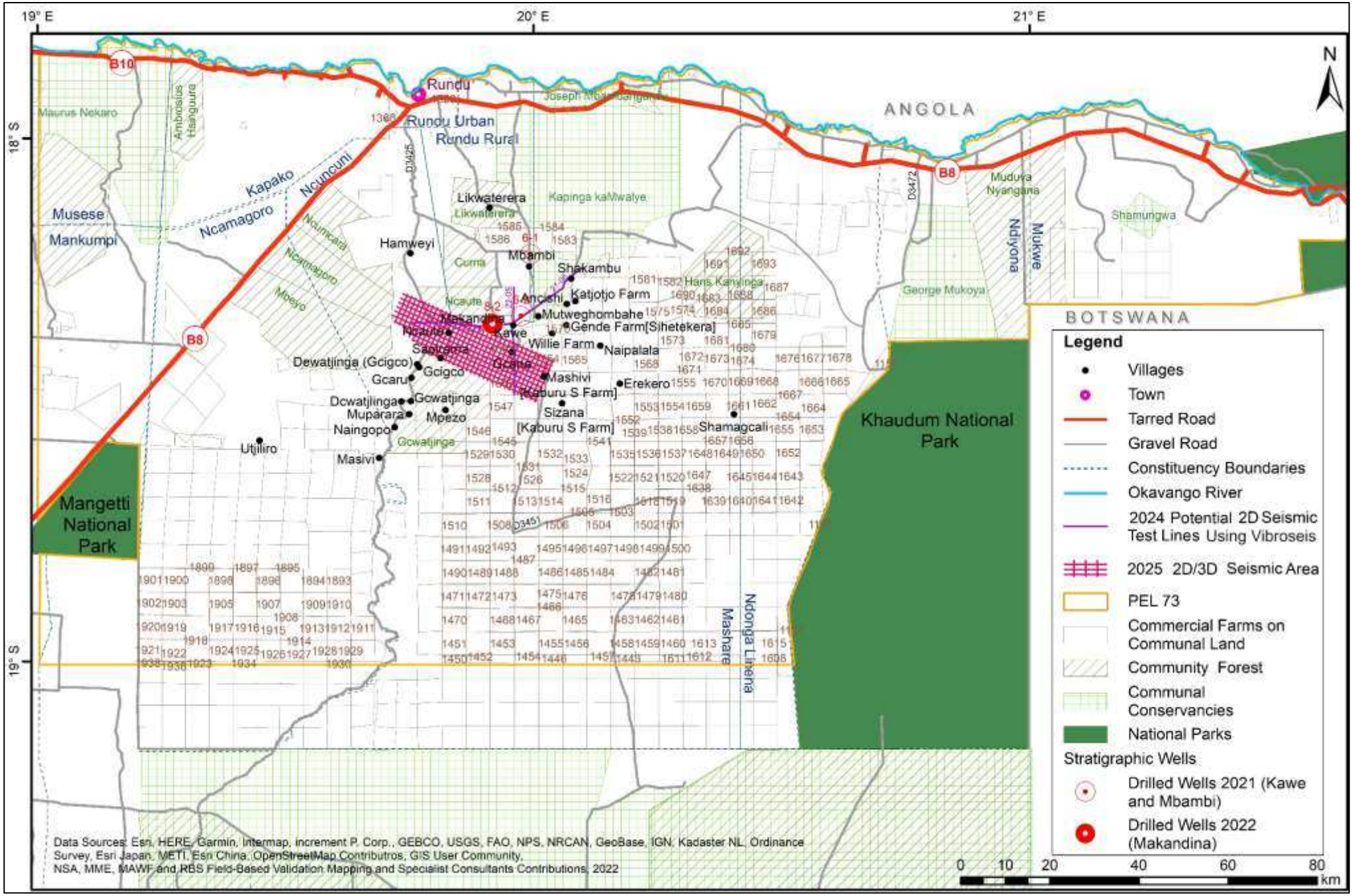


Figure 1.14: Regional location of the proposed 2024 and 2025 2D/3D seismic survey area, drilled stratigraphic wells, and other land uses such as commercial farms on communal land, community forest, community conservancies and national parks.

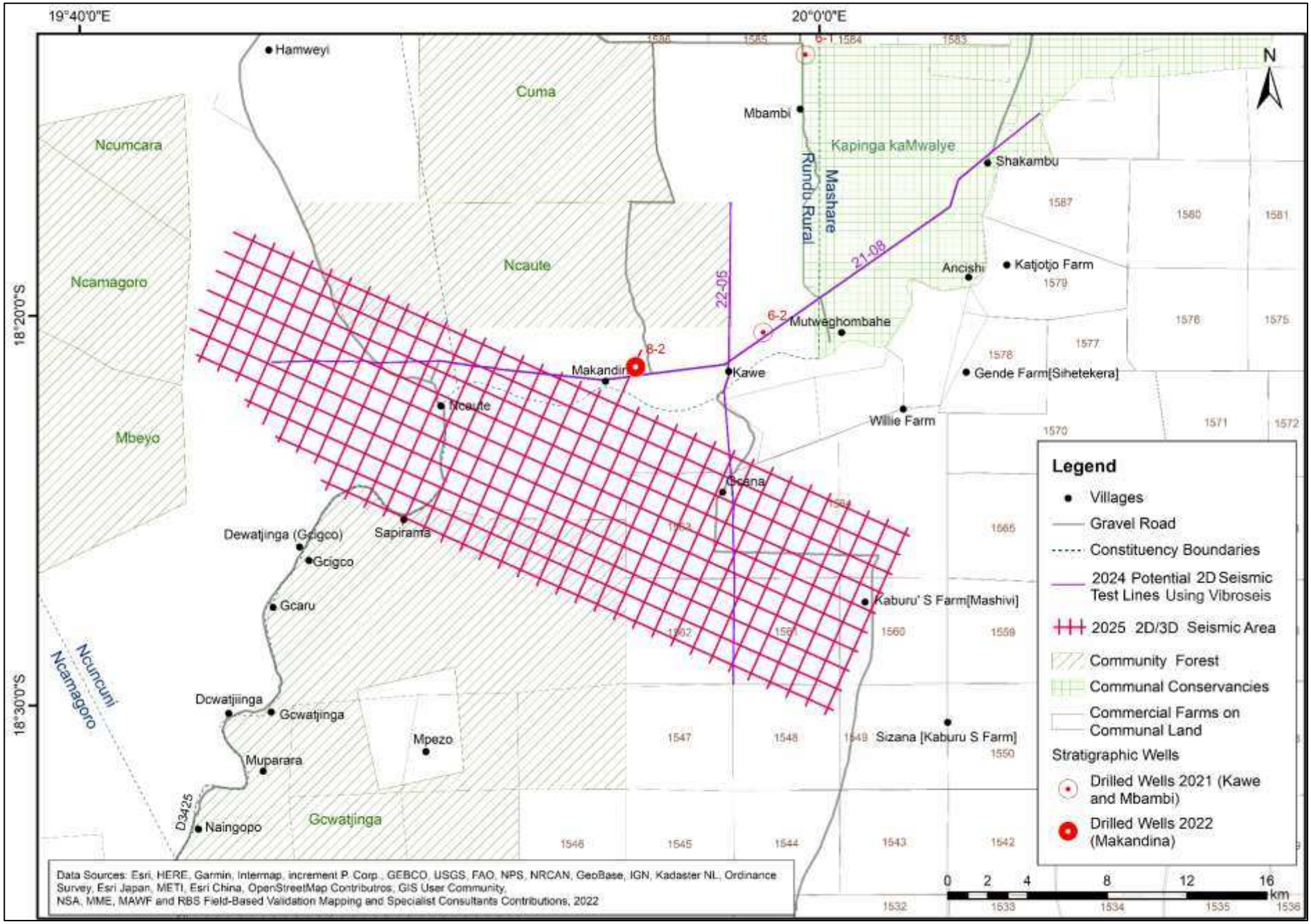


Figure 1.15: Detailed location of the proposed 2024 and 2025 2D/3D seismic survey area, drilled stratigraphic wells, and other land uses such as commercial farms on communal land, community forest, and community conservancies.

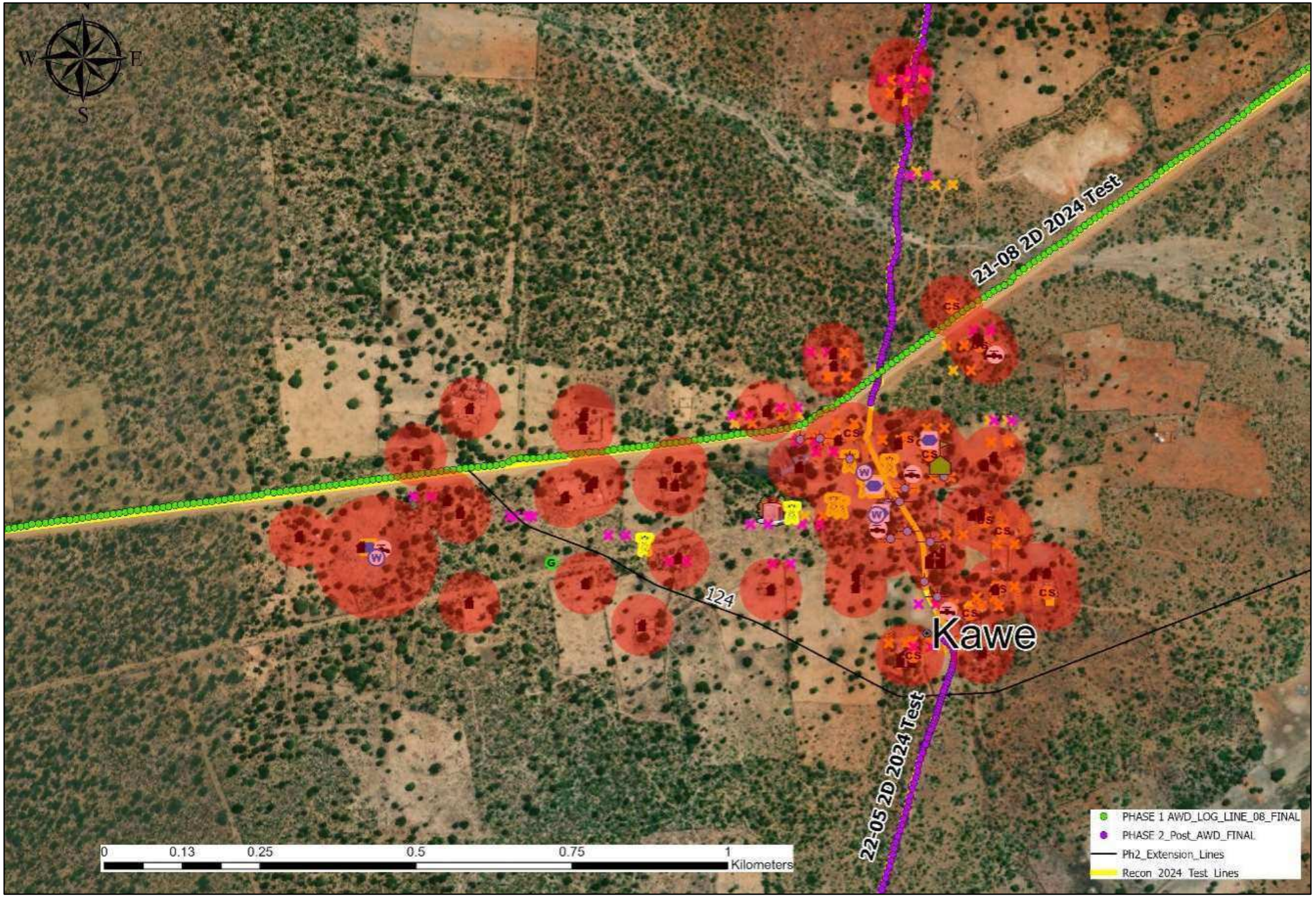


Figure 1.16: Congested area where lines 21-08 and 22-05 meet at Kawe and survey operation will need to be mitigated by adopting approperiated reduced-force sweeps and application of the minimum safety distances (Source: REN, 2024).

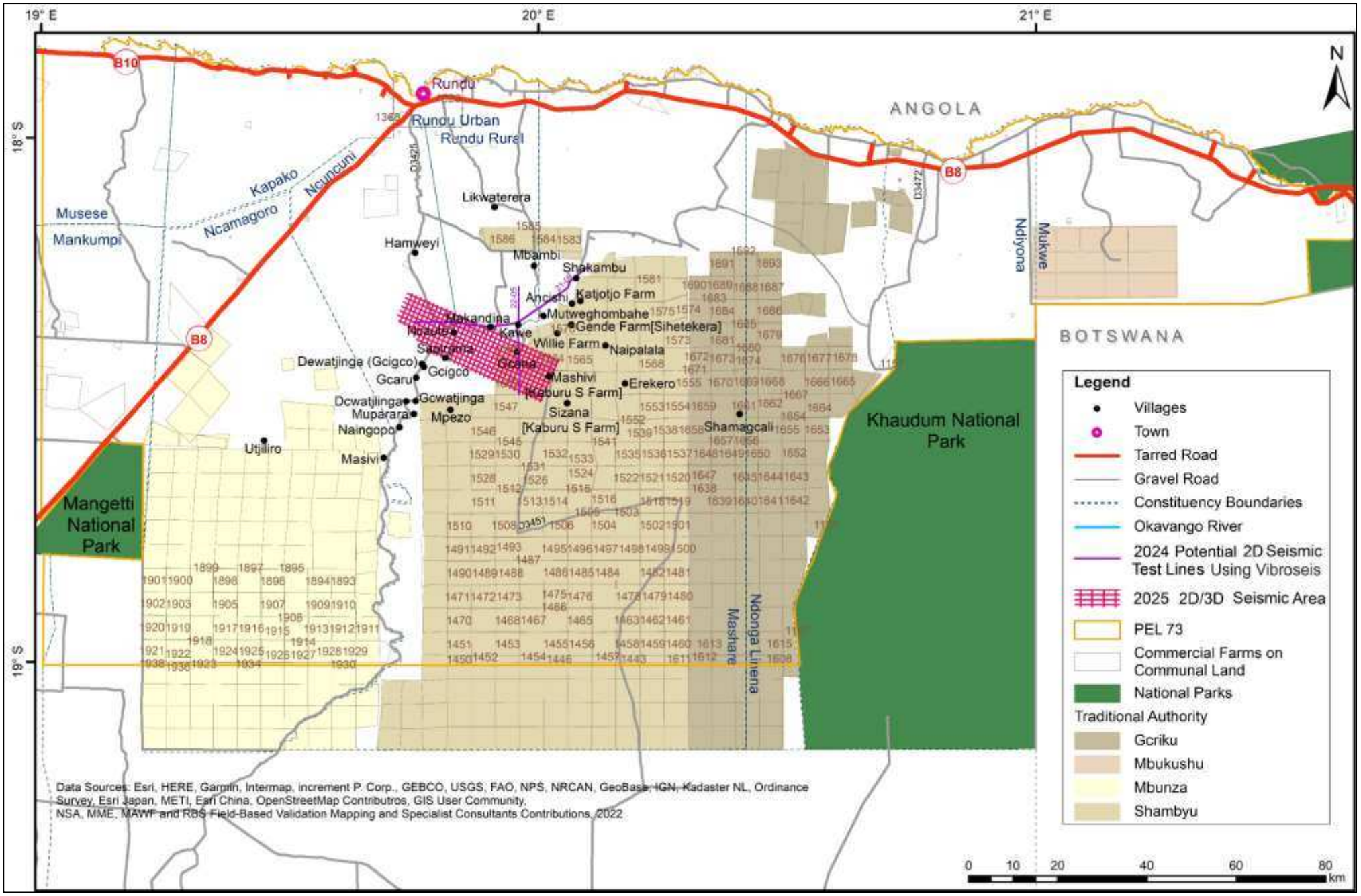


Figure 1.17: Location of the proposed 2024 and 2025 2D/3D seismic survey operational area, other land uses such as commercial farms on communal land, and traditional authority areas.

Plate 1.1: June 2024 drone image from Kawe to the east showing the proposed 2024 Vibroseis test line No. 21-08 (previous Explorer 860 surveyed line) to be undertaken along existing D3447 Road.

Plate 1.2: June 2024 drone image from Kawe to the west showing the proposed 2024 Vibroseis test line No. 21-08 (previous Explorer 860 surveyed line) to be undertaken along existing D3447 Road.

Plate 1.3: June 2024 drone image taken at Kawe where the proposed 2024 Vibroseis test lines 21-08 and 22-05 (previous Explorer 860 surveyed lines) meet. Although Kawe area is congested, the operations can be mitigated by adopting appropriated reduced-force sweeps and application of the appropriate minimum safety distances.

Plate 1.4: June 2024 drone image from Kawe to the east showing the proposed 2024 Vibroseis test line No. 22-05 (previous Explorer 860 surveyed line) to be undertaken along the existing access.

Plate 1.5: June 2024 drone image from Kawe to the south-southwest showing the proposed 2024 Vibroseis test line No. 22-05 (previous Explorer 860 surveyed line) to be undertaken along the existing access and across the Omatako Ephemeral River Channel.

Plate 1.6: June 2024 Drone images taken at Ncaute (**N**) showing the proposed 2025 2D/3D seismic survey **ABCD** quadrant views: (**A**) northwest view showing the Ncuate communal area, D3425 Road to Rundu, and the southern overlap portion of the Ncaute Community Forest, (**B**) northeastern view showing Ncaute communal land, Omatako Ephemeral River Channel and the eastern portions of the Ncaute Community Forest with no overlap with the survey area, (**C**) southwestern view showing the local communal land between old D3425 and the new district road to Gcaru, and (**D**) southeastern view showing the southern portions of the Gcwatjinga Community Forest and Commercial Farms on Communal Land in far background.

Plate 1.7: June 2024 Drone images taken at Makandina Village towards the southwest and showing the proposed 2025 2D/3D seismic survey potential area covering. New cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT will need to be created around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land with no existing access for the proposed possible 2025 2D/3D seismic survey operations.

Plate 1.8: June 2024 Drone images taken at Makandina Village towards the south and showing the proposed 2025 2D/3D seismic survey potential area covering Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564. New cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT will need to be created around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land with no existing access for the proposed possible 2025 2D/3D seismic survey operations.

2. THE BASIS FOR THE EMP FRAMEWORK

2.1 Likely Sources Impacts

The Environmental Assessment process undertaken for the proposed 2024 and 2025 2D/3D seismic survey operations has taken into consideration the sensitivity of the receiving environment (physical, biological, socioeconomic and ecosystem) with respect to proposed activities associated with each implementation stage / step.

The following is the summary of the likely sources of positive and negative impacts of the proposed 2024 and 2025 2D/3D seismic survey operations on the receiving environment that have been evaluated during the EIA process with mitigation measures provided in this EMP Report:

1. Planning and mobilisation (Pre-survey preparation, field scouting and mapping of buffers and offsets along proposed survey lines).

2. Base camp and fly-camps site setups and operations.

3. Widening of tracks by pruning vegetation overgrowth and tracks levelling as may be applicable.

4. Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access especially for the proposed possible 2025 2D/3D seismic survey operations.

5. Actual survey operation (data acquisition).

6. Demobilisation and closure (Survey Completion), and.

7. Any accidental event that may be associated with the routine and physical presence operational activities.

Although the proponent intends to conduct the 2024 and 2025 2D/3D seismic survey operations using Vibroseis trucks, this EMP Report and the applications for the renewal and amendment of the ECC No. 01491 for the overall seismic survey operation in PEL 73 shall provide for the use of both Vibroseis and Explorer 860. A comparative analysis of the Explorer 860 and Vibroseis truck are shown in Table 2.1 and Plates 2.1 and 2.2).

The Polaris Explorer 860 Unit works as a solar seismic sources vehicle and is not combined with additional Explorer 860 units. The Nomad 65 Vibrators can be combined in fleets from 1 unit to 4 units centred over the surveyed source point (nose to tail). This is determined by testing for the best data quality signal along with the frequency sweep and sweep length in time.

Table 2.1: Comparative Analysis of the Explorer 860 and Vibroseis Truck (Source: REN, 2024).

Comparison of the Polaris Explorer 860 Awd & the Sercel Nomad 68 Vibrator		
Specs	**Polaris 860**	**Nomad 65 per Unit**
Weight	11466KG	31718KG
Width	2.8 Meters	3.42 Meters
Height	2.9 Meters	3.22 Meters
	Impulse	Propagates Energy Signals into the earth
Energy type		Over an extended period of time< 30 secs
Rated Frequencies	1 to 300Hz	Selectable 1 to 250 Hz
Peak Force	3825KN	278 KN
Hold Down Weight	6332KG	28294KG
Fuel type	Diesel	Diesel
Emission Standard		EU Stage 3A/US Tier 3

Plate 2.1: The Explorer 860 was used as the energy source for the previous multiple seismic survey operations undertaken in PEL 73.

Plate 2.2: Vibroseis used as energy sources for onshore oil and gas exploration process (Source: REN, 2024).

2.2 Summary of the Baseline Receiving Local Environment

The proposed 2024 and 2025 2D/3D seismic survey areas fall within the hot semi-arid climatic zone of northern Namibia, with very hot to hot summers and mild winters. Diurnal temperatures are more pronounced in winter, than in summer. Rainfall decreases generally from north to south, with an even gradient across the flat landscape. Rainfall falls mostly in summer with no rainfall of significance between May to August. Most rain occurs between December to March, with the highest rainfall peaking in January. The annual average rainfall for the proposed project area is between 500-600 mm.

The local land uses in the general area is mainly communal / subsistence farming comprising cattle, donkeys, seasonal crop farming, grass, and wood / timber harvesting, conservancies and forestry conservation and natural resources harvesting, and very limited to no local tourism products (Fig. 2.1). The following is the summary of some of the current common general threats to the natural environment and habitats of the general project area (Plates 2.3-2.5): Accelerated allocation of communal leaseholds resulting in forestry clearing; Subsistence communal crop farming centred on forestry clearing, slash and burn practices; Wild fires linked to local human activities such clearing of the forestry for agricultures or creation of fresh grass for animal grazing; Timber and wood harvesting, and, Overgrazing due to increased number of animals.

It is estimated that at least 67 species of reptile, 32 amphibian, 116 mammal and 210 bird species (breeding residents) are known to or expected to occur in the general Kavango and West East regions of the proposed project area (Fig. 2.2). It is estimated that at least 107 species of larger trees and shrubs (>1m in height) and up to 111 species of grasses are known to or expected to occur in the general area, none of which are viewed as endemic species to the area (Figs. 2.3 and 2.4).

The proposed 2024 and 2025 2D/3D seismic survey areas fall within the greater Kalahari Sedimentary Basin which is the result of uplift of the Great Escarpment and deposition of Kalahari Group Sediments in grabens which formed during recent tectonics (Fig. 2.5). Basement rocks below the top Kalahari Group of the Kavango Sedimentary Basin are expected to be Karoo Basalts, Damara Quartzites and Dolomites and Pre-Damara Basement (Fig. 2.5). The Kalahari Basin is a vast inland basin stretching over Angola, Namibia, Zambia, Botswana, and South Africa (Fig. 2.5).

Groundwater within the Kavango Sedimentary Basin are primary aquifers of the Kalahari Group sediments and secondary aquifers as the result of faults, fractures, and weathering (Fig. 2.6). The Kalahari sediments have variable yield and water quality and have groundwater potential which is moderate to low (Figs. 2.7-2.9). Aquifers present along the rivers are saline artesian aquifers overlain by alluvium aquifers of paleo-channels of the Okavango River.

The main sources of groundwater are hand dug wells and boreholes. Groundwater is located deeper to the west than in the east. Groundwater flow of the general area is controlled by faulting of the area, with a low-gentle gradient. Boreholes in general have low yields of between 2-4m^3 / h, with average yields of 8m_3/h (Fig. 2.8). Groundwater occurring in the area is of good quality with Total Dissolved Solid (TDS) levels of 500-1000mg/l. Boreholes with poor quality water are stagnant waters, high in sodium salts. Recharge improves water quality with each recharge episode. Average borehole depth is slightly above 90m, with average water strikes at 51m and saturated thicknesses of 43m (Fig. 2.7). Borehole yields are sufficient to fulfil the water requirements of the exploration phase of ReconAfrica.

A group of archaeological heritage sites within the general proposed area are known to exist along the Omatako River basin between Ncaute and Taratara villages and south west of Omatako River basin. These sites will not be impacted by the proposed 2D seismic survey operations neither are they vulnerable nor sensitive (Fig. 2.10).

