



Timor
Resources

Operating Management System
Environmental Impact Assessment - Drilling Activity
PSC TL-OT-17-08
Doc No: TR-HSE-EIA-001

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Timor
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ENVIRONMENTAL MANAGEMENT PLAN (EMP)

DRILLING ACTIVITY

PSC TL-OT-17-08



TR-HSE-PLN-006

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ABBREVIATIONS

AAQ	Ambient Air Quality
AASHTO	American Association of State Highway and Transportation Officials
AKO	Adjustable Kick Off
ANPM	Autoridade Nacional do Petróleo e Minerais
API	American Petroleum Institute
AQG	Air Quality Guidelines
ASTM	American Society for Testing and Materials
AWS	Automated Weather Station
BAS	Business Activity Survey
BHA	Bottom Hole Assembly
BOE/d	Barrels of Oil Equivalent per day
BOP	Blowout Preventer
CBL	Cement Bond Log
CFC	ChlorofluoroCarbon
CMC	Carboxy-methylcellulose
CO	Carbon Monoxide
CR	Critically Endangered
CSR	Corporate Social Responsibility
dBA	A-weighted decibels
DEM	Digital Elevation Model
DHS	Demographic and Health Survey
DNAS	Direcção Nacional das Aguas e Saneamento
DNMG	Direcção Nacional de Meteorologia e Geofísica
DST	Drill Stem Test
DTM	Digital Terrain Model
EBC	Escola Basico Central
EBF	Escola Basico Filial
EBS	Environmental Baseline Survey
ECD	Equivalent Circulating Density
ED	Eastern Drilling

EDTL	Eletricidade de Timor Leste
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMoP	Environmental Monitoring Plan
EMP	Environmental Management Plan
EMW	Equivalent Mud Weight
EN	Endangered
ENSO	El Nino Southern Oscillation
ERP	Emergency Response Plan
GDP	Gross Domestic Product
GDS	General Directorate of Statistics Timor Leste
GERTil	Grupo de Estudos de Reconstrução de Timor-Leste
GHG	Greenhouse Gases
HC	Hydrocarbon
HDPE	High-Density Polyethylene
HIV/AIDS	Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome
HSE-MS	Health Safety Environment Management System
IFC	International Finance Corporation
ILO	International Labour Organization
IMCI	Integrated Management Child Illnesses
IOD	Indian Ocean Dipole
IOGP	International Association of Oil & Gas Producers
IPCC	International Panel for Climate Change
IPIECA	International Petroleum Industry Environmental conservation Association
ISO	International Standard for Organization
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
KCl	Potassium Chloride
KPI	Key Performance Indicator
LCM	Lost Circulation Material
Leq	Equivalent Continuous Sound Level

Lmax	Maximum Continuous Sound Level
LNG	Liquid Natural Gas
LOC	Loss of Containment
LOT	Leak off Test
MAE	Município Administração Estatal
MAFF	Ministry of Agriculture, Forestry & Fisheries
MDG	Millennium Developments Goal
MJO	Maden-Julian Oscillation
MoF	Ministry of Finance
MSL	Mean Sea Level
MW	Mud Weight
MWD	Measured While Drilling
NADF	Non-Aqueous Drilling Fluid
NAPA	National Adaption Plan and Action
NOC-TL	Nacional Oil Company of Timor Leste
NORMS	Naturally Occurring Radioactive Materials
NO_x	Nitrogen Oxide
NPHC	National Population and Housing Census
NT	Near Threatened
NTU	Nephelometric Turbidity Unit
OCHA	Office for the Coordination of Humanitarian Affairs
OECD	Organization for Economic Cooperation and Development
OMS	Operating Managements System
OPS	Oficiais Policia Comunitaria
OSCP	Oil Spill Contingency Plan
P&A	Plug and Abandonment
PACCSAP	Pacific-Australia Climate Change Science and Adaptation Planning
PDCA	Plan-Do-Check-Act
PDM	Positive Displacement Motor
PHPA	Partially Hydrolysed polyacrylamide
PM	Particulate Matters

PPE	Personal Protective Equipment
PSC	Production Sharing Contract
PSL	Product Specification Level
RPM	Rotation Per Minute
rr	Restricted Range
SEIS	Simplified Environmental Impact Statement
SEPFOPE	Secretaria de Estado para a Política de Formação Profissional e Emprego
SISCA	Servisu Integradu Saúde Comunitária
SLM	Sound Level Meter
SMC	Safety Management Consultancy
SME	Small and Medium-sized Enterprises
SO₂	Sulphur Dioxide
SO_x	Sulphur Oxide
SOP	Standard Operating Procedure
SRTM	Shuttle Radar Topography Mission
SSB	Suai Supply Base
TD	Total Depth
TDS	Total dissolve Solid
ToR	Terms of Reference
TR	Timor Resources
TSS	Total suspended Solid
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nation for Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework for Climate Change Convention
URTI	Upper Respiratory Tract Infection
USGS	The United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compound
VU	Vulnerable




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WB	World Bank
WFP	World Food Program
WHO	World Health Organization
WHT	Withholding Tax
WMP	Waste Management Plan
WOC	Wait on Cement

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1 EXECUTIVE SUMMARY

Timor Resources Pty Ltd acquired onshore PSC No.: TL-OT-17-08 in Suai Municipality on 7 April 2017. The licence covers 1445.2 km², comprising 1,057.8 km² onshore and 387.4 km² in the near offshore to an average distance of 7km from the coastline, which is 64km long, and up to 34.5 km inland.