Local communities and stakeholder consultations activities were undertaken during the month of June 2024 covering Shakambu, Mutwe Ghombahe, Kawe, Gcana, Makandina, Cumezao, Ncaute, Gcigco, and Ncaute Villages and Gwatjinga and Ncaute Community Forests. Appropriate meeting delivery methods and materials were adapted for each of the public / stakeholder and community meetings undertaken. Details on the outcomes of the meetings are attached to the EIA Report.

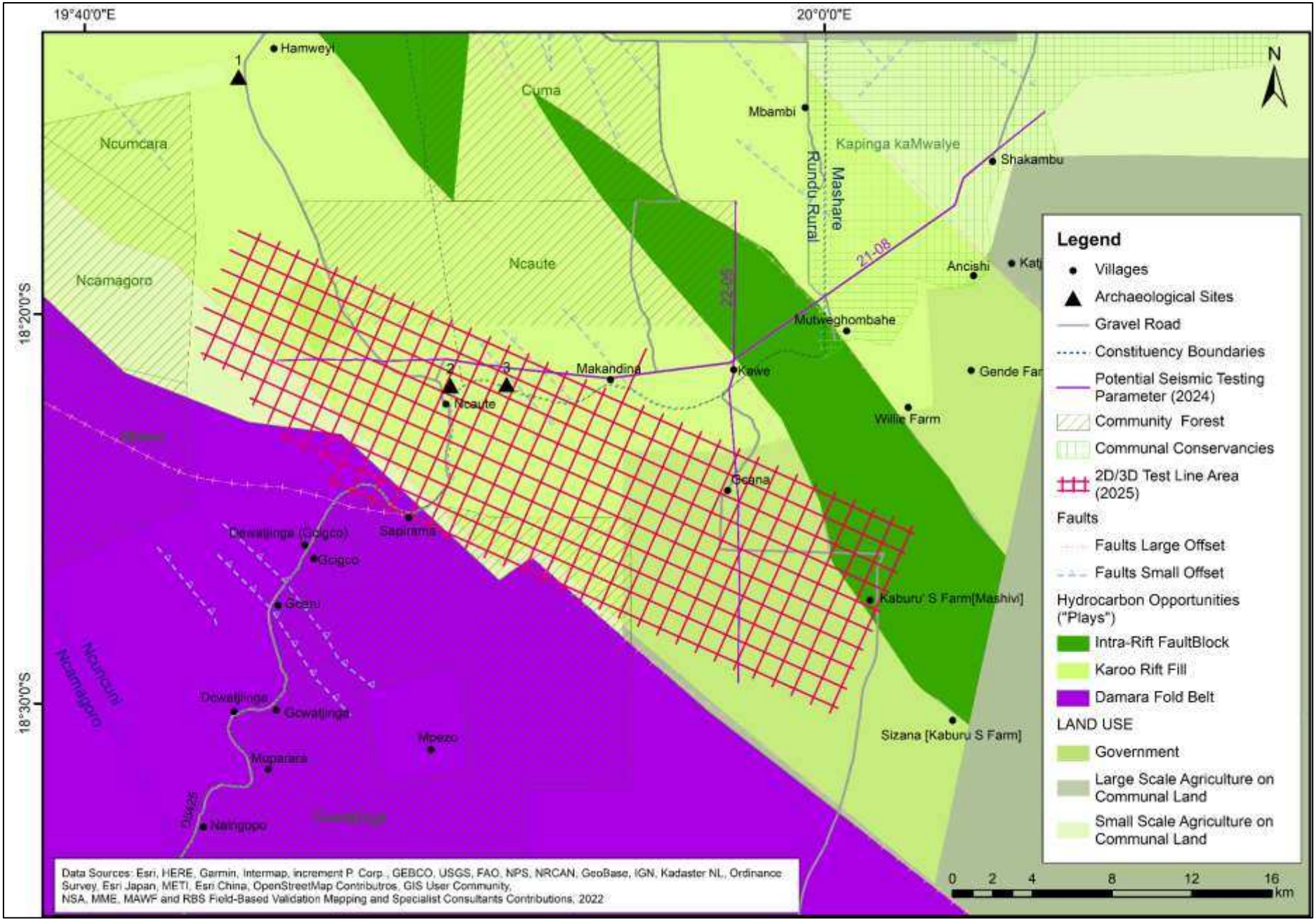


Figure 2.1: Local land uses around PEL 73, Area of Interest (AOI) and the proposed 2024 and 2025 2D/3D seismic survey operations areas with respect to the subsurface hydrocarbon plays, formal proclaimed national parks, community forests, conservancies, agriculture, settlements, and villages.

Plate 2.3: Drone view to the southwest at Makandina showing the extensive forest clearing and fossilised Omatako–Omuramba Ephemeral Channel cleared and fully cultivated for subsistence crop production between Makandina and Ncaute.

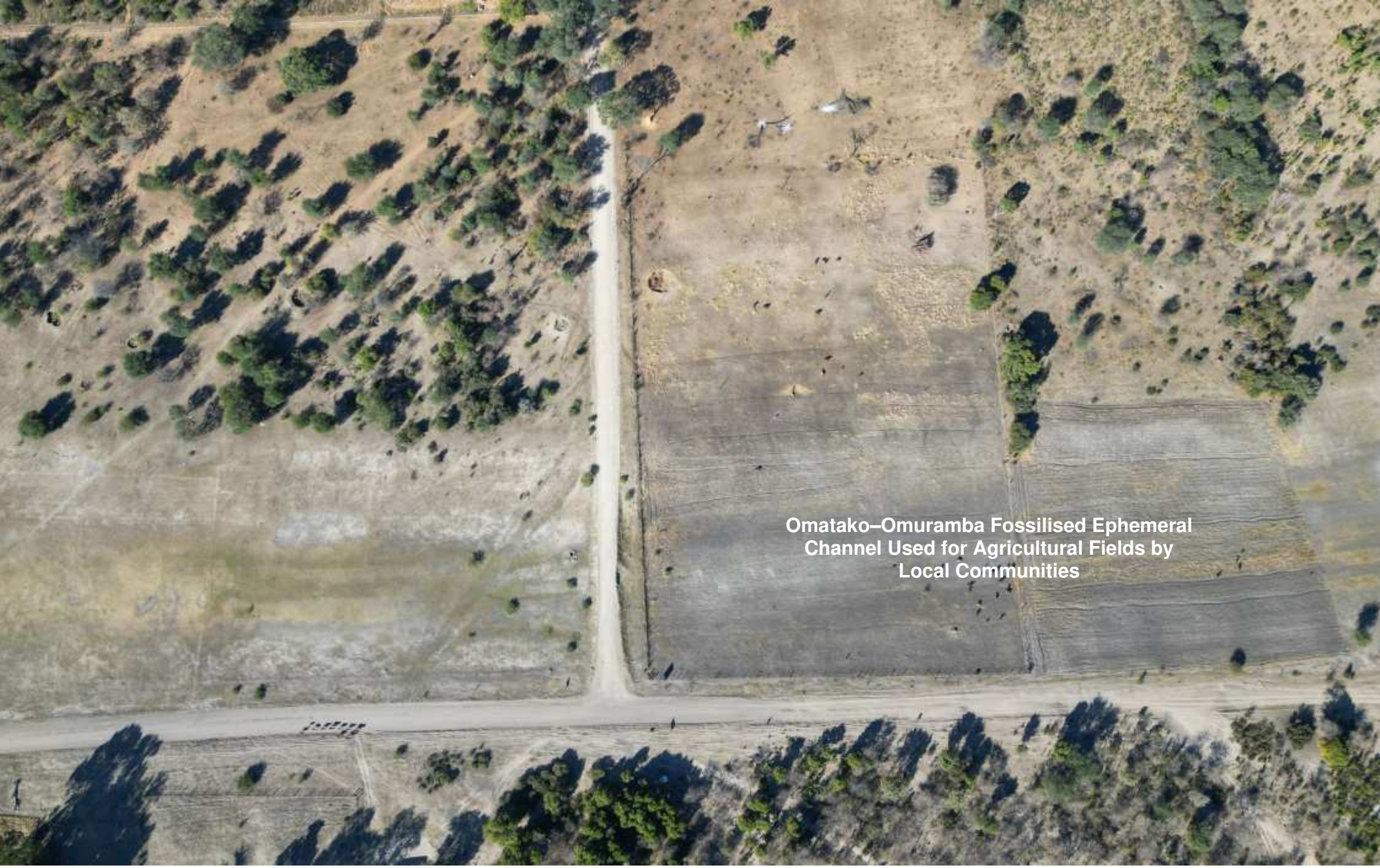


Plate 2.4: Omatako–Omuramba Fossilised Ephemeral River channel cleared and fully cultivated for crop production around Ncaute.

Plate 2.5: North of Ncaute forest clearing for settlements and subsistence agriculture commonly found around the proposed survey area.

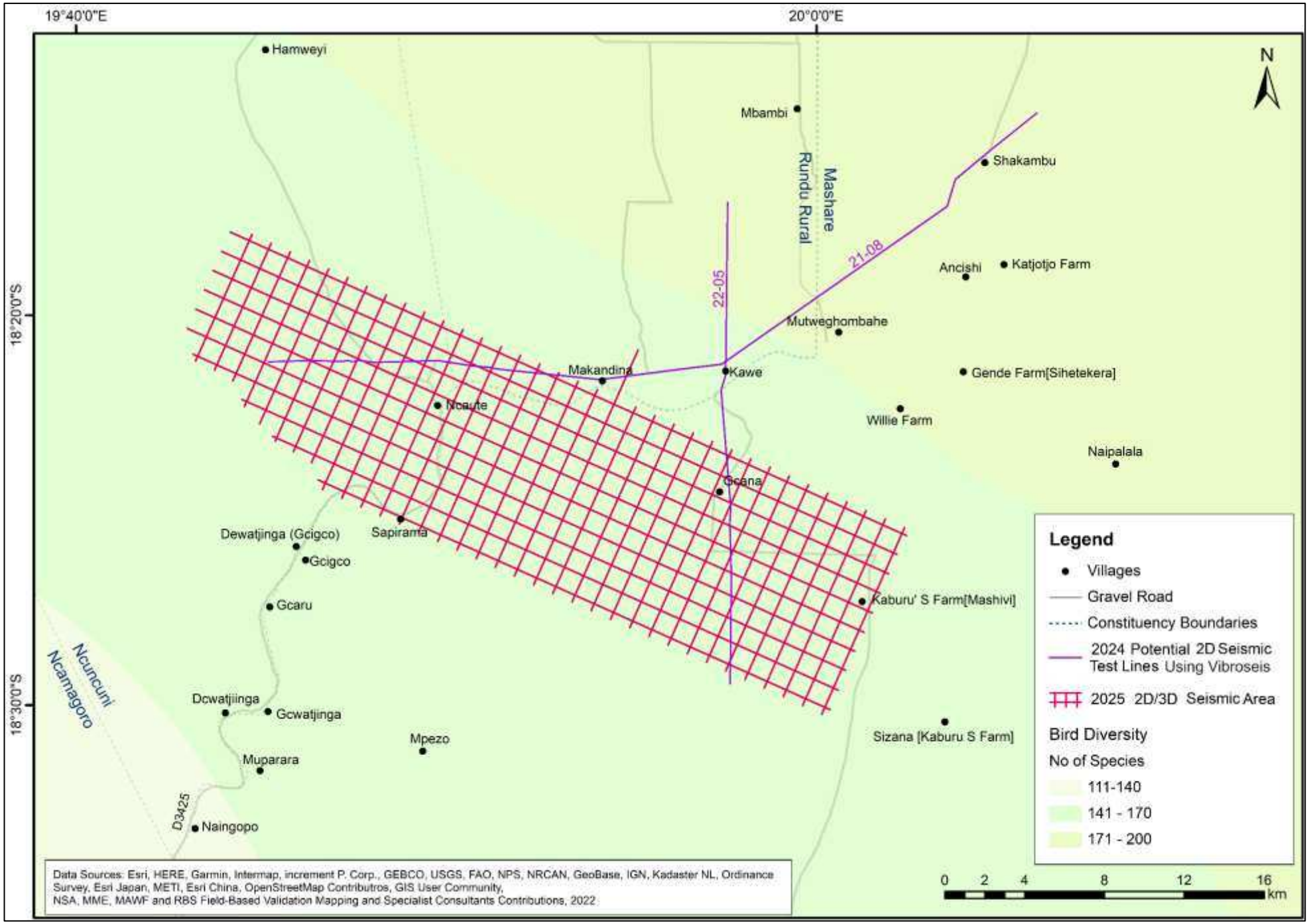


Figure 2.2: Local bird diversity around PEL 73, Areas of Interest (AOI), and the proposed 2024 and 2025 2D/3D seismic survey areas.

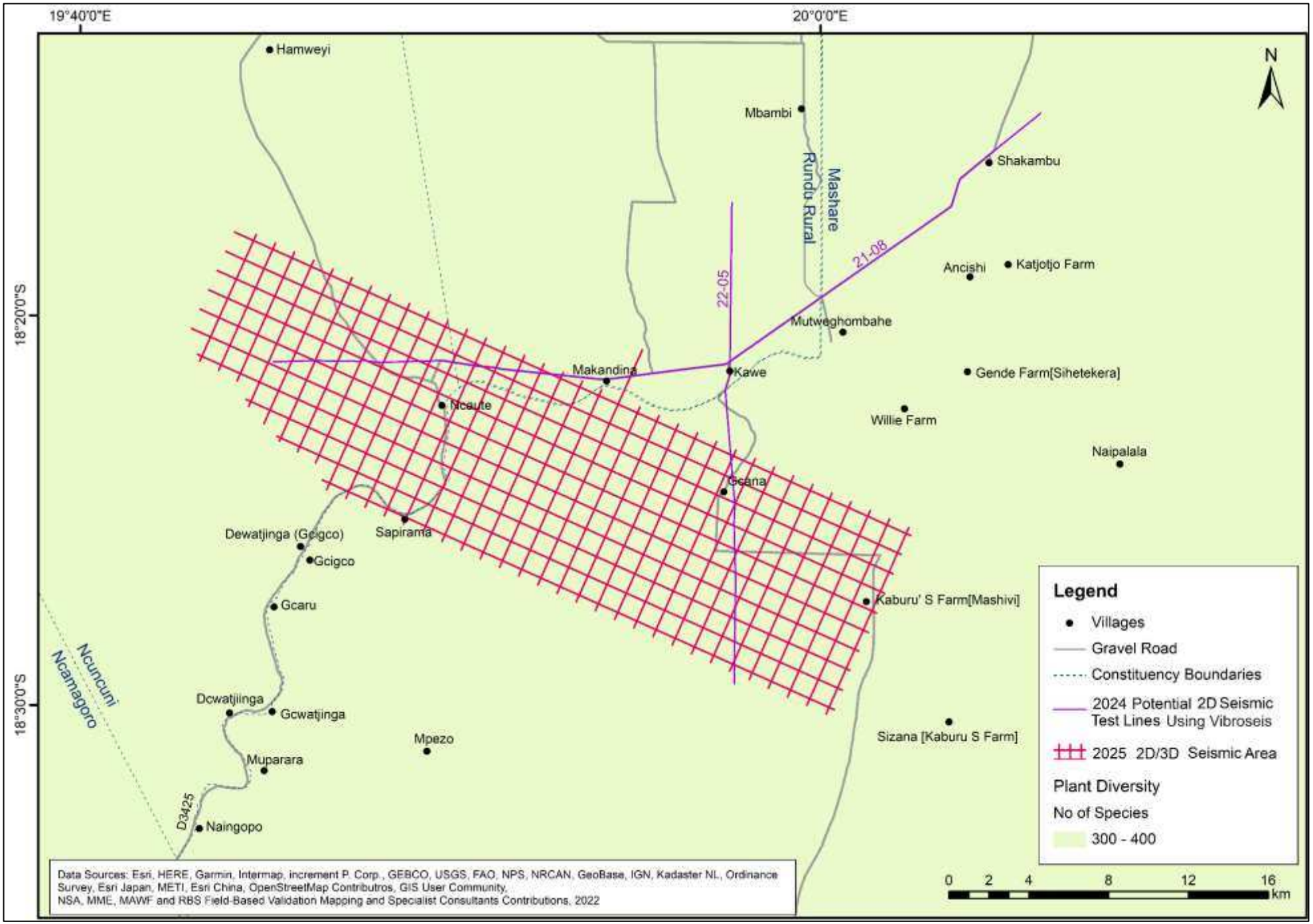


Figure 2.3: Local plant diversity around PEL 73, Areas of Interest (AOI), and the proposed 2024 and 2025 2D/3D seismic survey areas.

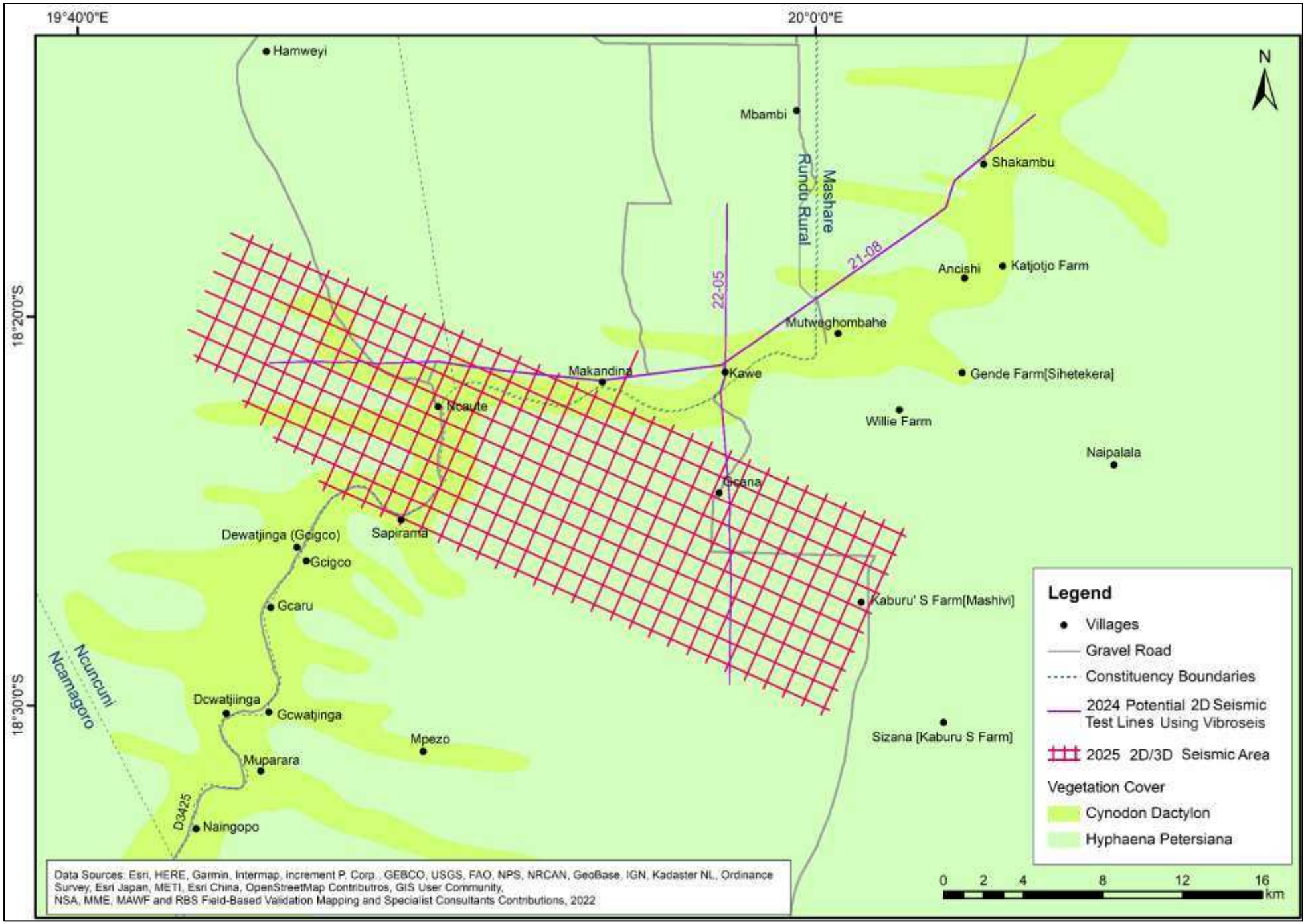


Figure 2.4: Local vegetation diversity around PEL 73, Areas of Interest (AOI), and the proposed 2024 and 2025 2D/3D seismic survey areas.

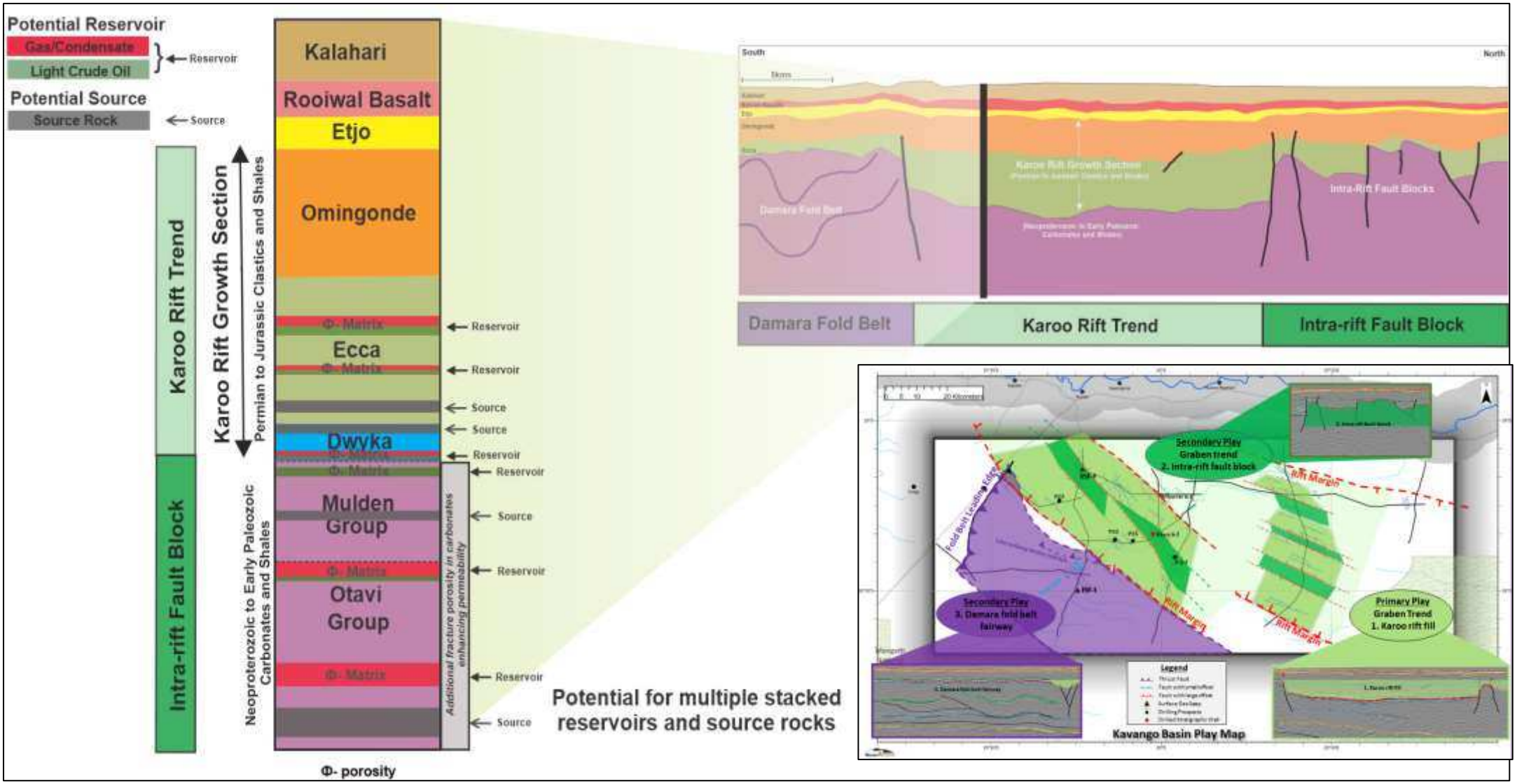


Figure 2.5: Generalised stratigraphic column for the Rift Graben areas of the Kavango basin. Six potential reservoirs and four potential source rock intervals have been identified in the rift trend and intra-rift fault blocks (Source: REN, 2022).

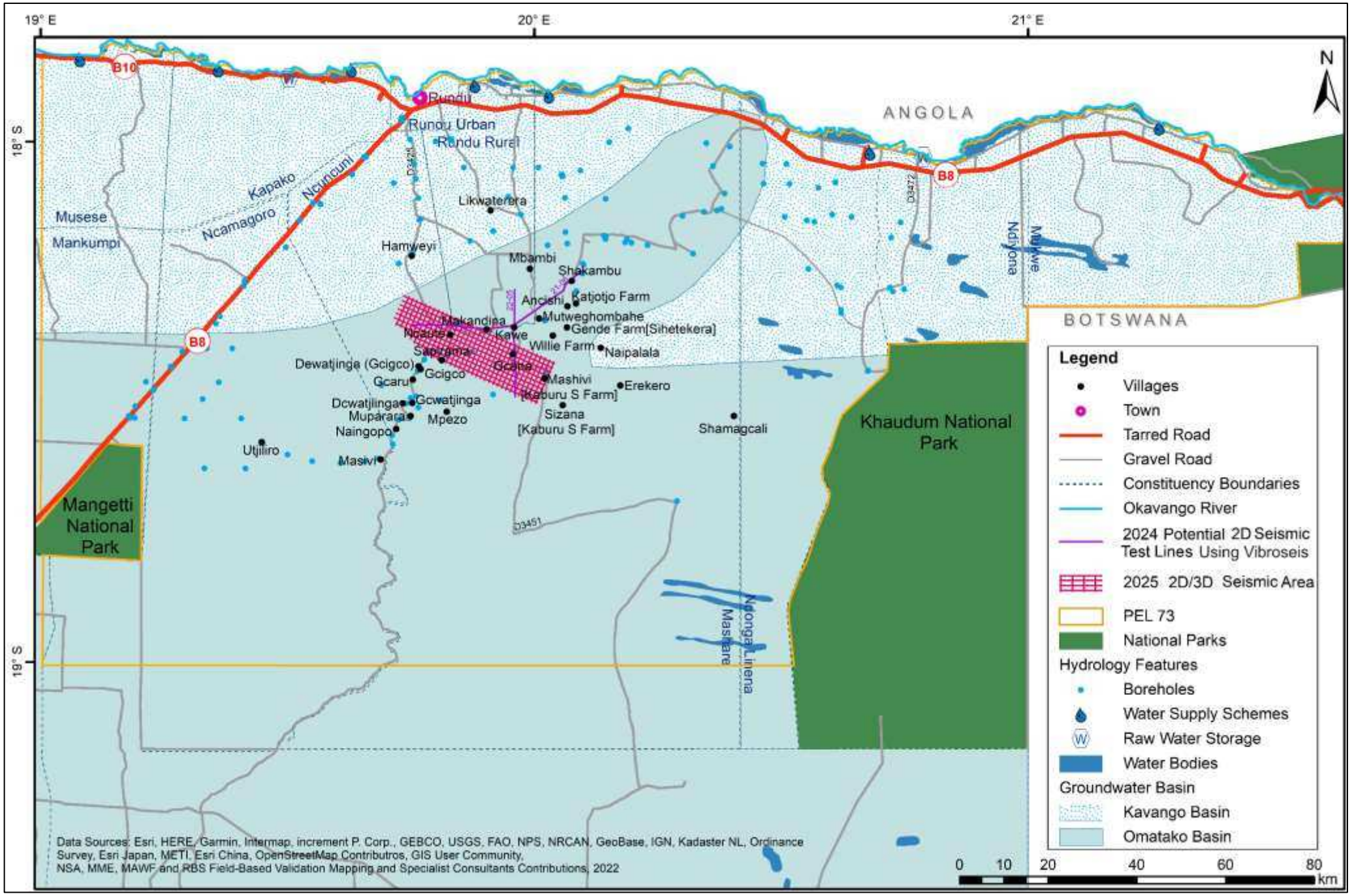


Figure 2.6: Omatako and Kavango Drainage Basins and the proposed 2024 and 2025 2D/3D seismic survey areas.

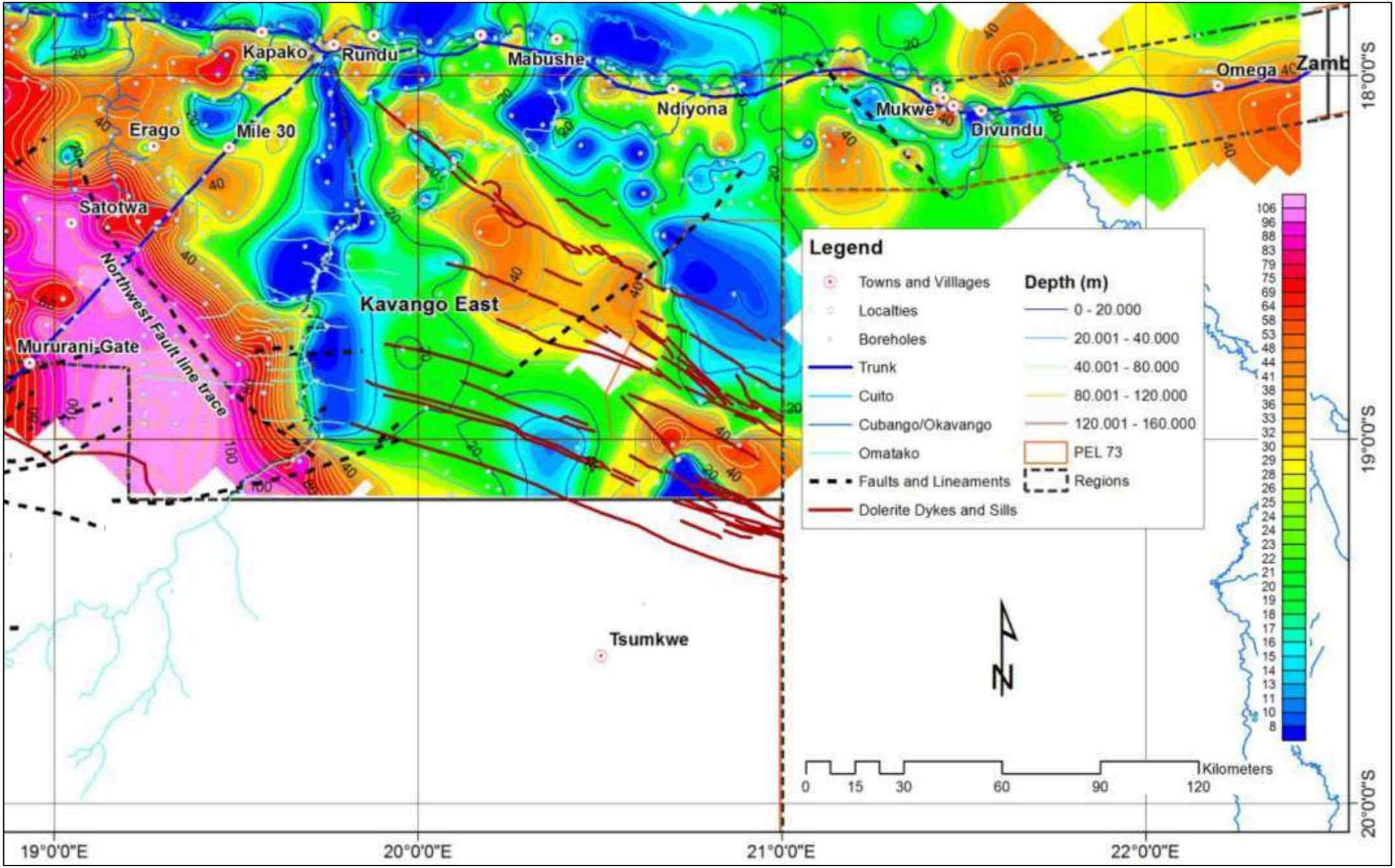


Figure 2.7: Depth to groundwater map for PEL 73 (Julius, 2021).

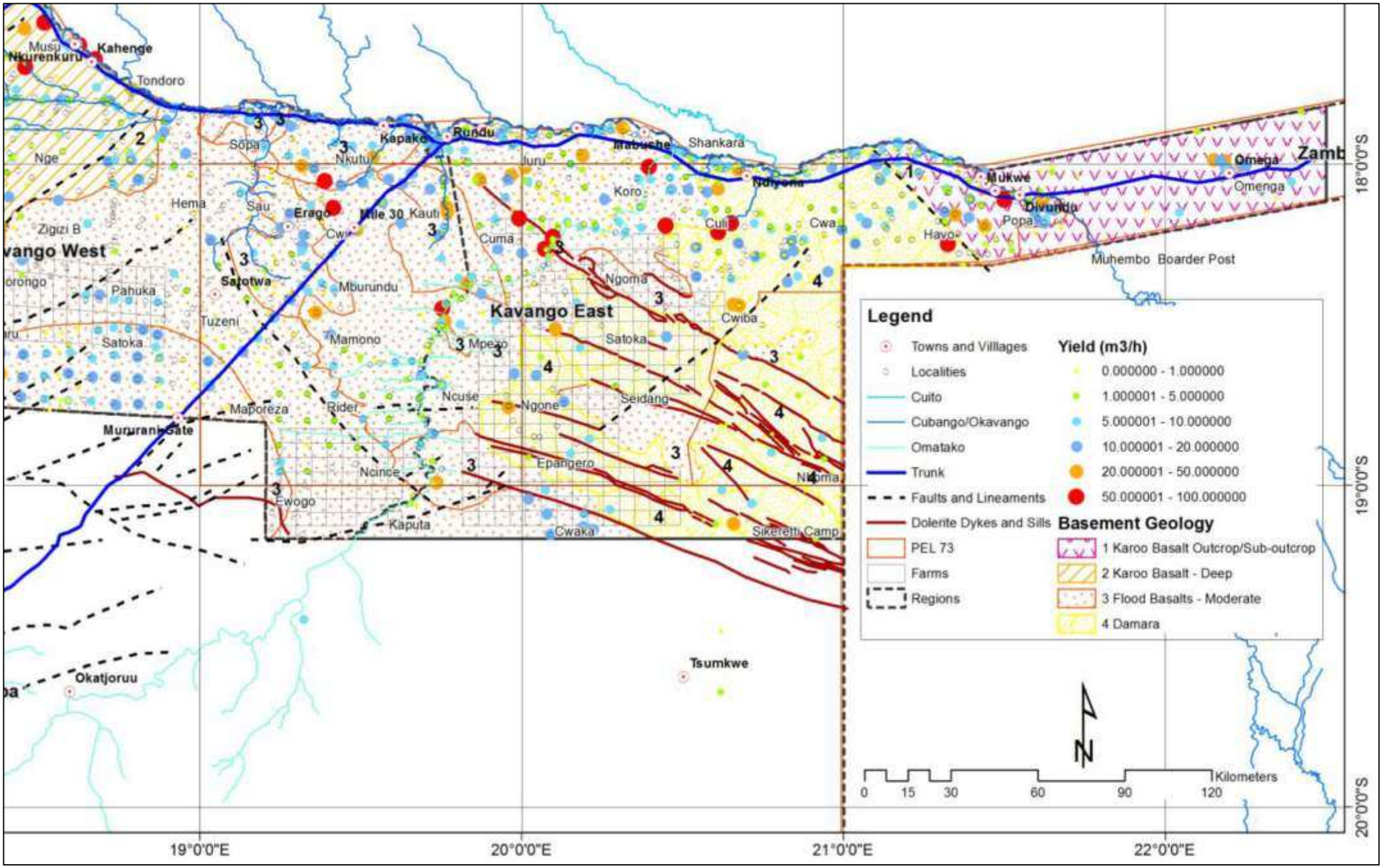


Figure 2.8: Boreholes yields for PEL 73 (Julius, 2021).

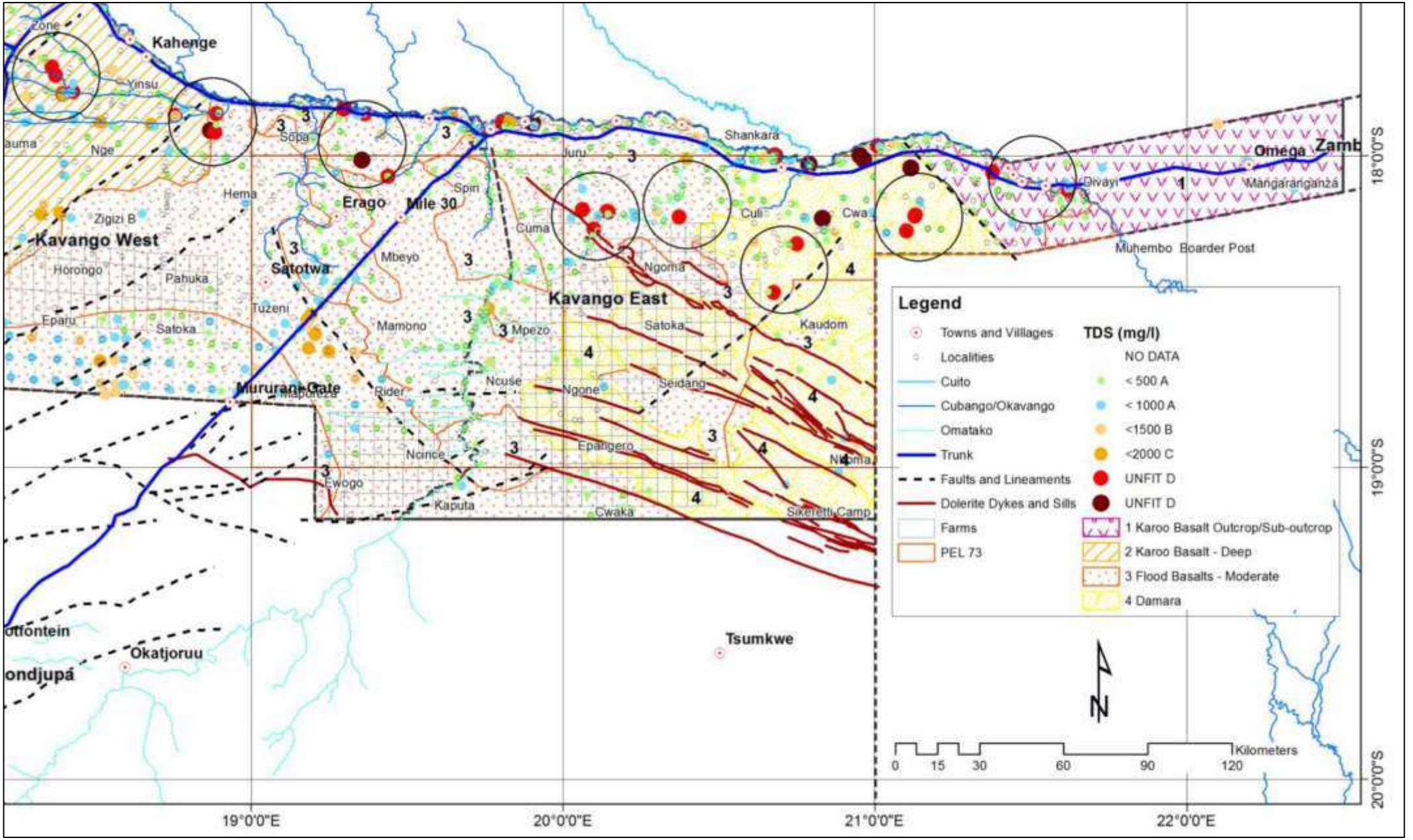


Figure 2.9: Water Quality (TDS) map of PEL 73 (Julius, 2021).

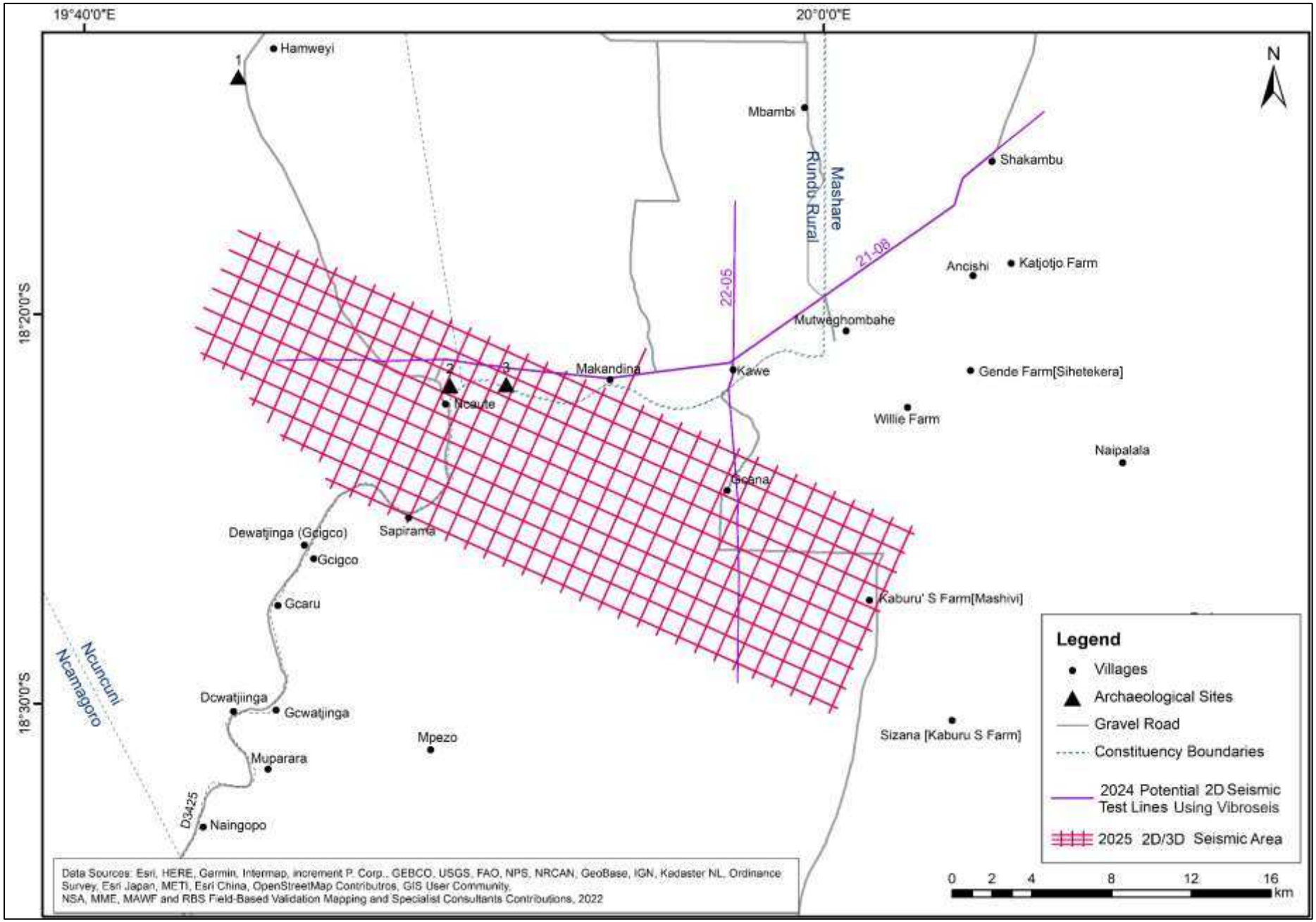


Figure 2.10: A group of archaeological sites (red dots, quantities not established) in relation to the proposed 2024 and 2025 2D/3D seismic survey operations lines (red lines) to be conducted along existing roads and tracks. The blue lines indicate the Omatako Fossilised Ephemeral River channels and MEFT restrictive defined operational area ABCDE (Nankela, 2021).

2.3 Protected and Important Areas in PEL 73

The most important areas in PEL 73, areas of interest and proposed 2024 and 2025 2D/3D seismic survey areas are (Fis. 2.1-2.10) and Plates 2.1-2.3):

1. KAZA TFCA is a multiple land use international transboundary conservation initiative with a common vision of promoting and supporting sustainable livelihoods through coexistence and utilisation of multiple resource and resources areas for the greater benefits of the local communities of the member states (www.met.gov.na). KAZA TFCA is a transboundary initiative covering portions of Angola, Botswana, Namibia, Zambia, and Zimbabwe. The key multiple surface resources use areas found within KAZA TFCA includes: National parks, game reserves, forest reserves, conservancies, game/wildlife management areas, communal lands, but also subsurface resources such as water, minerals, geothermal energy, and petroleum that have not been acknowledged in the vision. Key targeted beneficiaries of the KAZA TFCA initiative are the local people especially the rural communities living around these resources and whose livelihoods are dependent on seasonal subsistence agriculture, animal husbandry, fishing, natural resource harvesting, tourism, trading, and hunting.

   The overall KAZA TFCA vision is still a work in progress because the beneficiaries who are the local communities continue to languish in poverty at the doorsteps of KAZA, as seen around the current areas of operations covered by the completed Phase I 2D seismic survey and the proposed 2024 and 2025 2D/3D seismic survey areas and in many parts of the Kavango East and West and Zambezi Regions that are supposed to be thriving within the boundary of KAZA TFCA. Based on the field-based assessments conducted as parts of the various EIA studies around the project area, the tourism benefits in the name of KAZA TFCA are in the hands of international, regional, and national connected operators, NGOs, foreigners, and non-indigenous selected individuals. It remains to be seen when such benefits will start making some positive socioeconomic impacts on the lives and livelihoods of most of the rural communities who were supposed to benefit from such tourism resources and if this will even ever happen.

   In Namibia and in other KAZA TFCA member states, the exploration and utilisation of potential subsurface resources under KAZA TFCA, are allowed, except in the formally national member state proclaimed sensitive areas such as national parks. Sensitive areas within the Namibian portion of KAZA TFCA are known and the Areas of Interest (AOI) and the proposed 2024 and 2025 2D/3D seismic survey operations in PEL 73 have no negative environmental consequence on the sensitive land use of KAZA TFCA because the operations fall outside formally proclaimed sensitive national parks. The survey areas cover the communal land and the proposed 2024 and 2025 2D/3D seismic survey lines will not extend in national parks boundaries.

2. The Okavango River is viewed as a site of special ecological importance in Namibia due to its biotic richness, threatened plants and insects (Curtis and Barnard 1998). The Okavango River area is not part of the area of interest and proposed 2024 and 2025 2D/3D seismic survey will not be conducted near this river. A self-imposed 10 km buffer from the Okavango River and any exploration activities will always be observed by the Proponent.

3. Omuramba-Omatako Fossilised Ephemeral River networks are viewed as sites of special ecological importance in Namibia due to its biotic richness, large mammals, high value for human subsistence agriculture and tourism (Curtis and Barnard 1998). Unfortunately, the general area has been heavily degraded by subsistence agriculture and the proposed 2024 and 2025 2D/3D seismic survey operations will not be conducted along the Omuramba-Omatako Fossilised Ephemeral River networks. Survey lines will generally cut across the Omuramba-Omatako Fossilised Ephemeral River networks.

4. Ephemeral pans are viewed as sites of special ecological importance in Namibia due to their biotic richness, endemic crustacean, Red Data birds, habitat and resource for humans and wildlife (Curtis and Barnard 1998). Although important larger pans such as Nyae Nyae, etc. fall outside the general area, all other smaller pans are also viewed as important habitat and will easily be excluded from the proposed survey operations.

5. The Khaudum National Park falls within the North-Eastern Kalahari Woodlands vegetation type with Omurambas which act as ideal routes for wildlife. Dominant trees include: *Acacia erioloba, Adansonia digitata, Baikiaea plurijuga, Combretum imberbe*, *Guibourtia coleosperma* and *Spirostachys africana*. Important wildlife includes: African wild dog, leopard, lion, spotted hyaena, side-striped jackal, elephant, giraffe, blue wildebeest, eland, kudu, oryx, red hartebeest reedbuck, roan, tsessebe and warthog. Important birds include: Abdim's stork, African golden oriole, African hobby falcon, Bradfield's hornbill, ground hornbill, lesser spotted eagle, racket-tailed roller, steppe eagle and yellow-billed kite (www.met.gov.na). The Khaudum National Park is excluded from PEL 73. No petroleum exploration activities will be conducted in any formally proclaimed national park.

6. The Mangetti National Park falls within the North-Eastern Kalahari Woodlands vegetation type with the vegetation on the dune crests markedly different to that in dune valleys – i.e. Kalahari woodland vegetation dominates the dune crests, whereas mixed acacia savannah vegetation characterises the dune valleys. Dominant trees include: *Acacia erioloba, Acacia mellifera, Combretum collinum, Commiphora* species, *Schinziophyton rautanenii* and *Terminalia sericea.* Important wildlife includes: African wild cat, leopard, spotted hyaena, blue wildebeest, common duiker, kudu, oryx, sable, steenbok and occasional elephant and wild dog. Important birds include: bateleur, lapped-faced vulture, tawny eagle, Meyer's parrot, and striped kingfisher (www.met.gov.na). The Mangetti National Park is excluded from PEL 73. No petroleum exploration activities will be conducted in any formally proclaimed national park.

7. Undisturbed area: The general area is not pristine anymore due to prolonged human impact (e.g. settlements, slash-and-burn farming practices, unseasonal fires, etc.), especially along the perennial Okavango and ephemeral Omuramba Omatako Rivers, and more recently along the various tracks and roads throughout the area. However, there are some areas far from the rivers and tracks/roads which have less human impact (albeit not pristine), and viewed as more important. Creating new tracks and/or firebreaks in these areas would result in the destruction of numerous protected tree species as well as result in access to these areas leading to further settlements as well as illegal harvesting and poaching and overall environmental destruction.

7. Communal Conservancies: Although there are several communal conservancies in the general area, the Kapinga kaMwalye Communal Conservancy is the closest. This conservancy was established in 2018 although it has no main source of cash income (METF/NACSO 2021, www.nacso.org.na). Seismic Lines 3 and 5 north extensions and part of the Line 2 (to join Line 107) fall within the Kapinga kaMwalye Communal Conservancy.

8. Community Forests: The following community forests are located in the general area: Hans Kanyinga (277km^2), Ncaute (118km^2), Cuma (116km^2), Gcwatjinga (341km^2), George Mukoya (486km^2) and Likwaterera (138km^2) (METF/NACSO 2021www.nacso.org.na).

9. Protected tree species: The most important larger tree and shrub species expected to occur in the general area include all those formally protected with the most important species viewed as Baikiaea plurijuga, Burkea africana, Guibourtia coleosperma, Dialium engleranum, Philenoptera violacea, Pterocarpus angolensis, Schinziophyton rautanenii, Sclerocarya birrea and Strychnos species. Of these, the most important species, classified as Lower Risk/Near Threatened by the IUCN (2020), are viewed as Pterocarpus angolensis (African teak or Kiaat) (De Cauwer et al. 2014) and Baikiaea plurijuga (Zambezi/Rhodesian Teak) due to numbers having decreased due to overutilization for wood production; elephant damage and unseasonal human induced fires.

   Due to the high density of protected tree species in the general area and to minimise the overall impact of the habitat destruction associated with the proposed seismic developments, creating "new" tracks and a "new" cutline should be avoided. Gathering of seismic data along existing tracks/roads throughout the area would result in less environmental degradation than clearing new access routes. Widening some of the existing tracks/roads throughout the general area for firebreaks without the extensive clearing of virgin bush which would result in large numbers of protected tree species being felled; increase access into the area resulting in further environmental degradation, etc. would result in less environmental degradation than clearing new cutlines.

2.4 Summary of the Impact Assessment Results

2.4.1 Characterisation of the Impact Assessment Components Inputs

The assessment process took into consideration the interactions of the proposed activities with respect to the Knowledge-Based System Model Methodology (KBSMM) characterised climatic, environmental, and ground model datasets of the receiving environment (physical, biological, socioeconomic and ecosystem services and functions).

The influence assessment of the characterised components of the environment has been based on a Knowledge-Based System Model Methodology (KBSMM), a research-based and tested / validated Artificial Intelligent (AI) framework. The KBSMM model inputs variables covered characterised climatic, environmental, and ground model datasets.

The Source-Pathway-Receptor risk assessment approach was used to determine or validate the influence (impact assessment), and ultimate likely harm that may be linked to the activities of each of the various stages of the proposed 2024 and 2025 2D/3D seismic survey implementation process (Fig. 2.11).

2.4.2 Climatic Data Sets/Components Inputs

The climatic data sets that have been used in the regional and local site-specific assessment process comprised precipitation, temperature, evapotranspiration and wind data sets. The following is summary explanation of the roles that climatic data sets may have the proposed 2024 and 2025 2D/3D seismic survey implementation process (Fig. 2.11):

- Temperature: Temperature had a direct influence on the fluids that may influence the operation of the site by supporting evapotranspiration. It also has an influence on the planning, operation and implementation of the various project activities.

- Rainfall: Rainfall is one of the data sets used in the water balance assessments with respect to potential fluid production and flash flood occurrences. The data sets had some influence on mobilisation pollutants that may be associated with the proposed project activities.

- Evapotranspiration: This combined effect of evaporation and transpiration is important in water balance assessments with direct influences on the implementation of the various project activities, and.

- Wind Direction and Speed: The direction and speed of the prevailing winds may be critical to the site operations and determination of the optimum operational requirements. The data had a direct influence on the site operations including dust and noise management.

2.4.3 Environmental Data Sets/Components Inputs

The regional or local environmental data sets used in this project comprise economic activities (Proposed 2024 and 2025 2D/3D seismic survey) and coordination support available in the region or area, types and amounts of waste generated, likely contaminants from the activities, ecological, habitats and ecosystems including fauna and flora as well as community considerations such, land ownership, social, health and safety, archaeological, cultural and political issues.

The following is summary explanation of the role of the environmental data sets may have on the proposed 2024 and 2025 2D/3D seismic survey implementation process (Fig. 2.11):

- Economic activities and logistic support: The types of economic activities and logistical support services and infrastructure for the proposed activities are a key source component of the environmental data sets in the determination of the likely impacts on the receptors.

- Types and amount of waste: Understanding the characteristics of the liquid and solid waste streams be handled is vital in the evaluation of the hazard exposure in terms of the overall risk to the receptors.

- Likely contaminants: The state (solid, gas, liquid, or vapour) of any likely contaminants that may associated with the proposed activities play a major role in the determination of the likely harm, mitigation, monitoring and reporting strategies.

- Ecological, habitats, ecosystems, fauna, flora, and local, regional or global Climate Change influences: Namibia and the Kavango East and West Regions have number of unique and protected habitats, ecosystems, fauna and flora and highly vital as they support other sectors of the national economy such as tourism, agriculture, food security and services. Understanding the likely level of sensitivity of the regional or local survey areas / lines is highly important to the successful determination of the likely impacts and harm, development mitigation measures, monitoring and reporting strategy, and.

- Community considerations: Local community issues and acceptability of the proposed activities by the local community is of vital importance. Other key components of the community considerations include: Land ownership (State land / Communal or Private), land use, local social settings, labour, natural capital, human rights, public and workers' health and safety, archaeological, cultural, political, and civil society influences.

As part of the data collection, evaluation, influence and risk assessment process of each of the proposed survey lines-specific, determination of the mitigation measures, monitoring and reporting strategies, specialist studies conducted as part of the EIA process provided vital recommendations incorporated as detailed in the EIA and with mitigation measures provided in this EMP Report.

2.4.4 Ground Data Sets/Components Inputs

The ground data sets covered regional/local solid and surficial geology, geomorphological / topographic settings, hydrology (surface water), hydrogeology groundwater), geotechnical characterisation of rocks and soils, weathering profiles and availability of construction materials, and discontinuities such as faults, joints, fractures, and bedding planes of the drilled sites (Fig. 2.11).

The geology (solid and superficial) and water (surface and groundwater resources are all targets that may be influenced (impacted) by the various activities of the proposed 2024 and 2025 2D/3D seismic survey implementation.

Other ground components which include the local terrain (geomorphology and topographic features), discontinuities, geotechnical as well as the mineralogy will aid the influence of sources in causing or minimising the impacts to be controlled through mitigations (Fig. 2.11).

Regional/local solid and surficial geology, geomorphological and topographic settings also linked directly to the availability of local construction and operational materials in support of the proposed 2024 and 2025 2D/3D seismic survey project implementation lifecycle (Fig. 2.11).

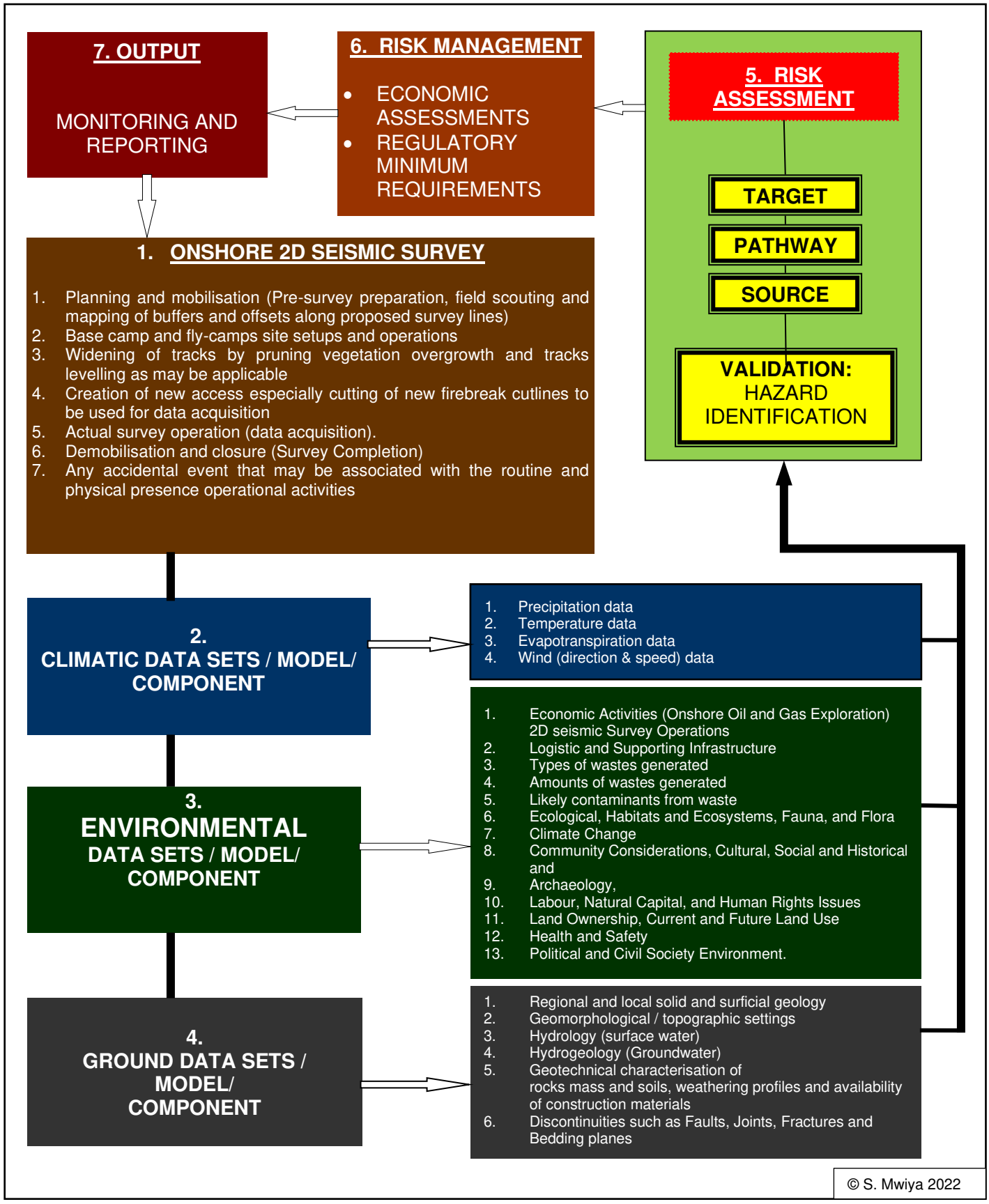


Figure 2.11: Detailed outline of the technical methodology based on a complete looped Knowledge-Based System Model Methodology (KBSMM) used in the impact assessment, risk assessment and determination of the monitoring and reporting strategy. The system model methodology has a built-in looping that allows for the evaluation of a full onshore 2D seismic survey operations project lifecycle.

2.4.5 Source-Pathway-Receptor Risk Assessment, Harm and Monitoring

To evaluate the level of influence (impact), risk, and harm that the proposed 2024 and 2025 2D/3D seismic survey implementation, the assessment process was focused on the sources, pathways, and targets / receptor chains (Fig. 2.12). It is important to note that in the absence of any of the interlinked three (3) components (sources, pathways, or targets/ receptor) there is no harm or risk to mitigate, monitor or manage (Figs. 2.12 and 2.13). The risk source/s refers to knowledge - based identified potential hazards that may be present and can cause harm to the exposed target/s / receptors (Fig. 2.13). The risk pathway refers to the route direct or indirect though which the risk source/s may be transferred and exposed to a target/s of concern. The risk target/s or receptor/s refers to the destination (area point of exposure) at which the source/s may cause harm. The characterisation of source/s, pathway/s and target/s chain has been undertaken for climatic, environmental and ground model data components.

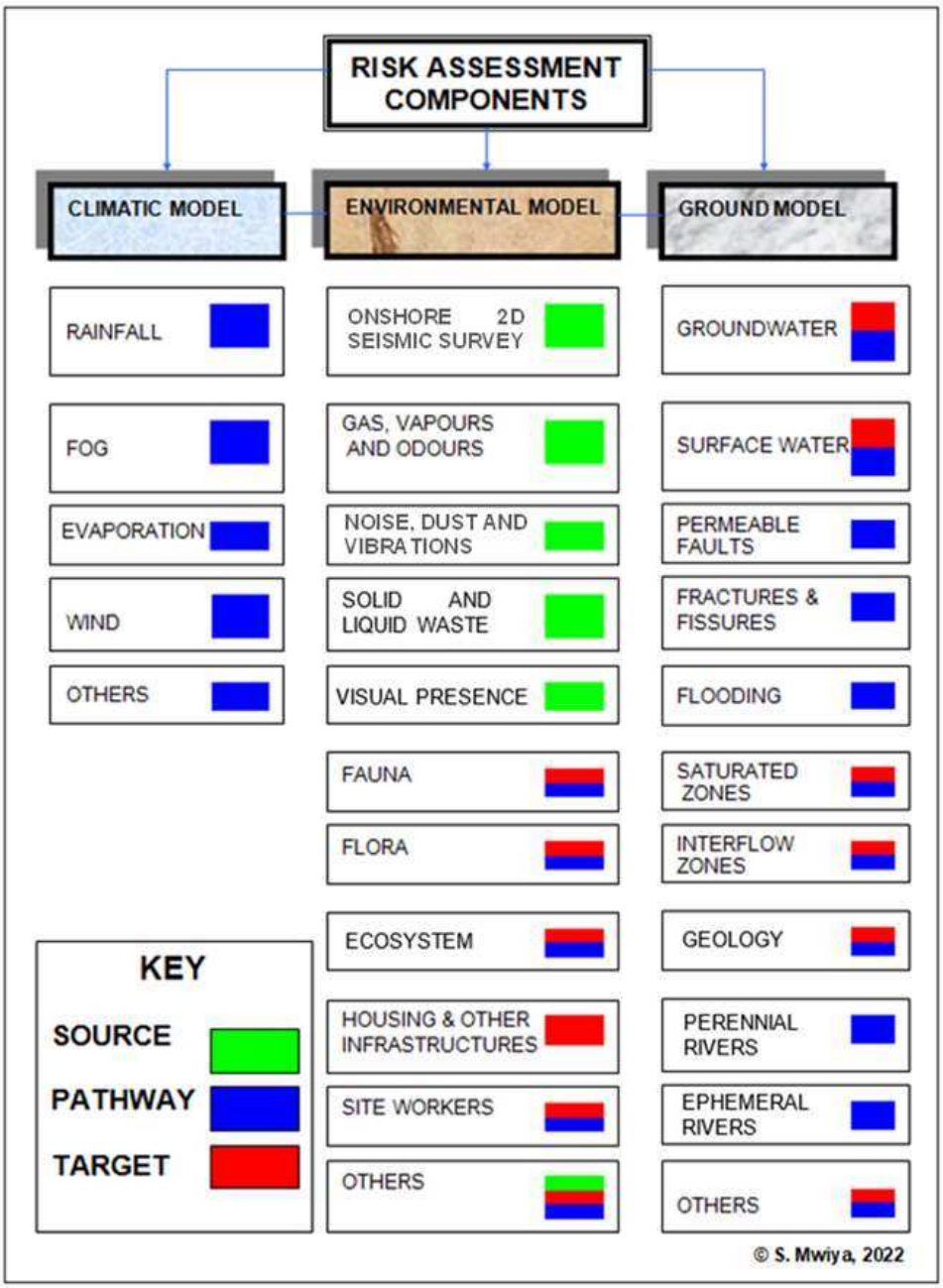


Figure 2.12: A Knowledge-Based System Model Methodology (KBSMM) characterised interactive risk assessment system output research-based and tested / validated Artificial Intelligent (AI) framework windows for onshore oil gas proposed 2024 and 2025 2D/3D seismic survey implementation.

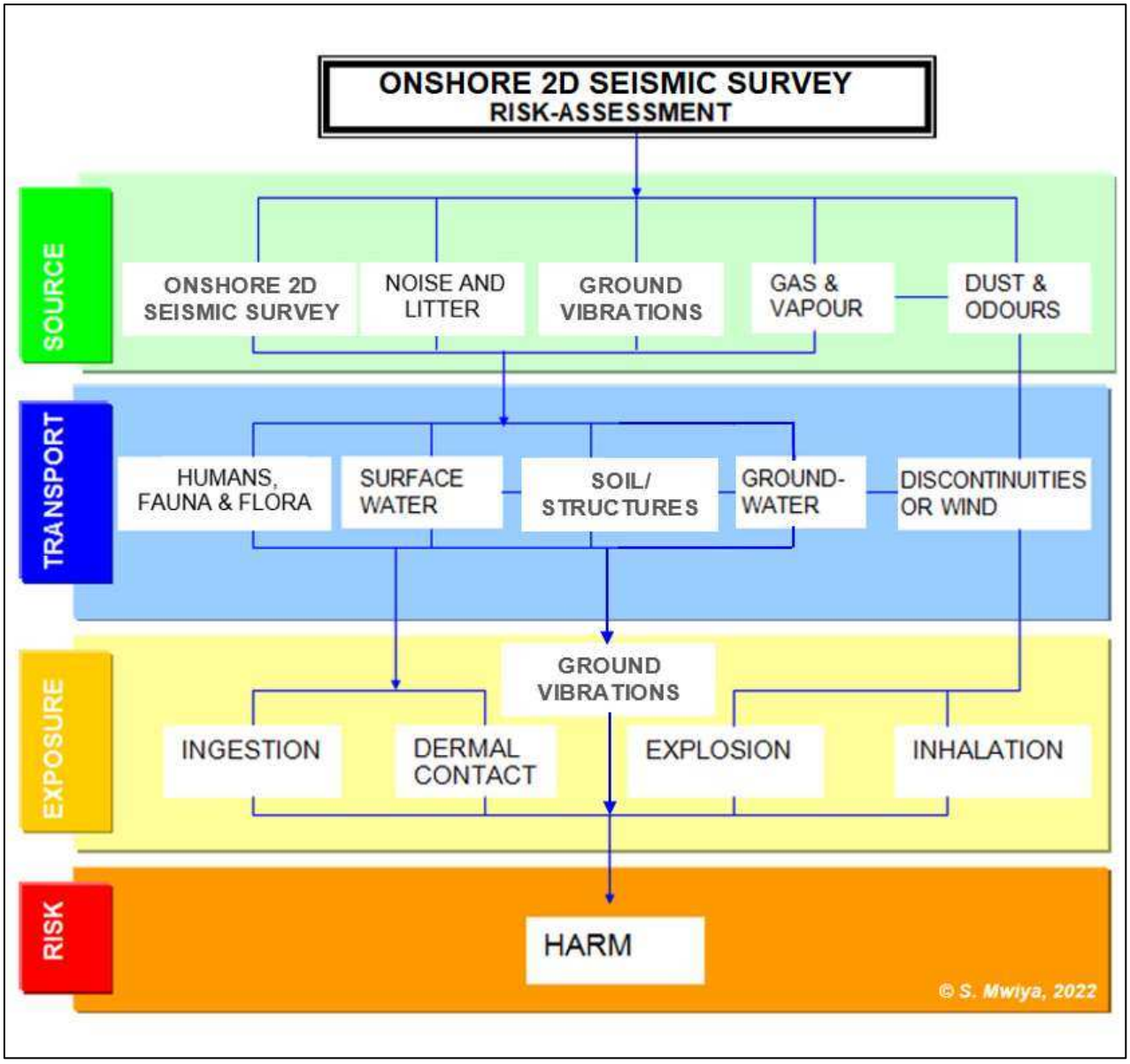


Figure 2.13: A Knowledge-Based System Model Methodology (KBSMM) characterised system output research-based and tested / validated Artificial Intelligent (AI) framework risk consequences (harm) pathways to the receiving target/receptors windows for onshore oil gas proposed 2024 and 2025 2D/3D seismic survey implementation.

2.4.6 Individual Components Impact Assessment Criteria

Based on the Terms of Reference and individual components impact assessment outputs of the KBSMM for the proposed 2024 and 2025 2D/3D seismic survey and the lessons learned (created knowledge-base) from the previous Phases I, II and III 2D seismic surveys operations, all key components of the receiving environment were identified and assessed with respect to the overall proposed activities and likely significant impacts on the receiving environment with the aim of developing appropriate mitigation measures as detailed in the EMP Report.

2.4.7 Overall Component and Significant Impact Assessment

2.4.7.1 Overall Component Impact Assessment

The overall component impact assessment and evaluation process has been undertaken by considering the activities of the proposed 2024 and 2025 2D/3D seismic survey operations as the overall source of impact (Figs. 2.11-2.13). As illustrated in Figs. 2.11-2.13, the receiving environment has been considered as the receptor / target that may be impacted positively or negatively by the activities of the proposed 2024 and 2025 2D/3D seismic survey operations.

The components of the receiving environment encompassed the following:

- Physical Conditions / Natural Environment – Air, noise, water, green space, climate change, built environment – houses, roads, transport systems, buildings, infrastructure, etc.
- Biological Conditions: fauna, flora, habitats, and ecosystem - services, function, use values and non-use etc., and.
- Socioeconomic Conditions: Social, economic, labour, gender, human rights, natural and social capital, archaeological, cultural resources, and cultural issues

In evaluating the degree of potential negative impacts, the following factors have been taken into consideration:

- Impact Severity: The severity of an impact is a function of a range of consideration, and.
- Likelihood of Occurrence (Probability): How likely is the impact to occur?

In evaluating the severity of potential negative environmental impacts, the following factors have been taken into consideration:

- Receptor/ Resource Characteristics: The nature, importance, and sensitivity to change of the receptors / target or resources that could be affected.
- Impact Magnitude: The magnitude of the change that is induced.
- Impact Duration: The time period over which the impact is expected to last.
- Impact Extent: The geographical extent of the induced change, and.
- Regulations, Standards and Guidelines: The status of the impact in relation to regulations (eg. discharge limits), standards (eg. environmental quality criteria) and guidelines.

The overall impact severity has been categorised using a subjective scale as shown in Table 2.21 for magnitude, Table 2.3 for duration and Table 2.4 for extent.

Table 2.2: Scored on a scale from 0 to 5 for impact magnitude.

SCALE (-) or (+)		DESCRIPTION
0		no observable effect
1		low effect
2		tolerable effect
3		medium high effect
4		high effect
5		very high effect (devastation)

Table 2.3: Scored time over which the impact is expected to last.

SCALE (-) or (+)		DESCRIPTION
T		Temporary
P		Permanent

Table 2.4: Scored geographical extent of the induced change.

SCALE (-) or (+)		DESCRIPTION
L		limited impact on location
O		impact of importance for municipality.
R		impact of regional character
N		impact of national character
M		impact of cross-border character

The likelihood (probability) of the pre-identified events occurring has been ascribed using a qualitative scale of probability categories (in increasing order of likelihood) as shown in Table 2.5. Likelihood of an impact occurring is estimated on the basis of experience (existing knowledge-base) and/ or evidence that such an outcome has previously occurred. Impacts resulting from routine/planned events are classified under category (E).

Table 2.5: Summary of the qualitative scale of probability categories (in increasing order of likelihood).

SCALE (-) or (+)		DESCRIPTION
A		Extremely unlikely (e.g., never heard of in the industry)
B		Unlikely (e.g., heard of in the industry but considered unlikely)
C		Low likelihood (e.g., such incidents/impacts have occurred but are uncommon)
D		Medium likelihood (e.g., such incidents/impacts occur several times per year within the industry)
E		High likelihood (e.g., such incidents/impacts occur several times per year at each location where such works are undertaken)

The overall individual components impact assessment with respect to the impact duration, geographical extent and probability of occurrence have been categorised using a semi quantitative approach as shown in Table 2.6 and the detailed results are presented in the EIA Report under Chapter 6.

2.4.7.2 Overall Significant Impact Assessment

The determination of the significance of the negative impacts / key issues caused by the proposed 2024 and 2025 2D/3D seismic survey activities as key sources of such impact has been based on the environmental baseline results such as the intensity and duration of the likely negative impact as assessed under individual components likely to be impacted (Table 2.6).

The assessment focused on the degree to which the proposed project activities are likely to result in unwanted consequences on the receptor, covering the receiving environment (natural, built, socioeconomic, flora, fauna, habitat, and ecosystem). The overall significant impact assessment of the individual components has been assessed and presented as shown in Table 2.7.

Table 2.6: KBSMM impact assessment matrix used for assessing the overall likely impacts that the proposed 2024 and 2025 2D/3D seismic survey activities will have on the individual components of the receiving environment sensitivity (physical, biological, socioeconomic, cultural, and archaeological environments) with respect to duration, geographical extent, and probability occurrence.

RECEIVING ENVIRONMENT SENSITIVITY

SENSITIVITY RATING		CRITERIA
1	Negligible	The receptor or resource is resistant to change or is of little environmental value.
2	Low	The receptor or resource is tolerant of change without detriment to its character, is of low environmental or social value, or is of local importance.
3	Medium	The receptor or resource has low capacity to absorb change without fundamentally altering its present character, is of high environmental or social value, or is of national importance
4	High	The receptor or resource has moderate capacity to absorb change without significantly altering its present character, has some environmental or social value, or is of district/regional importance.
5	Very High	The receptor or resource has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental or social value, or is of international importance.

SOURCES OF POTENTIAL IMPACT				PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL, AND ARCHAEOLOGICAL ENVIRONMENT				
				Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional, and national socioeconomic settings	Subsistence Agriculture	Community Forest	Tourism and Recreation	Cultural, Biological and Archaeological Resources
	ROUTINE AND PHYSICAL PRESENCE OPERATIONAL ACTIVITIES	1.	Planning and mobilisation (Pre-survey preparation, field scouting and mapping of buffers and offsets along proposed survey lines)																
		2.	Base camp and fly-camps site setups and operations																
		3.	Widening of tracks by pruning vegetation overgrowth and tracks levelling as may be applicable																
		4.	Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access for the 2025 2D/3D seismic survey Area.														
		5.	Actual survey operation (data acquisition).																
		6.	Demobilisation and closure (Survey Completion)																
	UNPLANNED ACCIDENTAL EVENTS	7.	Any accidental event that may be associated with the routine and physical presence operational activities																

Table 2.7: KBSMM assessment matrix used for assessing the likely overall significant impacts with respect to proposed 2024 and 2025 2D/3D seismic survey activities on the receiving environment (physical, biological, socioeconomic, cultural, and archaeological environments).

IMPACT SEVERITY (Magnitude, Duration, Extent, Probability)	RECEPTOR CHARACTERISTICS (SENSITIVITY)				
	Very High (5)	High(4)	Medium (3)	Low (2)	Negligible (1)
Very High (5)	Major [5/5]	Major [4/5]	Moderate [3/5]	Moderate [2 /5]	Minor 1/5
High (4)	Major [5/4]	Major [4/4]	Moderate [3/4]	Moderate [2/4]	Minor[1/4]
Medium (3)	Major [5/3]	Moderate[4/3]	Moderate[3/3]	Minor[2/3]	None[1/3]
Low (2)	Moderate [5/2]	Moderate[4/2]	Minor[3/2]	None[2/2]	None[1/2]
Negligible (1)	Minor [5/1]	Minor [4/1]	None [3/1]	None [2/1]	None [1/1]

				PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL, AND ARCHAEOLOGICAL ENVIRONMENT				
				Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional, and national socioeconomic settings	Subsistence Agriculture	Community Forest	Tourism and Recreation	Cultural, Biological and Archaeological Resources
SOURCES OF POTENTIAL IMPACT	**ROUTINE AND PHYSICAL PRESENCE OPERATIONAL ACTIVITIES**	1.	Planning and mobilisation (Pre-survey preparation, field scouting and mapping of buffers and offsets along proposed survey lines)																
		2.	Base camp and fly-camps site setups and operations																
		3.	Widening of tracks by pruning vegetation overgrowth and tracks levelling as may be applicable																
		4.	Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access for the 2025 2D/3D seismic survey Area.															
		5.	Actual survey operation (data acquisition).																
		6.	Demobilisation and closure (Survey Completion)																
	UNPLANNED ACCIDENTAL EVENTS	7.	Any accidental event that may be associated with the routine and physical presence operational activities																

2.4.8 Results of the Likely Positive Impacts

Based on the results of the EIA report, the following is the summary of the key positive impacts that the proposed 2024 and 2025 2D/3D seismic survey will have with mitigation measures provided in this EMP Report:

1. Payment of the annual license rental fees to the Central Government averaging N$ 2 million per year and this is vital revenue streams for the State paid by all petroleum exploration companies in Namibia and for the benefit of all Namibians.

2. An average of USD 50, 000.00 annual contributions to the Petroleum Training and Education Fund (PETROFUND) paid by all petroleum exploration companies in Namibia. The PetroFund provides local, regional and international bursaries and scholarships to seventy (70) Namibians annually.

3. Expansion of the subsurface knowledge-base: The seismic survey data to be generated will be highly useful in the search for other subsurface resources such as minerals, water, geothermal and general geoscience research, and development.

4. Contribution to the development of local infrastructures such as rural water supply through Corporate Social Responsibility (CSR) that the Proponent is currently supporting in Kavango East and West Regions. A total of twenty-two (22) drilled rural water supply boreholes, solar powered and handed-over to the local communities with an additional ten (10) new community water boreholes planned by REN as part of the Corporate Social Responsibility and ESG programmes and being implemented in Kavango West and East Region in line with the Ministry of Agriculture, Water and Land Reform (MAWLR) rural water supply programme.

5. The pruning and opening-up of some of the inaccessible sections of the tracks and roads and implementation of the actual survey operations will provide temporary employment opportunities for the local people for periods of between 3-4 months.

6. The pruning and opening-up of some of the inaccessible sections of the tracks and roads to be used for the proposed 2024 and 2025 2D/3D seismic survey operations will improve access for the local communities.

7. The pruning and levelling of the tracks and roads for the survey lines running along existing tracks oriented in the north-south and east west directions along the boundaries of the large-scale agricultural commercial farming units on communal land will improve access to the large-scale agricultural commercial farming units on communal land and greatly benefit the local farmers in their quest to reach markets for their livestock and produce, and.

8. Although forestry fire kills diseases and insects that prey on trees and keeps the forest healthy and provides valuable nutrients that enrich the soils, uncontrolled wildfires are enormously destructive to the rural livelihoods, the cutting new survey cutlines that could also be used as firebreak where applicable within the general area and Community Forests of Ncaute, and Gcwatjinga is a vital part of the local community forests management strategies that will prevent uncontrolled wildfires and will protect the natural resources base of the local people. Such natural resources base includes: Wild fruits, timber, firewood, building logs, thatch grass, crop fields and crop production as well as pasture and livestock production areas. However, the integration of fire management in community forest and large-scale agricultural commercial farming units on communal land shall take into consideration concerns, priorities and existing knowledge and practices of the local people.

2.4.9 Results of the Likely Negative Positive Impacts

2.3.9.1 Summary Overview

Based on the findings of the EIA Process, the following is the summary of the key likely negative environmental impacts that the proposed 2024 and 2025 2D/3D seismic survey operations may have on the receiving environment with mitigation measures provided in this EMP Report:

1. Disruption / disturbance of the habitats.
2. Reptiles.
3. Amphibian.
4. Mammals.
5. Avian.
6. Tree and shrub species.
7. Grass.
8. Socioeconomic environment.
9. Existing infrastructure, current and future land uses.
10. Ecosystem functions, services, use values and non-use or passive use.
11. Physiography and geology.
12. Visual and land degradation.
13. Surface and groundwater quality.
14. Increased water consumption / depletion of water resources.
15. Existing local community water supply infrastructure along the proposed survey lines (existing roads and tracks).
16. Community and workers security, public safety, Occupational Health, and Safety.
17. Noise and vibrations.
18. Dust and air quality.
19. Waste (solid and liquid) management.
20. Accidental events.
21. Archaeological, paleontological, and historical resources.
22. Contributions to global Climate Change, and.
23. Cumulative impacts.

The above list of receptors of the receiving environment likely to be negatively impacted by the activities of the proposed 2024 and 2025 2D/3D seismic survey operations in PEL 73 have been evaluated during the EIA process of preparing the EIA Report with mitigation measures for significant negative impacts provided in this EMP Report.

2.4.9.2 Impact Assessment Results of the Overall Individual Components

The overall impact assessment of the individual components of the receiving environment covered the magnitude, duration, extent, and probability of the potential impacts due to the proposed 2024 and 2025 2D/3D seismic survey activities interacting with the various components of the receiving environment as presented in the form of a matrix table shown in Table 2.8. The overall assessment is based on the grading of the characterised impact assessment results of the individual positive and negative components of the receiving environment as shown in the EIA Report Chapter 6, Tables 6.1-34, respectively.

The overall severity of potential environmental impacts of the proposed 2024 and 2025 2D/3D seismic survey activities on the receiving environment will be of low magnitude, temporally duration, localised extent, and low probability of occurrence due to the limited scope of the proposed activities and the use of step progression approach in advancing exploration process with each major step requiring a new environmental assessment process.

The standard resources step by step approach to exploration represented by the proposed 2024 and 2025 2D/3D seismic survey operations will allow the Proponent to continuously review and update the various components of the receiving environment as may be applicable against the results of the exploration success. The implementation of the subsequent stage/s of exploration will be subject to the positive outcomes of previous exploration efforts.

2.4.9.3 Assessment Results of the Overall Significant Impacts

The results of the overall significant impacts depended upon the degree to which the proposed 2024 and 2025 2D/3D seismic survey activities are likely to result in unwanted consequences on the receptors. Overall, the assessment of significant impacts has focused on the ecosystem-based approach that considers potential impacts to the overall ecosystem. The main key sources of impacts that have been used in the determination of significant impacts are all the activities associated with the proposed 2024 and 2025 2D/3D seismic survey operations covering the following key areas:

- Positive impacts are classified under a single category; they are then evaluated qualitatively with a view to their enhancement, if practical.

- Negligible or low impacts will require little or no additional management or mitigation measures (on the basis that the magnitude of the impact is sufficiently small, or that the receptor is of low sensitivity), and.

- Medium or high impacts require the adoption of management or mitigation measures to limit or reduce the impact to an acceptable level.

Overall, the results of the significant impacts assessment summary for the proposed 2024 and 2025 2D/3D seismic survey are shown in Table 2.9 and based on the results of detailed assessments presented in the EIA Report Tables 6.1-6.34. It is important to note that the assessment of the likely impacts as shown in Tables 6.1-6.34 in the EIA Report, have been considered without the implementation of mitigation measures detailed in this EMP Report.

The need for implementation of the appropriate mitigation measures as presented in this EMP Report have been determined based on the significance of the identified impacts as detailed in the EIA Report Tables 6.1-6.35 and the results of the significant impacts summary are provided in Table 2.9.

2.4.10 Summary of the EIA Conclusions

The findings of the EIA Report concluded that, all human induced activities including the current land uses such as subsistence agriculture, animal husbandry, natural resource harvesting, conservation, and tourism and the proposed 2024 and 2025 2D/3D seismic survey operations, have the potential to cause negative consequences on the receiving physical, biological, socioeconomic, cultural, and archaeological environments.

By identifying the most important sensitivity components of the receiving environment including high risk habitats beforehand, coupled with environmentally acceptable recommendations (mitigating measures as detailed in this EMP), the overall negative impacts are likely to be minimised, while the positive impacts may be enhanced. The following is the summary of the identified positive and negative components of the receiving environment as evaluated and assessed in the EIA Report with respect to the proposed 2024 and 2025 2D/3D seismic survey operations:

(i) Likely positive impacts: Annual payment of the annual license rental fees to the Central Government, annual contributions to the Petroleum Training and Education Fund (PETROFUND) providing local, regional, and international bursaries and scholarships to about seventy (70) Namibians annually, expansion of the subsurface knowledge-base, contribution to the development of local infrastructures such as rural water supply through Corporate Social Responsibility (CSR) with a total of thirty-six (36) rural water supply boreholes, solar powered and handed-over to the local communities in both Kavango East and West Regions, provisions of temporary employment opportunities to the local people for periods of between 1-3 months, improve access for the local communities through pruning of inaccessible tracks, the pruning and levelling of the tracks and roads for the survey lines running along existing tracks oriented in the north-south and east west directions along the boundaries of the large-scale agricultural commercial farming units on communal land will improve access to the large-scale agricultural commercial farming units on communal land and greatly benefit the local farmers in their quest to reach markets for their livestock and produce, and the cutting of the new survey cutlines that may also be used as firebreak cut lines within the general areas and Community Forests of Ncaute, and Gcwatjinga will prevent uncontrolled wildfires and protect the natural resources base of the local people such as wild fruits, timber, firewood, building logs, thatch grass, crop fields and crop production as well as pasture and livestock production areas, and.

(ii) Receptors likely to be negatively impacted especially during the creation of the new survey cutlines, other line extensions and vegetation pruning processes: Habitats, reptiles, amphibians, mammals, avian, tree, shrub species, grass, socioeconomic, existing infrastructure, current and future land uses, ecosystem functions, services, use values and non-use or passive use, physiography and geology, visual and land degradation, surface and groundwater quality, increased water consumption / depletion of water resources, existing local community water supply infrastructure along the proposed survey lines (existing roads and tracks), community and workers security, public safety, Occupational Health, and Safety, noise and vibrations, dust and air quality, waste (solid and liquid) management, accidental events, archaeological, paleontological, and historical resources, contributions to global Climate Change, and cumulative impacts.

Based on the findings of the EIA Report, this EMP Report has been prepared detailing the mitigation measures that the Proponent shall implement in minimising and maximising the likely negative and positive impacts respectively, that the proposed project activities may have on the receiving environment.

Table 2.8: Summary results of the overall likely impacts of the proposed 2024 and 2025 2D/3D seismic survey activities on the individual components of the receiving environment with respect to duration, geographical extent, and probability occurrence.

RECEIVING ENVIRONMENT SENSITIVITY

SENSITIVITY RATING		CRITERIA
1	Negligible	The receptor or resource is resistant to change or is of little environmental value.
2	Low	The receptor or resource is tolerant of change without detriment to its character, is of low environmental or social value, or is of local importance.
3	Medium	The receptor or resource has low capacity to absorb change without fundamentally altering its present character, is of high environmental or social value, or is of national importance
4	High	The receptor or resource has moderate capacity to absorb change without significantly altering its present character, has some environmental or social value, or is of district/regional importance.
5	Very High	The receptor or resource has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental or social value, or is of international importance.

				PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL, AND ARCHAEOLOGICAL ENVIRONMENT				
				Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional, and national socioeconomic settings	Subsistence Agriculture	Community forest	Tourism and Recreation	Cultural, Biological and Archaeological Resources
SOURCES OF POTENTIAL IMPACT	**ROUTINE AND PHYSICAL PRESENCE OPERATIONAL ACTIVITIES**	1.	Planning and mobilisation (Pre-survey preparation, field scouting and mapping of buffers and offsets along proposed survey lines)	2	2	2	2	2	1	2	1	2	2	2	2	2	2	1	1
		2.	Base camp and fly-camps site setups and operations	2	2	2	2	2	1	2	1	2	2	2	2	2	2	1	1
		3.	Widening of tracks by pruning vegetation overgrowth and tracks levelling as may be applicable	2	2	2	2	2	1	2	1	3	2	2	2	2	2	1	1
		4.	Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access for the 2025 2D/3D seismic survey Area.	2	2	2	2	2	1	3	3	3	2	2	2	2	2	1	1
		5.	Actual survey operation (data acquisition).	2	2	2	2	2	1	2	1	2	2	2	2	2	2	1	1
		6.	Demobilisation and closure (Survey Completion)	2	2	2	2	2	1	2	1	2	2	2	2	2	2	1	1
	UNPLANNED ACCIDENTAL EVENTS	7.	Any accidental event that may be associated with the routine and physical presence operational activities	2	2	2	2	2	1	2	1	2	2	2	2	2	2	1	1

Table 2.9: Summary results of the overall likely significant impacts that the proposed 2024 and 2025 2D/3D seismic survey activities will have on the components of the receiving environment with respect to duration, geographical extent, and probability occurrence.

IMPACT SEVERITY (Magnitude, Duration, Extent, Probability)	RECEPTOR CHARACTERISTICS (SENSITIVITY)				
	Very High (5)	High(4)	Medium (3)	Low (2)	Negligible (1)
Very High (5)	Major [5/5]	Major [4/5]	Moderate [3/5]	Moderate [2 /5]	Minor 1/5
High (4)	Major [5/4]	Major [4/4]	Moderate [3/4]	Moderate [2/4]	Minor[1/4]
Medium (3)	Major [5/3]	Moderate[4/3]	Moderate[3/3]	Minor[2/3]	None[1/3]
Low (2)	Moderate [5/2]	Moderate[4/2]	Minor[3/2]	None[2/2]	None[1/2]
Negligible (1)	Minor [5/1]	Minor [4/1]	None [3/1]	None [2/1]	None [1/1]

				PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL, AND ARCHAEOLOGICAL ENVIRONMENT				
				Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional, and national socioeconomic settings	Subsistence Agriculture	Community forest	Tourism and Recreation	Cultural, Biological and Archaeological Resources
SOURCES OF POTENTIAL IMPACT	ROUTINE AND PHYSICAL PRESENCE OPERATIONAL ACTIVITIES	1.	Planning and mobilisation (Pre-survey preparation, field scouting and mapping of buffers and offsets along proposed survey lines)	2/2	2/2	2/2	2/2	2/2	1/2	2/2	1/2	2/2	2/2	2/2	2/2	2/2	2/2	1/2	1/2
		2.	Base camp and fly-camps site setups and operations	2/2	2/2	2/2	2/2	2/2	1/2	2/2	1/2	2/2	2/2	2/2	2/2	2/2	2/2	1/2	1/2
		3.	Widening of tracks by pruning vegetation overgrowth and tracks levelling as may be applicable	2/2	2/2	2/2	2/2	2/2	1/2	2/2	1/2	3/2	2/2	2/2	2/2	2/2	2/2	1/2	1/2
		4.	Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access for the 2025 2D/3D seismic survey Area.	2/2	2/2	2/2	2/2	2/2	1/2	2/2	3/2	3/3	2/2	2/2	2/2	2/2	2/2	1/2	1/2
		5.	Actual survey operation (data acquisition).	2/2	2/2	2/2	2/2	2/2	1/2	2/2	1/2	2/2	2/2	2/2	2/2	2/2	2/2	1/2	1/2
		6.	Demobilisation and closure (Survey Completion)	2/2	2/2	2/2	2/2	2/2	1/2	2/2	1/2	2/2	2/2	2/2	2/2	2/2	2/2	1/2	1/2
	UNPLANNED ACCIDENTAL EVENTS	7.	Any accidental event that may be associated with the routine and physical presence operational activities	2/2	2/2	2/2	2/2	2/2	1/2	2/2	1/2	2/2	2/2	2/2	2/2	2/2	2/2	1/2	1/2

2.5 Implementation of EMP

2.5.1 Objectives of this EMP

This updated Environmental Management Plan (EMP) provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts, respectively. This EMP gives commitments including financial and human resources provisions for effective management of the likely environmental liabilities during and after the exploration. Regular assessments and evaluation of the environmental liabilities before, during and after the implementation of the proposed 2D infill seismic survey operations will need to be undertaken and will ensure adequate provision of the necessary resources towards good environmental management and improve local community and stakeholders' relations.

2.5.2 Mitigation Measures Guiding Principles

The following is the summary of the guiding principles with respect to the mitigation measures as presented in the EMP Report in order of preference and in addressing the impacts assessed to have likely significant adverse effects on the receiving environment:

(i) Enhancement, e.g. provision of new habitats or supporting infrastructure such as access for the local community.

(ii) Avoidance, e.g. sensitive design to avoid effects on ecological receptors.

(iii) Reduction, e.g. limitation of effects on receptors through design changes, and.

(iv) Compensation, e.g. community benefits.

2.5.3 Monitoring and Reporting Guiding Principles

The environmental performance monitoring process to be provided for in the EMP shall be undertaken by the Proponent and shall include the preparation of the environmental monitoring reports and reporting thereof, as may be required by the various permits, certificates, consents, or authorisations as granted by the Government.

2.5.4 Supporting Documents

The Contractor who will be undertaking the proposed 2024 and 2025 2D/3D seismic survey operation will be required to prepare a comprehensive Health, Safety and Environment (HSE) operational standards, manuals, and policies for approval by REN. The following HSE Contractor documentations will be required and will link directly to this EMP framework as well as the sustainability, health, safety, environment, and social governance documentations of the Proponent:

1. Bridging Document.
2. HSE Management Manual.
3. Project HSE Plan.
4. Waste Management Plan.
5. Journey Management Plan.
6. Working with local communities' guideline.
7. Grievance Mechanism, and.
8. Cultural Heritage Procedure.

2.5.5 Roles and Responsibilities

2.5.5.1 Overview

This EMP report identifies the activity groups / environmental elements, the aspects / targets, the indicators, the schedule for implementation and who should be responsible for the management to prevent major negative impacts that the different activities associated with the proposed 2024 and 2025 2D/3D seismic survey may have on the receiving environment (physical, biological, and socioeconomic, cultural, and archaeological).

2.5.5.2 Proponent's Representative (PR) / Project Manager (PM)

The Proponent is to appoint a **Proponent's Representative (PR)** / **Project Manager (PM)** with the following responsibilities with respect to the EMP implementation:

- Act as the site project manager and implementing agent.
- Ensure that the Proponent's responsibilities are executed in compliance with the relevant legislation.
- Ensure that all the necessary environmental authorizations and permits have been obtained.
- Assist the exploration contractor/s in finding environmentally responsible solutions to challenges that may arise.
- Should the PR believe a serious threat to, or impact on the environment may be caused by the exploration activities, he/she may stop work. The Proponent shall be informed of the reasons for the stoppage as soon as possible.
- The PR has the authority to issue fines / contractual penalties / disciplinary proceedings in accordance with the national laws for transgressions of basic conduct rules and/or contravention of this EMP.
- Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the PR can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied.
- Maintain open and direct lines of communication between the landowners and Proponent, as well as any other identified Interested and Affected Parties (I&APs) with regards to environmental matters, and.
- Attend regular site meetings and inspections as may be required for the proposed exploration programme.

2.5.5.3 ESG/ Environmental Manager/Project HSE Coordinator

The Proponent is to appoint an Environmental Social Governance (ESG) / Environmental Manager/Project Health, Safety and Environment (HSE) Coordinator with the following responsibilities with respect to the EMP implementation:

- Assist the PR in ensuring that the necessary environmental authorisations and permits have been obtained, implemented and monitored.
- Assist the PR and Contractor in finding environmentally responsible solutions to challenges that may arise.
- Conduct environmental monitoring as per EMP requirements.

- ❖ Carry out regular site inspections (on average once per week) of all exploration areas with regards to compliance with the EMP Report and report any non-compliance(s) to the PR as soon as possible.

- ❖ Organise for an independent internal audit on the implementation of and compliance to the EMP to be carried out half way through each field-based exploration activity.

- ❖ Prepare ESG, environmental monitoring, and audit reports as may be applicable to be submitted to the PR.

- ❖ Continuously review the EMP and recommend additions and/or changes to the EMP document.

- ❖ Monitor the Contractor's environmental compliances and awareness training for all new personnel coming onto site.

- ❖ Participate in community engagement meetings organised and undertaken by the Community Liaison Officer (CLOs).

- ❖ Keep records of all activities related to environmental control and monitoring. The latter to include a coordinates, maps and photographic record of the exploration activities, rehabilitation process, and a register of all major incidents, and.

- ❖ Attend regular site meetings.

2.5.5.4 Wildlife Monitoring Experts (WLME)

- ❖ Assist the ESG/ Environmental Manager/Project HSE Coordinator all issues related to the implementation of the EMP with respect to wildlife monitoring requirements of this EMP.

- ❖ Develop a wildlife monitoring plan as a preventative action linked to the EMP.

- ❖ Collect information / monitor on the sensitive habitats, wildlife spatial distribution ranges and with respect to the proposed exploration activities by the Proponent linked to the EMP requirements for knowledge-based decisions making and stakeholder consensus on different interests / matters related to wildlife influences within the exploration area.

- ❖ Attend stakeholders and community meetings organised for the purpose of developing and enhancing the importance of the EMP and presence of the Proponent in the community and serving as a liaison between external Contractors and the local communities on all matters related to wildlife monitoring and human wildlife conflicts linked to the EMP.

- ❖ Participate in all matters related to the implementation and monitoring of the EMP as may be requested by the ESG/ Environmental Manager/Project HSE Coordinator, Contractors, Subcontractors and Other Experts, MEFT, Community Management Committee Members and local Farmers, and.

- ❖ Keep records of all activities related to wildlife monitoring including coordinates of the wildlife sightings, maps, and photographic records.

2.5.5.5 Community Liaison Officers (CLOs)

- ❖ Assist the ESG/ Environmental Manager/Project HSE Coordinator and WLME all issues related to the implementation of the EMP on the ground, visibility of the Proponent and linkages to the local communities.

- Acts as advisor to the ESG/ Environmental Manager/Project HSE Coordinator on all matters relating to assigned areas of responsibility for the purpose of providing information to meet EMP goals and objectives

- Attends community meetings organised for the purpose of developing and enhancing the activities and presence of the Proponent in the community and serving as a liaison between external Contractors and the local communities.

- Collaborates with internal (ESG/ Environmental Manager/Project HSE Coordinator) and external Contractors for the purpose of building effective communication, enhancing relationships, community relations.

- Recommends responses and EMP action plans as a result of interacting with the Contractors, and the local communities in ensuring effective communication practices to meet the EMP strategic goals and objectives.

- Develops, plans, and/or coordinates various system-wide EMP related activities such as community outreach as directed supervisor for the purpose of enhancing community relationships and overall positive public image of the Proponent, and.

- Participate in all matters related to the implementation and monitoring of the EMP as may be requested by the ESG/ Environmental Manager/Project HSE Coordinator.

- Keep records of all sites, communities and stakeholders' records, maps, meetings and engagements minutes including coordinates of the locations, maps, and photographic and nay associated descriptive records.

2.5.5.6 Contractors, Subcontractors and Other Experts

The responsibilities of the **Contractors, Subcontractors and Other Experts** that may be appointed by the Proponent to undertake certain field-based activities of the proposed 2024 and 2025 2D/3D seismic survey operations include:

- Comply with the relevant legislation and the EMP provision.

- Preparation and submission to the Proponent through the Project HSE of the following Management Plans:

    - Environmental Awareness Training and Inductions.

    - Emergency Preparedness and Response.

    - Waste Management, and.

    - Health and Safety.

- Ensure adequate environmental awareness training for senior site personnel.

- Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement. the Project HSE is to provide the course content and the following topics, at least but not limited to, should be covered:

    - The importance of complying with the EMP provisions.

    - Roles and Responsibilities, including emergency preparedness.

    - Basic Rules of Conduct (Do's and Don'ts).

- EMP: aspects, impacts and mitigation.
- Fines for Failure to Adhere to the EMP, and.
- Health and Safety Requirements.

❖ Record keeping of all environmental awareness training and induction presentations, and.

❖ Attend regular site meetings and environmental inspections.

2.5.5.7 MEFT, Community Management Committee/Associations and Land Owner

Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access especially for the 2025 2D/3D seismic survey, will need to be strictly managed and monitored.

Although forest fire kills diseases and insects that prey on trees and keeps the forest healthy and provides valuable nutrients that enrich the soils, uncontrolled wildfires can also be enormously destructive to the rural livelihoods.

Firebreaks are vital part of community forest management strategies that prevents uncontrolled wildfires and will protect the natural resource base of the rural communities in Kavango West and East Regions. Such natural resource base likely to be protected include: Wild fruits, timber, firewood, building logs, thatch grass, crop fields and crop production as well as pasture and livestock production areas.

However, the integration of any firebreak cutlines requests as one of the fire management strategies in the community forests Ncaute, or Gcwatjinga, and in the large-scale agricultural commercial farming units on communal land shall take into consideration the concerns, priorities and existing knowledge and practices of the local people.

The Proponent, Contractor, MEFT, Community Forest Management Committee Members, Conservancy Management Committee Members and local communal farmers shall all be fully be involved in the selection and creation of any firebreak cutlines that can also be used as survey lines, thereof.

3. SPECIFIC MITIGATION MEASURES

3.1 Hierarchy of Mitigation Measures Implementation

A hierarchy of methods for mitigating significant adverse effects has been adopted in order of preference and as follows:

Enhancement, e.g., provision of new habitats.

Avoidance, e.g. sensitive design to avoid effects on ecological receptors.

Reduction, e.g. limitation of effects on receptors through design changes, and.

Compensation, e.g. community benefits.

3.2 Survey Setback Distances / Exclusion Zones (Buffers)

Namibia does not have specific regulations or guidelines on setback distances from specified infrastructures or sensitive environment with respect to onshore seismic survey operations. As international operator, REN has adopted the Alberta Government of Canada Distance Requirements Exploration Directive 2006-15 as shown in Table 3.1 as well as additional guidelines as provided by the International Association of Geophysical Contractors (IAGC).

The setback distances as shown in Table 3.1 were used for the completed Phase I 2D seismic survey with examples of the pre-survey field-based mapped setback distances shown Fig. 3.1. The setback distance guidelines as shown in Table 3.1 will be used for the proposed 2024 and 2025 2D/3D seismic survey with respect to the non-explosive column guidance shown in red because the Proponent is going to use the Explorer 860 as the energy source.

In addition to the setback distances as shown in Table 3.1, the precautionary principles / approaches shall always be exercised especially in situations where specific mitigations, regulatory guidelines, standards, or appropriate setback distances (exclusion zones) around mud houses or sensitive local cultural resources such as burial or cultural sites have not been provided.

Local communities shall always be consulted on matters related to sensitive local cultural resources not provided for in the international guidelines / standards.

3.3 Creation of New Cutlines

MEFT, Community Forest Management Committee Members, Conservancy Management Committee Members and local communal farmers shall all be fully involved in creation of new cutlines for the 2025 2D/3D seismic survey operations. In the event that there is a formal request to create firebreak cut lines and use it as a once-off survey lines thereof, such cut lines shall be created as required by MEFT specifications.

The Proponent shall not be involved in the physical creation of a firebreak in the community forest of Ncaute, or Gcwatjinga, and in the large-scale agricultural commercial farming units on communal land, this task shall be left to a contractor to be supervised by and overseen by MEFT Community Forest Management Committee Members, Conservancy Management Committee Members, and local communal farmers. The Proponent shall only provide the financial resources to cover the costs of the Contractor if such resources are available.

Table 3.1: Red column setback distances to specified structures to be applied and used for the proposed 2024 and 2025 2D/3D seismic survey operations (Source: Distance Requirements Exploration Directive 2006-15, Alberta Government, Canada).

Table of Required Setback Distances to Specified Structures	Explosive		Non-Explosive
Specified Structure	**Charge Size**	**Distance**	**Distance**
Residence, barn, or any building(s) with a concrete base, concrete irrigation structures (e.g., drop structures, head works); concrete lined irrigation canals, and concrete water pipelines.	Up to and including 12 kg	180 m	50 m
	> 12 kg < = 20	200 m	
Water wells, developed spring, observation well, or piezometer.	Up to and including 12 kg	180 m	100 m
	> 12 kg < = 20	200 m	
High Pressure Pipelines High pressure pipelines are pipelines that operate at, or are intended to operate at a pressure in excess of 700 kilo pascals or less. **Note:** All distances are measured from the centre of the pipeline.	< = 2 kg	32 m	15 m
	> 2 & < 4 kg	45 m	
	> = 4 & < 6 kg	55m	
	> = 6 & < 8 kg	64 m	
	> = 8 kg & < 10 kg	70 m	
	> = 10 & < 12 kg	78 m	
	> = 12 kg < = 20 kg	100 m	
Low Pressure Pipelines Low pressure pipelines are pipelines that operate at, or are intended to operate at a pressure of 700 kilo pascals or less. **Note:** All distances are measured from the centre of the pipeline.	Up to and including 20 kg	3 m	3 m
Dugouts Measured from the inside edge of high water mark.		50 m	25 m
Irrigation Canal (other than concrete lined) Irrigation canals that are more than 4 m wide.		10 m	10 m
Buried Water Pipelines (other than concrete lined)		3 m	3 m
Dams Dam means a barrier constructed and having a storage reservoir capacity of at least 30,000 m^3, and which is at least 2.5 m in height when measured vertically to the top of the barrier.		180 m	50 m
Cemetery Distance to the energy source is measured to the surveyed boundary of the cemetery.		100 m	50 m
Buried Lines and Survey Monuments Telephone lines and telecommunications lines.		2 m	2 m
Domestic Septic Tank or Mound A septic tank is defined as a tank that is used as septic storage device. A mound is a septic storage device that is located above ground surface.		15 m	15 m

Table of Reduced Setback Distance to Specified Structures with Written Consent of the Owner of the Structures	Explosive		Non-Explosive
Specified Structure	**Charge Size**	**Distance**	**Distance**
Residence, barn, or any building(s) with a concrete base, concrete irrigation structure (e.g., drop structures, head works), concrete-lined irrigation canals, and concrete water pipelines. Water wells, developed springs, observation wells, or piezometer.	< = 2 kg	64 m	50 m
	> 2 & 4 kg	90 m	
	> = 4 & < 6 kg	110 m	
	> = 6 & < 8 kg	128 m	
	> = 8 & < 10 kg	142 m	
	> = 10 & 12 kg	156 m	

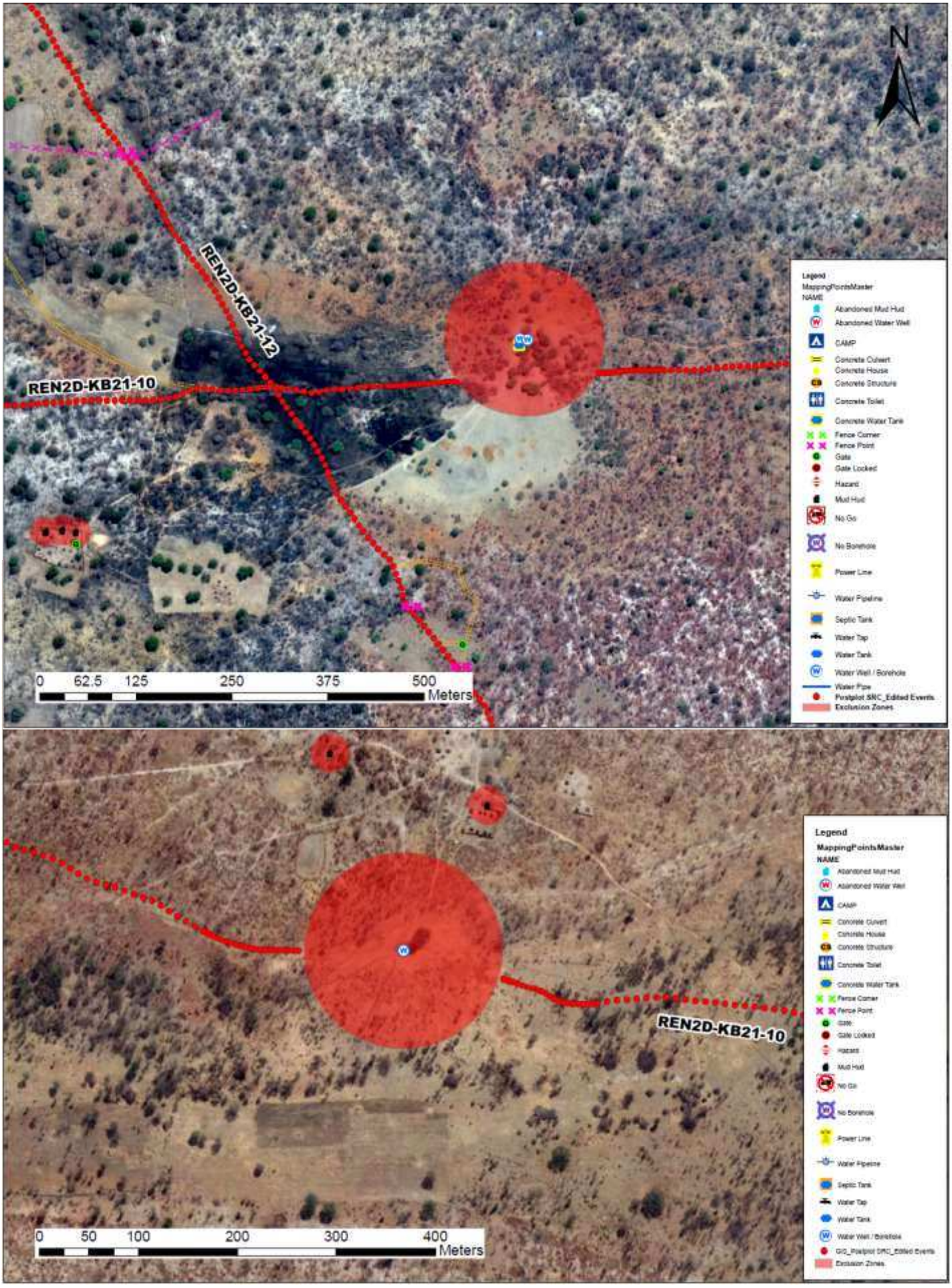


Figure 3.1: Example of the pre-survey field-mapped setback distances / buffer zones used for the Phase I 2D seismic survey operations (Source: REN, 2021).

3.4 Specific Mitigation Measures

Based on the findings of the impact assessment process as described in the EIA Report, Table 3.2–3.25 provides the detailed specific mitigation measures to be implemented by the Proponent with respect to the proposed 2024 and 2025 2D/3D seismic survey operations. The following is the summary of the key areas of the migration measures provided in Tables 3.2-3.25 with respect to survey area, campsites, layover sites, survey locations and along the survey lines:

1. Project planning and implementation.
2. Implementation of the EMP, roles and responsibilities with resources allocation.
3. Management of public and stakeholder's relations and continuous community engagements.
4. Enhance positive socioeconomic impacts.
5. Environmental awareness briefing and training.
6. Erection of infrastructure for the proposed 2024 and 2025 2D/3D seismic survey operations.
7. Use of existing access roads, tracks, and general vehicle movements with respect to fauna, flora, and habitat protection.
8. Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT around Nacute, and Gcwatjinga Forests and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access for the 2025 2D/3D seismic survey Area.
9. Preventing flora and ecosystem destruction and promotion of conservation.
10. Preventing faunal and ecosystem destruction and promotion of conservation.
11. Preservation of the environment though effective environmental management practices.
12. Protection of surface and groundwater and water supply infrastructure protection.
13. Promotion of effective general water usage.
14. Minimise negative socioeconomic impacts.
15. Minimise negative health and safety impacts.
16. Minimise visual impacts.
17. Management of sites and surrounding traffic and equipment movements.
18. Protection of sensitive receptors through setback distances and the precautionary principles.
19. Equipment / vehicles noise, vibrations, emissions influence on air quality and climate change.
20. Management of dust and influence on air quality / health receiving environment.
21. Spillages and accidental products or fuel leaks.
22. Waste (solid and liquid) management.
23. Rehabilitation plan, and.
24. Environmental performance monitoring and data collection.

Table 3.2: Project planning and implementation.

OBJECTIVE	INDICATOR	SCHEDULE	RESPONSIBILITY
Establish a strong environmental awareness protocol from project implementation to final closure in order to ensure the least possible impact to the receiving environment.	1. Resources (Human and Financial) are provided for the Environmental Awareness and Training, Regular Safety, Health and Environment meetings and for internal and external environmental monitoring costs as well as for any rehabilitation costs that may arise. 2. Appointment of senior and experienced persons as Proponent's Representative (PR), Project Manager (PM) and Project HSE to assume responsibility for environmental issues. 3. All individuals including sub-contractors who work on, or visit, the sites are aware of the contents of the Environmental Policy and the EMP. 4. The EMP and Environmental Policy will be included in Tender Documents. 5. Field visit will take place during which main access tracks will be discussed in cooperation with the land owner/s	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. Project HSE 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.3: Implementation of the EMP, roles and responsibilities with resources allocation.

IMPLEMENTATION STRATEGY	INDICATOR	SCHEDULE	RESPONSIBILITY
1. Define roles and responsibilities in terms of the EMP implementation and monitoring to make sure all personnel, contractors and subcontractors are aware of their roles and responsibilities to ensure compliance with the EMP provisions. 2. Implement environmental management that is preventative and proactive. 3. Establish the resources, skills, etc. required for effective environmental management and monitoring.	1. Senior staff and senior contractors are aware of, EMP provisions and requirements. These persons shall be expected to know and understand the objectives of the EMP and will, by example, encourage suitable environmentally friendly behaviour to be always adopted at the campsites and along the survey lines 2. Recognition will be given to appropriate environmentally acceptable behaviour. 3. Inappropriate behaviour will be corrected. An explanation to why the behaviour is unacceptable shall be given, and, if necessary, the person will be disciplined. e.g., disciplinary procedure initiated for non-compliance	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. Contractor 4. Subcontractors 5. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.4: Management of public and stakeholders' relations and continuous community engagements.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Maintain sound local community relationships and other stakeholders / public / Interested and Affected Parties (I&APs)	1. Prior to the project team going to the field as part of the preparatory, implementation, operation, closure of the proposed 2024 and 2025 2D/3D seismic survey operations, the local community shall be informed through the Governors and local Councillors or traditional leaders. 2. Project implementation updates shall be provided to the Competent Authority (MME) (Petroleum Commissioner), MEFT, Kavango West and East Regional Governors and Councillors as well as Traditional Authority and local community as may be applicable 3. All applicable permits, certifications and concerts shall be obtained before project implementations.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor and Subcontractors 5. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.5: Enhance positive socioeconomic impacts.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Effective management of socioeconomic benefits of the proposed project activities with direct links to ESG and Corporate Social Responsibility (CSR)	1. Proponent continues to pay license rental fees and contributions to the PeteoFund as well as delivering on CSR especially on rural water supply for the local communities 2. Stipulate a preference for local contractors in its tender policy. Preference to local contractors should be based on competitive business principles and salaries and payment to local service providers should still be competitive. 3. Develop a database of local businesses that qualify as potential service providers and invite them to the tender process. 4. Stipulate that resident from the villages along the survey lines should be employed for temporary unskilled/skilled positions and where possible in permanent unskilled/skilled positions as they would reinvest in the local economy. 5. Must ensure that potential employees are from the area by recruiting with the help of the traditional authority 6. Must ensure that contractors adhere to Namibian Affirmative Action, Labour and Social Security, Health and Safety laws. This could be accomplished with a contractual requirement stipulating that monthly proof should be submitted indicating payment of minimum wages to workers, against their ID numbers, payment of social security and submission of affirmative action data.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.6: Environmental awareness briefing and training.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Promote effective environmental management through environmental awareness at the campsite and along the survey lines	1. Conduct regular environmental awareness debriefing and training to all the camp site and field survey workers. 2. All visitors to the campsite or along the survey lines shall always be given environmental awareness debriefing 3. Every senior/supervisory member of the team shall familiarise themselves with the contents of the EMP. They shall understand their roles and responsibilities regarding personnel and project compliance with the EMP. 4. Subject to agreement of the parties, the Environmental Coordinator will hold an Environmental Awareness Briefing meeting, which shall be attended by all contractors before the start of the proposed 2024 and 2025 2D/3D seismic survey operations. 5. Briefings on the EMP and Environmental Policy shall discuss the potential dangers to the environment of the following activities: public relations, littering, off-road driving, waste management, poaching and plant theft etc. The need to preserve soil, conserve water and implement water saving measures shall be presented.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.7: Creation of infrastructure to support the proposed 2024 and 2025 2D/3D seismic survey.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
All proposed 2024 and 2025 2D/3D seismic survey operations supporting infrastructure such as the camp site and other infrastructure as may be required along the survey lines to be installed in harmony with the receiving environment	1. Adhere to the conditions of the Environmental Clearance Certificate (ECC) and any other additional permits 2. Obtain consent from the local land owner / surface rights holder/s 3. Always develop structures on already disturbed areas and with least disturbance to the environment and within the non-sensitive areas such as unused cleared fields for campsite and old tracks and wide paths for survey lines / tracks extensions 4. All on site exploration infrastructure (e.g. water tanks, sewage tanks, waste disposal) chemical toilets along survey lines are not situated on environmental sensitive area. 5. Put-up no littering signage around the campsites or along the survey lines	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.8: Use of existing access roads, tracks, and general vehicle movements with respect to fauna, flora, and habitat protection.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Promote effective management of the receiving environment especially the habitats, fauna, flora, and overall ecosystem	1. Avoid unnecessarily affecting areas viewed as important habitat – i.e. Omuramba Omatako and its various tributaries, pans, clumps of protected tree species 2. Avoid placing tracks/roads through sensitive areas – e.g. along ephemeral drainage lines and pans. Use existing access routes. This would minimise the effect on localised potentially sensitive habitats/fauna in the area. 3. Avoid felling protected tree species (especially large specimens and indigenous fruit trees – i.e. follow a meandering approach which avoids such species rather than straight lines). Avoid dead trees (habitat to a variety of cavity dwellers – e.g. bats, geckos, hornbills, red-billed oxpeckers, etc.). Avoid ephemeral pan areas. Avoid vehicle activity within the ephemeral drainage lines, etc. as much as possible. 4. Prune overhanging branches that may affect vehicle access, rather than removing the entire tree, especially for protected and fruit tree species. 5. Avoid driving randomly through the area (i.e. "track discipline"), but rather stick to permanently placed tracks/roads. This would minimise the effect on localised potentially sensitive habitats/fauna in the area. 6. Stick to speed limits of maximum 30km/h as this would result in fewer faunal road mortalities. Lower speeds would also minimise dust pollution. 7. Implement erosion control. – I.e. avoid constructing tracks within ephemeral drainage lines and pans. Incorporate erosion furrows (runoff sites) and humps along tracks to channel water off the tracks to minimise erosion problems. Cross drainage lines at right angles, etc. The area(s) towards & adjacent the drainage line(s) are easily eroded and further development may exacerbate this problem. Avoid construction within 100m of the main drainage line(s) to minimise erosion problems as well as preserving the riparian associated flora and fauna. 8. Use of "3-point-turns" rather than "U-turns". 9. Where tracks have to be made to potential exploration sites off the main routes, the routes should be selected causing minimal damage to the environment – e.g. use the same tracks. Cross drainage lines at right angles. Avoid placing tracks within drainage lines. Avoid collateral damage (i.e. select routes that do not require the unnecessary removal of trees/shrubs, especially protected species). 10. Before any trees or vegetation are removed protected species shall be identified and must not be removed. 11. Removal of protected flora will require permission form the Department of Forestry in the Ministry of Environment, Forestry and Tourism 12. Leave vehicles on tracks and walk to point of interest, when possible. 13. Rehabilitate all new tracks created.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.9: Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access for the 2025 2D/3D seismic survey Area.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT/ Land Owner	1. Limit the development to actual cutline surveyed areas to be cleared and avoid affecting adjacent areas. 2. Do not remove unique and sensitive flora (e.g., Baikiaea plurijuga (Zambezi teak), Burkea africana (burkea), Guibourtia coleosperma (false mopane), Pterocarpus angolensis (kiaat), Schinziophyton rautanenii (manketti) and Strychnos species (monkey orange spp.). 3. Prevent and discourage the collecting of firewood as dead wood has an important ecological role – especially during the creation of the cut lines. Such collecting of firewood, especially for economic reasons, often leads to abuses – e.g., chopping down of live and/or protected tree species such as Baikiaea plurijuga (Zambezi teak), Burkea africana (burkea), Guibourtia coleosperma (false mopane), Pterocarpus angolensis (kiaat), Schinziophyton rautanenii (manketti) and Strychnos species (monkey orange spp.). 4. Attempt to avoid the removal of any bigger trees even if they are not part of the protected species during the new cutline clearing phase(s) as these serve as habitat for a myriad of fauna. 5. Prevent and discourage fires – especially during the new cutline clearing phase(s) – as this could easily cause runaway veld fires causing problems (e.g., loss of grazing & domestic stock mortalities, etc.) for the neighbouring communities. 6. Rehabilitation of the disturbed areas – i.e., initial development access route "scars" and associated tracks as well as temporary camp sites. Preferably workers should be transported in/out to the new cutline clearing sites daily to avoid excess damage to the local environment (e.g., fires, wood collection, poaching, etc.). Such rehabilitation would not only confirm the company's environmental integrity, but also show true local commitment to the environment. 7. Eradicate – destroy – all invasive alien plants encountered on site – e.g., *Eucalyptus*, *Opuntia* & *Sisal* spp., etc. This would ensure that the spread is limited and show environmental commitment. 8. Educate/inform contractors and staff on protected species to avoid and the consequences of illegal collection of such species. 9. Investigate the idea of employing an Environmental Officer during the creation of the new survey cutlines to ensure compliance and minimise the overall impact on the flora and the environment. 10. Liaise with MEFT officials responsible for wildlife whilst working close to the Mangetti and Khaudum National Parks.	1. During planning and mobilisation 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of new cutlines / firebreak 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.10: Preventing flora and ecosystem destruction and promotion of conservation.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Prevent flora and ecosystem destruction and promote conservation	Limit the development to actual tracks/roads to be cleared and avoid affecting adjacent areas, especially the Omuramba Omatako and other ephemeral drainage lines and pans, throughout the entire area. Avoid development & associated infrastructure in sensitive areas – e.g. Okavango River. Omuramba Omatako. Other ephemeral drainage lines and pans and undeveloped areas. This would minimise the negative effect on the local environment especially unique features serving as habitat to various flora species. Do not remove unique and sensitive flora (e.g. all *Aloe* spp., etc.) Prevent and discourage the collecting of firewood as dead wood has an important ecological role – especially during the during the track/road building phase(s). Such collecting of firewood, especially for economic reasons, often leads to abuses – e.g. chopping down of live and/or protected tree species such as Baikiaea plurijuga (Zambezi teak), Burkea africana (burkea), Guibourtia coleosperma (false mopane), Pterocarpus angolensis (kiaat), Schinziophyton rautanenii (manketti) and Strychnos species (monkey orange spp.). Do not remove bigger trees during the track/road clearing phase(s) as these serve as habitat for a myriad of fauna. Avoid the destruction of larger trees associated with the ephemeral drainage lines. Prevent and discourage fires – especially during the track/road clearing phase(s) – as this could easily cause runaway veld fires causing problems (e.g. loss of grazing & domestic stock mortalities, etc.) for the neighbouring communities. Rehabilitation of the disturbed areas – i.e. initial development access route "scars" and associated tracks as well as temporary camp sites. Preferably workers should be transported in/out to the track/road clearing sites on a daily basis to avoid excess damage to the local environment (e.g., fires, wood collection, poaching, etc.). Such rehabilitation would not only confirm the company's environmental integrity, but also show true local commitment to the environment. Eradicate – destroy – all invasive alien plants encountered on site – e.g. *Eucalyptus*, *Opuntia* & *Sisal* spp., etc. This would ensure that the spread is limited and show environmental commitment. Educate/inform contractors and staff on protected species to avoid and the consequences of illegal collection of such species. Investigate the idea of employing an Environmental Officer during the track/road building phase(s) to ensure compliance and minimise the overall impact on the flora and the environment. Liaise with MEFT officials whilst working close to the Mangetti and Khaudum NP's.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.11: Preventing faunal and ecosystem destruction and promotion of conservation.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Prevent faunal and ecosystem destruction and promote conservation	1. Limit the development to actual tracks/roads to be cleared and avoid affecting adjacent areas, especially the Omuramba Omatako and other ephemeral drainage lines and pans, throughout the entire area. 2. Avoid development & associated infrastructure in sensitive areas – e.g. Okavango River. Omuramba Omatako. Other ephemeral drainage lines and pans and undeveloped areas. This would minimise the negative effect on the local environment especially unique features serving as habitat to various vertebrate fauna species. 3. Remove (e.g. capture) unique fauna and sensitive fauna (e.g. tortoises, monitor lizard) before commencing with the development activities and/or species serendipitously located during this period and relocate to undisturbed sites in the immediate area. 4. Prevent and discourage the setting of snares (poaching), illegal collecting of veld foods (e.g. tortoises, etc.), indiscriminate killing of perceived dangerous species (e.g. snakes, etc.) and collecting of wood as this would diminish and negatively affect the local fauna – especially during the fieldwork phase(s). 5. Attempt to avoid the removal of bigger trees during the track clearing phase(s) as these serve as habitat for a myriad of fauna. Rather prune branches affecting access only. 6. Prevent and discourage fires – especially during the track clearing phase(s) – as this could easily cause runaway veld fires affecting the local fauna, but also causing problems (e.g. loss of grazing & domestic stock mortalities, etc.) for the neighbouring communities. 7. Rehabilitation of the disturbed areas – i.e. initial development access route "scars" and associated tracks as well as temporary camp sites. Preferably workers should be transported in/out to the track clearing sites on a daily basis to avoid excess damage to the local environment (e.g. fires, wood collection, poaching, etc.). Such rehabilitation would not only confirm the company's environmental integrity, but also show true local commitment to the environment. 8. Prevent domestic pets – e.g. cats & dogs – accompanying the workers during the track clearing phase(s) as cats decimate the local fauna and interbreed & transmit diseases to the indigenous African wildcat found in the area. Dogs often cause problems when bonding on hunting expeditions thus negatively affecting the local fauna. The indiscriminate and wanton killing of the local fauna by such pets should be avoided at all costs. 9. Initiate a suitable waste removal system (i.e. remove to Rundu and not store on site) as this often attracts wildlife – e.g. jackals, crows, etc. – which may result in human-wildlife conflict issues. 10. Educate/inform contractors and staff on protected species to avoid and the consequences of illegal collection of such species. 11. Investigate the idea of employing an Environmental Officer during the track clearing phase(s) to ensure compliance and minimise the overall impact on the fauna and the environment. 12. Liaise with MEFT officials whilst working close to the Mangetti and Khaudum NP's.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.12: Preservation of the receiving environment though effective environmental management practices.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Promotion of conservation and effective environmental management through preservation of the receiving environment around the campsites, temporary layover sites and along each of the survey lines	1. Select camp sites and other temporary layover sites along the survey lines with care – i.e., avoid important habitats (e.g., raptor breeding sites, pans). 2. Use portable chemical toilets or French Drain systems or suitable portable system to avoid faecal pollution at the temporary campsites. 3. Use portable chemical toilets to avoid faecal pollution at temporary layover sites and along each of the proposed 2024 and 2025 2D/3D seismic survey lines. 4. Initiate a suitable and appropriate refuse removal policy at the campsite and along the survey lines as littering could result in certain animals becoming accustomed to humans and associated activity and result in typical problem animal scenarios for the local community and visitors– e.g., baboon, black-backed jackal, crows, etc. 5. Avoid and/or limit the use of unnecessary extremely brighter spot lights at the campsites as this could influence and/or affect various nocturnal species – e.g., bats and owls, etc. Use focused lighting for least effect. 6. Prevent the killing of species viewed as dangerous – e.g., various snakes – when found around the campsites or along the survey lines. 7. Prevent the setting of snares for ungulates (i.e., poaching) or collection of veld foods (e.g., tortoises, monitor lizard) and unique plants (e.g., *Harpagophytum procumbens*) or any form of illegal hunting activities. 8. Avoid introducing dogs and cats as pets to camp sites or along the survey lines as these can cause significant mortalities to local fauna (cats) and even stock losses (dogs). 9. Remove and relocate slow moving vertebrate fauna (e.g., tortoises, chameleon, snakes, etc.) to suitable habitat elsewhere in the general area. 10. Avoid the removal and/or damaging of protected flora potentially occurring in the general area – e.g., various *Baikiaea plurijuga*, *Pterocarpus angolensis*, etc. Removal of protected plants can only be done with permission from the Department of Forestry in the MEFT 11. Avoid introducing ornamental plants, especially potential invasive alien species, as part of the landscaping of the camp sites, etc., but rather use localised indigenous species, should landscaping be attempted, which would also require less maintenance (e.g., water). 12. Remove all invasive alien species wherever encountered – e.g., *Prosopis* spp. This would not only indicate environmental commitment, but actively contribute to a better landscape. 13. Rehabilitate all areas disturbed by the exploration activities – i.e., campsites, tracks and layover sites along the survey lines etc. 14. Ensure that adequate firefighting equipment (e.g., fire beaters. extinguishers, etc.) is available at camp sites, layover sites and along the survey lines to manage any accidental fires. 15. Liaises with MEFT officials whilst working close to the Mangetti and Khaudum National Parks 16. Employ an independent environmental auditor to ensure compliance, especially of the rehabilitation of all the affected areas.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.13: Protection of surface and groundwater and water supply infrastructure protection.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Effective management / protection of surface, groundwater resources and water supply infrastructure	1. Review the groundwater hydro-census baseline data sets prior to the implementation of the proposed survey. Typical groundwater information collected includes rest water levels, pumping regimes, water demand, rates of abstraction and of course water quality. To have greater transparency on the water monitoring activities, the affected landowners / farmers/ local community shall be given access to the results of the water monitoring analyses. 2. Select strategic boreholes for groundwater monitoring network. These boreholes shall be monitored over time to determine the impact of operations surrounding the exploration activities. 3. Limit the operation to a specific site and avoid sensitive areas and in particular the Ephemeral River Channel along the survey lines. This would sacrifice the actual area for other adjacent Ephemeral River areas and thus minimise any likely negative effect on water resources. 4. Disposal of wastewater into any public stream is prohibited. 5. Pits for disposal of domestic and sanitary effluents should be sited with knowledge of the geological and soil characteristics of the area and not too close to the water supply borehole/s 6. Buffer zone between seismic lines and water sources / supply locations shall be established through extensive in-field ground vibration testing in addition to the guidance provided in Table 3.1. Distances may vary between seismic source types, as per International Association of Geophysical. Contractors (IAGC) Guidelines. 7. Spill kits to be carried by service and refuelling vehicles along the survey lines and the survey crew shall be trained and debriefed regularly on the use of spill skits. 8. Ensure that all vehicles and machinery operating in the field (and in the campsite) are properly maintained so as not to have any oil leaks that could contaminate the soils. 9. Ensure that all drivers and technicians are familiar with drip-tray and spill kit use through daily tool-box talks.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.14: Promotion of effective general water usage.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Promote effective use and management of local water resources	1. The Proponent shall obtain permission from the land owner/s / community before utilising any water resources or any associated water infrastructure near the campsites, layover sites or along the survey lines. 2. Always use as little water as possible. 3. Reduce, Reuse and Re-Cycle (3Rs) water where possible. 4. All leaking pipes / taps shall be repaired immediately when they are noticed. 5. Never leave taps running. 6. Close taps after you have finished using them. 7. Immediately report to your Contractor or Environmental Control Officer / Site Manager when you notice overflowing water or unhygienic conditions at the ablution facilities. 8. No washing of vehicles, equipment and machinery, containers, and other surfaces.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.15: Minimise negative socioeconomic impacts.

IMPLEMENTATION STRATEGY	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Manage unrealistic employment expectations, in-flux of job seekers, social friction with local people, increase in crime, protect family structures, reduce Covid-19 and other diseases, and reduce pressure on local resources (land, water etc),	1. Address unrealistic expectations about large number of jobs that would be created before project implementation. 2. Providing information such as the number and types of jobs available 3. The employment of local residents and local companies should be a priority. To ensure that potential employees are from the area through working with the traditional authorities and village headmen/ women / foremen/ ladies. 4. Campsites, layover sites and implementation of the surveys in community tracks should be done after consultation with the land owners and affected local community to avoid any conflicts. 5. When contracts of employees outside the local survey area are terminated or not renewed, contractors should transport the employees out of the local area to their hometowns within two days of their contracts ending. 6. Tender documents could stipulate that contractor have COVID-19 and HIV/AIDS workplace policies and programmes in place and proof of implementation should be submitted with invoicing to the Proponent. 7. Develop strategies in coordination with local health officers and NGO's to protect the local communities, especially young girls. 8. Contract companies could submit a code of conduct, stipulating disciplinary actions where employees are guilty of criminal activities in and around the vicinity of the campsite, layover areas or along the survey lines. Disciplinary actions should be in accordance with Namibian legislation. 9. Contract companies could implement a no-tolerance policy regarding the use of alcohol and workers should submit to a breathalyser test upon reporting for duty daily as may be applicable and especially for all drivers. 10. Ensure that drivers adhere to speed limits and that speed limits are strictly enforced. 11. Ensure that vehicles are road worthy and drivers are qualified. 12. Train drivers in potential safety issues to avoid accidents that may create conflicts with the local communities.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.16: Minimise negative health and safety impacts including the impact of COVID-19.

IMPLEMENTATION STRATEGY	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Promotion of health and safe working environment in line with national Labour, Health and Safety Regulations and international best practices for conducting the Phase II 2D infill seismic survey operations	1. Request the Roads Authority for permission to erect warning signs of heavy/ survey vehicles on affected public roads. 2. An onsite ambulance, qualified medical practitioner and essential medical kits shall always be available around the campsite, layover sites and along the survey lines. 3. Physical hazards: Follow national and international regulatory and guidelines provisions, always make use of correct Personal Proactive Equipment (PPE), training programme, as well as the implementation of Health and Safety Programmes in accordance with the Labour Act. 4. All exploration equipment shall be in good working condition and serviced accordingly. 5. Ensure that all workers can be identified by staff uniform and badges where applicable. 6. Restrict access to the campsites, layover sites and survey locations along the survey lines as may be required. 7. The campsites shall be temporally secured as required and the type of fencing to be used would, however, be dependent on the impact on the visual resources and/or cost. 8. Notice or information boards relating to COVID-19 requirements, public safety hazards and emergency contact details to be put-up at the campsite gate(s) and on key support field vehicles. 9. Rubber gloves and masks always be used in case of an accident to reduce the risk of contracting HIV/AIDS or COVID-19 10. All workers shall be made aware and given instructions concerning the dangers of dehydration or hyperthermia. Encourage all to drink plenty of clean water not directly from the surface water bodies or unknown water wells. 11. No person under the influence of alcohol or drugs shall be allowed at the campsites, layover sites or survey locations along the survey lines. 12. Ensures compliance with the requirements of the relevant Namibian Labour, Health and Safety Regulations always. 13. Dangerous or protected / sensitive areas shall be clearly marked and access to these areas shall be controlled or restricted. 14. Due care shall be taken when driving any vehicles on any roads particularly the gravel roads. ALL Drivers must drive with their headlights switched on when travelling on the gravel roads (day and night). 15. Persons driving a vehicle shall be in possession of a valid driver's license 16. Awareness on HIV/AIDS and COVID-19 among workers is raised	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.17: Minimise visual impacts.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Preserve the landscape character in the development of supporting infrastructure and choice of visual screening	1. Consider the landscape character and the visual impacts of the survey area, campsites, layover sites, survey locations and along the survey lines from all relevant viewing angles, particularly from public roads. 2. Always use the existing roads, tracks, paths, disturbed cleared fields / areas for creation of new access, campsite, or layover sites 3. Always use vegetation screening when selecting a campsites or layover sites along the survey lines. 4. DO NOT cut down vegetation unnecessarily around the survey area, campsites, layover sites, and along the survey lines use it for site screening as may be applicable. 5. Avoid the use of very high fencing around the campsites. 6. Minimise the creation or widening of access roads and no off-road that could result in land scarring. 7. Minimise the presence of secondary structures: remove inoperative support structures. 8. Littering along the survey area, campsites, layover sites, survey locations and along the survey lines is strictly prohibited 9. Remove all infrastructure and reclaim, or rehabilitate and clean the survey area, campsites, layover sites, survey locations and areas along the survey lines on completion of the operations.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.18: Management of sites, surrounding traffic and equipment movements.

ASPECTS	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Management of any likely increase traffic and equipment movements around the survey area, campsites, layover sites, survey locations and along the survey lines	1. All drivers must undergo defensive driving training. 2. Adhere to the site and national public roads speed limits. 3. Adhere to all the Road Authority Road restrictions requirements 4. Adhere to site equipment / vehicles movement procedures and protocols / operational manuals. 5. Ensure safety of traffic movement, trip schedule should be advised for all scheduled heavy-duty vehicles, all drivers should be in possession of valid driver's licence and speed limits should be adhered to. 6. The use of traffic and safety warning signs and flag persons to warn and control traffic should be advised where required. 7. Always drivers and support teams shall be on a lookout for people on roads / tracks, wild animals, domestic animals, and other obstacles such as fallen trees	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.19: Protection of sensitive receptors through setback distances and the precautionary principles / approaches.

ASPECTS	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Protection of sensitive receptors through setback distances and the precautionary principles / approaches	1. Conduct field tests on appropriate setback distances not provided in **Table 3.1** 2. Always apply setback distances as shown in Table 3.1 3. Always apply the precautionary principles in situations where specific mitigations, regulatory guidelines, standards, or appropriate setback distances (exclusion zones) around mud houses or sensitive local cultural resources such as burial or cultural sites have not been provided. 4. Always consult local communities on matters related to sensitive local cultural resources such as burial grounds, sacred trees or sites, as well as all other cultural and traditional norms not provided for in the international guidelines / standards	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractor

Table 3.20: Equipment / vehicles noise, vibrations, emissions influence on air quality and climate change.

ASPECTS	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Minimise the noise, vibrations, and other emissions associated with equipment / vehicles movements	1. All seismic operations should be carried out only during daylight hours. 2. Campsite's delivery of materials and equipment to sites shall be scheduled to avoid pick traffic hours around the public roads to minimise congestion 3. Always adhere to equipment / vehicles noise and other emissions management procedures 4. Adhere to the project buffer zones established for the campsites (500m) from the nearest village and along the survey lines 500m to 1km from the school, clinic or sensitive infrastructure as may be applicable. 5. Equipment / vehicles engines must be well maintained to minimise the noise. 6. At campsite, use silent generators where possible 7. Use noise screens if required 8. Neighbours shall be alerted of operations that are likely to produce excessive noise, vibrations, and other emissions 9. Personal Protective Equipment shall be always use. 10. Clean fuels such as Liquefied Petroleum Gas (LPG) and electric vehicles / equipment should be used. LPG is non-toxic, non-corrosive, and free of tetra-ethyl lead or additives, it burns more cleanly than petrol.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors

Table 3.21: Management of dust and influence on air quality / health receiving environment.

ASPECTS	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Management of any likely site dust that may be generated around the survey area, campsites, layover sites, survey locations and along the survey lines	1. Adhere to the site / public roads and as per Road Authority Road restrictions requirements speed limits. 2. Adhere to the survey operations speed limit of between 30-60km/h 3. Temporary measure: Use high pressure water dust control spray system with manual or automated, high frequency, light watering of materials to prevent dust lift off around the campsite. 4. Workers must always use Personal Protective Clothing / Equipment. 5. If there is excessive dust being generated along a specific survey line with nearby villages / communities or sensitives environment or infrastructure likely to be negatively impacted, the use a water tanker to wet the specific section of road surface may be undertaken	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors

Table 3.22: Spillages and accidental products or fuel leaks.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Contaminant spill management with respect to survey vehicles, trucks, and earthmoving equipment	1. Always adhere to site management procedures to prevent spillages. 2. Ensure that any in-field refuelling or maintenance is performed in a bunded area or while using a drip tray with a spill-kit available. 3. Refuelling areas shall be underlain with spill-proof hardstanding or bund, with spill kits readily available and operatives trained in their use only. 4. All fuels and other non-aqueous fluids to be stored in suitable bunded enclosures. 5. All refuelling operations to be carefully overseen and managed. 6. Ensure that the integrity of any storage medium and its associated delivery point are inspected on a regular basis. 7. The personnel designated to receive deliveries of materials/fuel/ should receive practical training on how to prevent and respond to a spill 8. The designated personnel should also be aware of any potential areas in their vicinity that are at risk of contamination, such as fauna, flora, Ephemeral River Channels, or water supply borehole. 9. Clean up any site spillages and no spills shall be allowed to enter the environment / soak into the ground	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors

Table 3.23: Waste (solid and liquid) management.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Promotion of effective waste (solid and liquid) management through the adoption of sound and hierarchical approach to waste management, which would include waste minimisation, re-use, recovery, recycling, treatment, and proper disposal.	1. Burial of waste anywhere within the PEL area, campsites, layoff areas or survey lines is not allowed and all generated solid waste shall be disposed at an approved municipal waste disposal site in Rundu. A REN designated cell shall be created for easy auditing of all the waste transferred from the project to the Rundu waste disposal site. 2. Toilet and ablution facilities shall be provided at the campsites and along the survey lines and should not be located close to Ephemeral Rivers or water supply borehole. 3. Provide site information on the difference between the two main types of waste with clearly marked containers for: • General Waste. and • Hazardous Waste. 4. Sealed containers, bins, drums, or bags for the different types of wastes shall be provided. Never dispose of hazardous waste in the bins or skips intended for general waste. 5. All solid and liquid wastes generated from the proposed project activities shall be reduced, reused, or recycled to the maximum extent practicable. 6. Trash may not be burned or buried, except at approved sites under controlled conditions in accordance with the national and municipal regulations. 7. Never overfill any waste container, drum, bin, or bag. Inform your Contractor or the Environmental Control Officer / Site Manager if the containers, drums, bins, or skips are nearly full. 8. Never litter or throwaway any waste on the site, in the field or along any road. No illegal dumping. 9. Littering is prohibited. 10. Latrines and French drains built >100m from watercourses or pans to avoid pollution of primary and secondary aquifers. 11. Chemical toilets or suitable waste water management system shall be provided on site and around the camp as may be required. 12. A waste management plan documenting the waste strategy, storage (including facilities and locations), handling procedures and means of disposal should be developed and should include a clear waste-tracking mechanism to track waste consignments from the originating location to the final waste treatment and disposal location in compliance with the national and municipal regulations.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

Table 3.24: Rehabilitation plan.

ASPECT	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Contributions toward environmental preservation and sustainability through rehabilitation of disturbed areas such as campsites, layover sites and survey locations along the survey lines by removing all unwanted parts of the fixtures and restore the sites to as close an approximation of the pristine state as is technically, environmentally, financially and reasonably possible.	1. The following rehabilitation actions are practiced: • Rehabilitate all site scars. • Litter from the site has been taken to the appropriate disposal site. • Debris, scrap metal, etc. is removed before moving to a new site or closure of the operations. • Water tanks are dismantled and removed if not needed for after use. • Tracks on site and the access road are rehabilitated by smoothing the 'middle mannetjie' (middle ridge between the tracks) and raking the surface. 2. The following should be undertaken at all disturbed areas that require further rehabilitation • If applicable the stockpiled subsoil to be replaced (spread) and/or the site is neatly contoured to establish effective wind supported landscape patterns. • Replace the stored topsoil seed bank layer. • Five (5) years after rehabilitation the sites are not visible from 500 m away.	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors

Table 3.25: Environmental performance monitoring and data collection.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
1. Collect data that will add value to environmental monitoring and reporting to the regulators 2. Collect data that will add to the general scientific and geographic knowledge of the environment in which the exploration process takes place. 3. Acknowledge that the required skills and knowledge to collect all the suggested data may not be available within the exploration team, however, as much data as is practical should be collected.	1. Environmental Monitoring Report compiled and submitted by the Environmental Coordinator to the regulators 2. The following types of information should be gathered: • Fauna. What tracks or signs of animal activity have been seen or affected onsite? (Photographs and GPS recording) What animals, birds etc. were identified? Alternatively provide a description and/ or photo if unidentified. • Unusual weather conditions, e.g., records of the prevailing wind direction and the direction from which storm events come. Was there rain or intense heat? Preferably have a thermometer and rain gauge on site. • Vegetation. Record trees, shrubs, grass, etc. that are affected. Some plants do only occur after rainfall and might not have been seen for decades. • Any archaeological, cultural or historical sites that may be found and reported the project archaeologist. GPS co-ordinates, photograph and plot the position on a map with appropriate map scale. • Other-including surface water, large scale geological features etc	1. During planning and mobilisation (Pre-survey preparation) 2. During setup and operation of camp sites setups 3. During process of widening of tracks and creation of limited new access as may be applicable 4. During actual data acquisition along the individual profiles / survey lines 5. Demobilisation and Closure (Survey Completion) 6. During an accidental event that may be associated with the campsite and survey lines routine and physical presence operational activities	1. Proponent's Representative (PR) 2. Project Manager (PM) 3. ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers 4. Contractor 5. Subcontractors 6. New Cutlines / Access: MEFT, Community Forest and Conservancy Management Committee Members and local communal farmers

3.5 General Awareness and Training Guidance

3.5.1 Overview

The following is the summary of the general mitigation references and training guidance covering the proposed 2024 and 2025 2D/3D seismic survey operations planning and mobilisation (Pre-survey preparation), setup and operation of campsites setups, the process of widening of tracks and creation of limited new access as may be applicable, actual data acquisition along the individual profiles / survey lines, demobilisation and closure (survey completion) and management of accidental event that may be associated with the campsite and survey lines routine and physical presence related operational activities:

1. General mitigation guidance.
2. Natural environmental management guidance.
3. Vehicle use and access guidance.
4. Control of dust guidance.
5. Health and safety guidance.
6. Preventing pollution and dangerous working conditions guidance.
7. Saving water guidance.
8. Disposal of waste guidance.
9. Religious, cultural, historical, and archaeological objects guidance, and.
10. Dealing with environmental complaints guidance.

3.5.2 General Mitigation Guidance

Based on the Environmental Assessment undertaken, the following is the summary of the general mitigation measures in terms of applicability of the EMP, disciplinary process, meaning of environment and procedures if one does not understand the provisions of this EMP:

(i) The Environmental Rules apply to everybody. This includes all permanent, contract, or temporary workers as well as any other person who visits the operations base. Any person who visits the operations base will be required to adhere to the Environmental Code of Conduct of the Proponent.

(ii) The Site Manager will issue warnings and will discipline any person who breaks any of the environmental rules and procedures. Repeated and continued breaking of the Rules and Procedures will result in a disciplinary hearing and which may result in that person being asked to leave the site permanently.

(iii) The environment means the whole surroundings around us. The environment is made-up of the soil, water, air, plants, and animals. Those characteristics of the soil, water, air, plant, and animal life that influence human health and wellbeing.

(iv) If any member of the work force does not understand, or does not know how to keep any of the environmental rules or procedures, that person must seek advice from the Environmental Control Officer (ECO), Site Manager or Contractor. The person that does not understand must keep asking until she/he is able to keep to the all the Environmental Rules and Procedures.

3.5.3 Natural Environmental Management Guidance

1. Never feed, tease, or play with, hunt, kill, destroy, or set devices to trap any wild animal (including birds, reptiles, and mammals), livestock or pets. Do not bring any wild animal or pet to the area.

2. Do not pick any plant or take any animal out of the areas. You will be prosecuted and asked to leave the project area.

3. Never leave rubbish where it will attract animals, birds, or insects. Rubbish must be thrown into the correct rubbish bins or bags provided.

4. Protect the surface material by not driving over it unnecessarily.

5. Do not drive over sensitive habitats for plants and animals.

6. Do not cut down any part of living trees / bushes for firewood.

7. Do not destroy bird nest, dens, burrow pits, termite hills etc or any other natural objects in the area.

3.5.4 Vehicle Use and Access Guidance

1. Never drive any vehicle without a valid licence for that vehicle and do not drive any vehicle that appears not to be road-worthy.

2. Never drive any vehicle when under the influence of alcohol or drugs.

3. Do not make any new routes or roads without permission. Stay within permitted routes.

4. Avoid U-Turns and large turning circles. 3-point turns are encouraged. Do not ever drive in communal fields / ephemeral rivers, stick to the existing roads.

5. Stay on the road, do not make a second set of tracks and do not cut corners.

6. Do Not Speed - keep to 30 km/h along the survey lines and campsite.

7. No off-road driving is allowed.

8. Vehicles may only drive on demarcated roads.

9. Adhere to speed limits and drive with headlights always switched on.

3.5.5 Control of Dust Guidance

1. Do not make new roads or clear any vegetation unless instructed to do so by your Contractor or the Environmental Control Officer / Site Manager.

2. Try to disturb the surface of the natural landscape as little as possible.

3.5.6 Health and Safety Guidance

1. Drink lots of water every day, but only from the fresh water supplies.

2. Take the necessary precautions to avoid contracting HIV/AIDS or COVID-19.

3. Only enter or exit the operations area at the demarcated areas.

4. Do not litter and always keep the access areas clean.

5. Any damage to any existing infrastructure in the area must be reported to the Environmental Control Officer / Project Manager who will then inform the owner of any damage with all the repairs done to the satisfaction of the owner or Environmental Control Officer.

6. Never enter any area that is out of bounds, or demarcated as dangerous or wander off without informing or permission of team leader.

7. Report to your Contractor or the Site Manager if you see a stranger or unauthorised person in the operations areas.

8. Do not remove any vehicle, machinery, equipment, or any other object from the operations areas /sites without permission of your Contractor or the Site Manager.

9. Wear protective clothing and equipment required and according to instructions from your Contractor or the Site Manager.

10. Never enter or work in the operations areas when under the influence of alcohol or drugs.

3.5.7 Preventing Pollution and Dangerous Working Conditions Guidance

1. Never throw any hazardous substance such as fuel, oil, solvents, etc. into streams or onto the ground.

2. Never allow any hazardous substance to soak into the soil.

3. Immediately tell your Contractor or Environmental Control Officer / Site Manager when you spill, or notice any hazardous substance being spilled anywhere in the operations areas.

4. Report to your Contractor or Environmental Control Officer / Site Manager when you notice any container, which may hold a hazardous substance, overflow, leak, or drip.

5. Immediately report to your Contractor or Environmental Control Officer / Site Manager when you notice overflowing problems or unhygienic conditions at the ablution facilities.

6. Vehicles, equipment and machinery, containers and other surfaces shall be washed at areas designated by the Contractor or Environmental Control Officer/ Site Manager.

7. If you are not sure how to transport, use, store or dispose any hazardous substance - Ask your Contractor or Environmental Control Officer / Site Manager for advice.

3.5.8 Saving Water Guidance

1. Always use as little water as possible. Reduce, reuse and re-cycle water where possible.

2. Report any dripping or leaking taps and pipes to your Contractor or Environmental Control Officer or Site Manager.

3. Never leave taps running. Close taps after you have finished using them.

3.5.9 Waste Management (Solid and Liquid Waste)

1. All generated solid waste must be disposed at the local municipal waste disposal site.

2. Use toilets and ablution facilities provided on site.

3. Learn to know the difference between the two main types of waste, namely:

    - General Waste. and

    - Hazardous Waste.

4. Learn how to identify the containers, bins, drums, or bags for the different types of wastes. Never dispose of hazardous waste in the bins or skips intended for general waste or rubble / contaminated soil.

5. Never burn or bury any waste around the operations areas.

6. Never overfill any waste container, drum, bin, or bag. Inform your Contractor or the Environmental Control Officer / Site Manager if the containers, drums, bins, or skips are nearly full.

7. Never litter or throwaway any waste on the site, in the field or along any road. No illegal dumping.

8. Littering is prohibited.

3.5.10 Religious, Cultural, Historical and Archaeological Objects Guidance

1. If you find any suspected religious, cultural, historical, or archeologically object or site around the operations areas, you must immediately notify your Contractor or Environmental Control Officer **/** Site Manager.

2. Never remove, destroy, interfere with, or disturb any religious, cultural, historical, or archaeological object or site around the operations areas.

3.5.11 Dealing with Environmental Complaints Guidance

1. If you have any complaint about dangerous working conditions or potential pollution to the environment, immediately report this to your Contractor or the Environmental Control Officer / Site Manager.

2. If any person complains to you about vibrations, dust, noise, lights, littering, pollution, or any other harmful or dangerous condition, immediately report this to your Contractor or the Environmental Control Officer / the Site Manager.

4. REHABILITATION AND MONITORING

4.1 Rehabilitation Commitment and Process

The following is the summary of the key rehabilitation processes to be implemented by the Proponent with respect to the layover, fly-over or base sites and survey locations along each of the survey lines:

Step 1: Remove all layover, fly-over or base sites structures:

- Remove all the site supporting infrastructure such as housing container / tents.
- Disassemble all the structures and remove all materials from the layover, fly-over or base sites.
- Remove all machinery from the site and transport to a new site where it is to be used or stored or sold at an auction.
- Remove all signages and fences that have been constructed and either make the material available to the local persons/farmer, dispose at a suitable site or sell at an auction.
- Remove the generators from the sites and either transport to a new site for storage or sell it to the farmer or an auction.
- Seal all petrol, diesel, oil, and grease containers and remove from the site to a storage facility.
- Collect all scrap metal and dispose at a suitable site or sell at an auction.
- Break up all concrete slabs and structures on site and transport the fragments to a suitable municipal waste disposal or use a fill material along the sandy / slippery / muddy access road.
- The concrete reservoirs if created, can probably remain intact provided that the local people wish to utilise them at some stage - this will need to be negotiated.
- The future use of the water borehole/s and water pipelines as well as any additional infrastructures that has been added to the borehole shall be handed over to the Regional Council who will work with the local community on usage and maintenance of the infrastructure, and.
- Any unused pipes shall be removed, disassemble, and component parts transported to a storage site or sell at an auction.

Step 2: Remove all waste and unwanted materials:

- All campsite materials shall be removed and entire site rehabilitated.
- Clean the site, collect all the waste materials and transport to a suitable municipal waste disposal site, and.
- Manually remove all weedy species that are present at the site (the entire plant can easily be removed because the plants tend not to root deeply).

Step 3: Rehabilitate surrounding impacted areas

- Compaction of the substrate will result from utilisation of these areas or the pressure of overlying structures.

- ❖ Rip the surfaces to a depth of 40 cm to 50 cm using a multi-toothed ripper and tractor.
- ❖ Cover with a layer of topsoil to a depth of about 10 cm, and.
- ❖ Cap the topsoil containing the seedbank with a layer of gravel by manually spreading the fragments across the surface using a rake.

Step 4: Rehabilitate the affected tracks and roads

- ❖ All tracks impacted by the proposed 2024 and 2025 2D/3D seismic survey operations shall be rehabilitated by smoothing the 'middle mannetjie' (middle ridge between the tracks) and raking the surface.

4.2 Environmental Performance Monitoring and Reporting

The monitoring of the environmental performances for the proposed 2024 and 2025 2D/3D seismic survey operations is divided into two (2) parts and these are:

(i) Routine daily monitoring activities to be undertaken by the ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers with the support of the external specialist consultants such as the wildlife, water, flora, and local cultural knowledge experts as may be required, and.

(ii) Preparation of the final Environmental Monitoring and Environmental Closure reports covering all activities related to the implementation of the Environmental Management Plan to be undertaken by the ESG/ Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers with the support of the external specialist consultants as may be required.

The Proponent will be required to report regularly (twice in a year or as the case may be) to the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT), the environmental performances as part of the ongoing environmental monitoring programme. Environmental monitoring programme is part of the EMP performance assessments and will need to be compiled and submitted as determined by the Environmental Commissioner. The process of undertaking appropriate monitoring as per specific topic (such as water, fauna, and flora) and tracking performances against the objectives and documenting all environmental activities shall be part of internal and external auditing supported by the ESG / Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers (Tables 4.1- 4.9).

The creation of new survey cutlines especially those that may be used as firebreaks shall be monitored and supervised by MEFT Forestry officials. All big trees and protected trees including those shown in Plates 4.1-4.6 shall be monitored not to be cut down and affected in any way during the proposed project implementation process including the creation of the proposed firebreaks. Big trees and protected species (Plate 4.1 – 4.6) shall be left along the new survey or firebreak cut lines.

The second part of the monitoring of the EMP performance will require a report outlining all the activities related to effectiveness of the EMP at the end of the proposed 2024 and 2025 2D/3D seismic survey operations to be undertaken by the ESG / Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers with the support of the external specialist consultants as may be required. The objective will be to ensure that corrective actions are reviewed and steps are taken to ensure compliance for future EIA and EMP implementation.

The monitoring report shall outline the status of the environment and any likely environmental liability after the completion of the proposed project activities. The report shall be submitted to the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism and will represent the final closure and fulfilment of the conditions of the Environmental Clearance Certificate (ECC) and Notifications of the Decisions issued by the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT) dated 2nd July 2021.

Table 4.1: Monitoring of environmental performance implementation / environmental awareness training.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there an Environmental awareness training programme?					
How many people have been given environmental awareness training?					
Is a copy of the EMP on site?					
How effective is the awareness training? Do people understand the contents of the EMP? Where are the weaknesses? Ask 3 people at random various questions about the EMP.					

Table 4.2: Monitoring of environmental performance for the temporal and permanent structures.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are the temporal and permanent structures positioned to avoid sensitive or potentially sensitive sites?					
Has new infrastructure been created? If so, what, and how well planned / built with respect to environment?					
Have toilets been provided? Where are they situated?					
Do receptacles for waste have scavenging animal proof lids?					
What litter is there – who is littering?					
Are there facilities for the disposal of oils / etc and how often is it removed to an approved disposal site?					
Is there evidence of oil / diesel spills? Bunding or not?					
What fuel source is being provided for cooking?					
Housekeeping					

Table 4.3: Environmental data collection.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are records being kept?					
Birds' mortality records as result of the project activities?					
Birds nesting activities around the operations area?					
Noise level?					
Air Quality?					
Vibrations?					
Have archaeological sites been found / disturbed / described?					
Other key environmental data sets?					

Table 4.4: Health and safety.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there First Aid Kit containing anti-histamines etc?					
Are dangerous areas clearly marked off?					
Do vehicles appear to maintain the recommended speed limits?					
Do vehicles always drive with headlights on?					

Table 4.5: Recruitment of labour.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
What labour source is used?					
How has the recruitment practice been done?					

Table 4.6: Management of the natural habitat and surficial materials management.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Has there been any development done on or very close sensitive areas?					
Has anyone been caught with plants or animals in their possession?					
Has there been wilful or malicious damage to the environment?					
Tracks and path widening been conducted through pruning of branches only?					
Are there big trees been cut down unnecessarily during the track widening or creation of the firebreaks?					
Are protected trees such as Baikiaea plurijuga (Zambezi teak), Burkea africana (burkea), Guibourtia coleosperma (false mopane), Pterocarpus angolensis (kiaat), Schinziophyton rautanenii (manketti) and Strychnos species (monkey orange spp.) as shown in Plates 4.1-4.6 being protected and not removed or damaged?					

Table 4.7: Roads and tracks driving.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are existing tracks used and maintained?					
What new tracks have been developed and are they planned?					
What evidence is there of off-road driving? Who appears to be responsible?					
Are corners being cut, what type of turning circle are there? Three point turns vs. U turns?					
Have unnecessary tracks been rehabilitated and how well?					
Comments					
All tracks impacted by the proposed 2024 and 2025 2D/3D seismic survey rehabilitated by smoothing the 'middle mannetjie' (middle ridge between the tracks) and raking the surface					

Table 4.8: Management of water resources.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
How is potable water supplied and how often?					
Is water being wasted?					
Is there any leakage from pipes or taps?					

Table 4.9: Public relations.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Have any complaints been made about the project activities by the different I&APs? If so, what, and how was the issue resolved?					

Plate 4.1: *To be monitored Baikiaea plurijuga* (Zambezi teak – Near Threatened, IUCN 2020) – protected – has been targeted extensively for illegal logging purposes (Cunningham, 2021).

Plate 4.2: To be monitored *Burkea africana* (burkea) – protected – are some of the taller trees in the area and are targeted for timber and firewood production (Cunningham, 2021).

Plate 4.3: To be monitored *Guibourtia coleosperma* (false mopane) – protected – is a valuable fruit tree in the area (Cunningham, 2021).

Plate 4.4: To be monitored *Pterocarpus angolensis* (kiaat) – protected – have been heavily utilised in the past for timber production (Cunningham, 2021).

Plate 4.5: To be monitored *Schinziophyton rautanenii* (manketti) – protected – is a valuable fruit tree in the area (Cunningham, 2021).

Plate 4.6: To be monitored *Strychnos* species (monkey orange spp.) – protected – are valuable fruit trees throughout the area.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based on the findings and recommendations of the EIA Report, lessons learned from the Phases I, II and III 2D seismic surveys and the mitigation measures contained in this EMP Report, it is hereby recommended that the 2nd July 2024 expired Environmental Clearance Certificate (ECC) No. 01491 shall be renewed and amended to support the proposed 2024 and 2025 2D/3D seismic survey operations over the key Areas of Interest (AOI) in PEL No. 73. The proposed 2024 and 2025 2D/3D seismic survey operations (activities) forms part of the exploration commitments that the Proponent has agreed to, as detailed in the Petroleum Agreement signed between the Proponent and the Government of the Republic of Namibia, represented by the MME (Competent Authority).

Although the proponent intends to conduct the proposed 2024 and 2025 2D/3D seismic survey operations using Vibroseis trucks, the EIA Report and this EMP Report prepared to support the applications for the renewal and amendment of the ECC No. 01491 provide for the use of either the Vibroseis or Explorer 860 as the energy source.

Mitigation measures for both positive and negative impacts have been proposed and management strategies are provided in this EMP Report for the proposed 2024 and 2025 2D/3D seismic survey operations in the Petroleum Exploration License (PEL) No. 73 covering Degree Square Blocks 1719, 1720, 1721, 1819, 1820 and 1821 in Kavango Sedimentary Basin, Kavango West and East regions, northern Namibia. The mitigation measures provided in this EMP covers the proposed survey planning and mobilisation (Pre-survey preparation), setup and operation of fly-camps setups, the process of widening of existing tracks and creation of new survey cutline, firebreak cut lines, actual data acquisition along the individual profiles / survey lines, demobilisation, and closure (survey completion) and management of accidental events that may be associated the entire project operations.

5.2 Recommendations

The following is the summary of the recommended actions to be implemented and monitored by the Proponent as part of the implementations of the EMP for fly-camps, layover sites, and survey locations along the proposed survey lines:

1. The Proponent shall adhere to the provisions of all the national legislation, regulations, policies, procedures, and permits / authorisation requirements.

2. The proponent shall adhere to all the provisions of this EMP and mitigation measures shall be implemented and monitored.

3. Before the implementation of the proposed 2024 and 2025 2D/3D seismic survey operations, the Proponent shall consult with the local community / owners of the communal fields and villages that may be affected or likely to be disturbed by the proposed project activities. All the consultations and engagements shall be undertaken through the following existing regional and local communication structures from top to bottom:

    - ❖ Office of the Governors for Kavango East and West Regions.
    - ❖ Constituency Councillors.
    - ❖ Traditional Authorities.
    - ❖ Senior Headman/ Woman.
    - ❖ Village Headpersons.
    - ❖ Relevant famers, community forests, conservancy and associations, communities and committees.

- ❖ Village Development Committees (VDCs), and.
- ❖ Local community levels.

4. Before any form of field-based activities are started in a local area, written consent shall always be obtained from the land owners / local community through the village headperson, famers, community forests, conservancy and associations, communities and committees, traditional authorities, and regional council as may be applicable to avoid misunderstanding and unnecessary conflicts.

5. Appropriate setback distances (exclusion zones) around sensitive structures such as villages, boreholes, water wells, dams, pipelines, burial grounds, cultural sites, irrigation canals and monuments / archaeological resources sites shall always be observed as provided for by the International Association of Geophysical Contractors (IAGC) the Distance Requirements Exploration Directive 2006-15, Alberta Government, Canada guidelines, and.

6. Precautionary principles / approaches shall always be exercised especially in situations where specific mitigations, regulatory guidelines, standards, or appropriate setback distances (exclusion zones) around sensitive local cultural resources such as burial or cultural sites have not been provided. Local communities, famers, community forests, conservancy and associations, communities and committees shall always be consulted on matters related to sensitive local cultural resources not provided for in the international guidelines / standards.

7. Project Location: The locations of the proposed profiles / survey lines are based on the findings of the detailed field-based survey / scouting activities that were undertaken by the Proponent and verified by Risk-Based Solutions team in May and June 2024 as part of the process of assessing alternative profile routes. The Proponent will also need create new cutlines for data acquisition in some places for 2025 2D/3D planned survey operations. Some tracks may require limited clearing / widening along certain sections to allow for the survey trucks to pass easily. Trees and low vegetation shall not be cut unnecessarily along the new cutlines, existing tracks, access, and fly-camp areas. Various alternative tracks, roads, already disturbed areas, and village footpaths aligned in the north-south and east-west directions do exist within the survey area and must be used to avoid unnecessary cutting of vegetation and disturbance / disruption of pristine habitats.

8. New Cutlines: Creation of new cutlines to be used for seismic data acquisition and possible firebreaks as may be requested by the local community / MEFT around Nacute, northeastern conner of Gcwatjinga Community Forest, southwestern conner of Ncaute Community Forest and portions of the Commercial Farms on Communal Land Nos. 1548, 1560,1561, 1562, 1563, and 1564, with no existing access for the 2025 2D/3D seismic survey area shall be supervised by the MEFT Forestry Department Team/Farmers. Forests/Farmers Committee / Associations Members and local communal farmers shall all be fully involved in selection, and creation of the such firebreak cutlines request.

9. Base Camp: Accommodation for the exploration team will be provided at local lodge and will be organised similar to the successful arrangements that were adopted for the Phases I, II and III 2D seismic surveys operations.

10. Fly-camps: The fly-campsite shall be situated on already disturbed areas such as an unused previous agricultural field after obtaining written permission and signing of a formal Lease Agreement with the land owner.

11. Freshwater supply shall be provided from the existing infrastructures in the general areas and there will be no need of drilling a new water supply borehole/s specific for the proposed 2024 and 2025 2D/3D seismic survey operations. The drilling locations within the survey area all have dedicated water supply boreholes for the project. Bottled drinking water shall be provided around the campsite and along the survey lines / profiles.

12. Source of energy shall be supplied from renewable solar installation or generator as may be required.

13. Waste water management must utilise mobile chemical toilet system around the fly-camps and along the survey lines / profiles.

14. Solid Waste Management: Very small amount of solid waste is expected to be generated during the planning and mobilisation, data acquisition, demobilisation, and abandonment stages of the proposed 2024 and 2025 2D/3D seismic survey operations. Waste disposal bags / containers must be provided and visible around the base and fly-camps and along the survey lines / profiles. Solid waste collected at fly-camps and along the survey lines shall be brought to Rundu on a daily basis for recycling, reuse and safe disposal at the municipal solid waste disposal facility. Littering around the base and fly-campsite and along the survey lines / profiles is strictly prohibited. Waste minimisation and reduction, re-use and recycling are highly encouraged and awareness raising must be undertaken on a continuous basis and the team must always be reminded of their obligations towards effective waste management practices and overall environmental management at each debriefing session.

15. Before detailed site-specific activities such as the campsite clearing or track widening or extensions activities, the ESG / Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers with the support of the external specialist consultants as may be required, should consider the flora, fauna, and archaeological sensitivity of the area. Protected flora shall be identified and marked not to be accidentally cut down.

16. The ESG / Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers shall lead, implement, and promote environmental protection culture through awareness raising of the workforce, contractors, and sub-contractors.

17. The Proponent shall provide all the necessary support including human and financial resources needed by the ESG / Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers in the implementation of the mitigations, effective environmental management, and monitoring throughout the proposed project duration.

18. The ESG / Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers with the support of the external specialist consultants shall develop simplified environmental induction and awareness materials for all the workforce, contractors, sub-contractors and visitors.

19. Where contracted service providers are likely to cause environmental impacts, these will need to be identified and contract agreements need to be developed with costing provisions for environmental liabilities.

20. A targeted and transparent local recruitment process must be put in place by the Proponent to avoid unnecessary high job expectation from the local community as well as manage potential job recruitment frauds targeting local communities.

21. Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA as may be required, and.

22. Final Environmental Monitoring Closure report shall be prepared by the ESG / Environmental Manager/Project HSE Coordinator/ Wildlife Monitoring Experts/ Community Liaison Officers with the support of the external specialist consultants as may be required to be submitted to the regulators and to mark the completion and closure of the proposed 2024 and 2025 2D/3D seismic survey operations.

EMP END