1.1 PURPOSE

The project is to conduct exploration drilling of up to five identified well locations, namely Kumbili, Karau, Lafaek, Laisapi and Raiketan. These wells are located in sub districts of Suai, Maukatar and Zumalai in Covalima municipality. The exploration drilling is planned to commence in early 2021, subject to easing of restrictions imposed due to Covid-19 pandemic.

These five wells were identified as a result of prospect evaluation carried out by Timor Resources exploration team which ultimately defined the targeted plays to be drilled.

The drilling activity has the potential to have environmental impact, thus the drilling activity was defined as Category ‘A’ according to Article 4, 1a and Annex I of the Decree Law No. 5/2011 of Environmental Licensing. Therefore, Timor Resources is required to submit a Terms of Reference (ToR), Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) seeking Environmental Authority approval in order to gain an Environmental Licence to allow for drilling to commence.

The methods used for the identification and assessment of potential impacts associated with the project meet Timor Leste legislative requirements, as defined under Environmental Licensing Decree Law 5/2011 and supporting Ministerial Diploma 46, which describes the approach required by Timor Resources to identify the project impacts, in particular for each project phase: construction, operation and decommissioning. Further it is noted that under Decree Law No 27/2020 dated 19 June Organic Law of VIII Constitutional, Article 33 (c) the Minister of Petroleum and Minerals is responsible to conduct the respective environmental licensing procedures and approve the corresponding environmental licenses in that sector.

1.2 SUMMARY OF ACTIVITIES

1.2.1 Project Description

The project activities are broken down into three phases with regard to impact assessment: Pre-drilling/Construction, drilling operations, decommissioning and project activities are summarised as follows:



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Geotechnical, Geochemical and Topographic surveys - Surveys are conducted to gain understanding of the topography and soil characteristics of well sites and road access to undertake site design planning and subsequent civil works.

Land clearance for road access and site construction - The arable topsoil and vegetation is stockpiled on the side of the lease within the fence line or in the case of access corridors, to the side of the road. The topsoil will be used to rehabilitate the site once drilling is completed in areas which are no longer required. Access roads will be 6m wide with 10 - 20m of clearance for wide loads.

Road and bridge surveys plan - Surveys have been conducted on existing roads, bridges, and highways and mapped for the rig moves (Symes 2020). All options have been reviewed for transportation, loads will be managed within the appropriate allowable road load capacity.

Establish water supply - Daily water needs for drilling are estimated to be up to 60,000 litres per day. Water will be sourced from local contractors. Water storage tanks on site will be filled and a mud system mixed prior to spud of the well. The level of offtake from the water source will be such that it is not detrimental to the supply for other users.

Well Site - The base layout design for ED Rig#1 is 100m x 100m and has been adjusted to the orientation and restrictions of each location. Two 3m deep mud pits with approximate dimensions of 18 x 20m and 14 x 30m will be prepared for mud handling and circulation. An impermeable geomembrane will be used in the pit as barriers to prevent soil contamination in case of any presence of harmful substance. The pits will be fenced off within the compound for safety reasons.

Drilling Operations - It is proposed to drill up to five wells, with each well design based on interpreted geological and geophysical data. The Drilling operation will be conducted as per the well specific drilling programs as approved by ANPM. The procedures employed will be standard onshore oilfield best practice. Drilling operations will be conducted around the clock. The time taken to drill a bore hole depends on the depth of the hydrocarbon bearing formation and the geological conditions and is expected to be in the order of 30-50 days.

Well Testing - Where a hydrocarbon formation is found, initial well tests, lasting up to a month, may be conducted to establish flow rates and formation pressure. These tests may generate oil, gas and formation water, each of which will be managed on site.

Rig Move - Rig moves from one location to the next have been planned and routes assessed including review of road width, intersections, bridges, community and public infrastructure.



Decommissioning - If the well does not contain commercial quantities of hydrocarbon, the site is decommissioned to a safe and stable condition and restored to its original state or to a state as agreed with landowners and approved by the appropriate authorities. Open rock formations are sealed with cement plugs to prevent upward migration of wellbore fluids.

1.2.2 EIA Activities

The main stages completed in the preparation of this EIA are as follows:

Project Description - prepare the formal Project Description submission following Ministerial Diploma 46/2017 Annex I.

Terms of Reference - determine the main components of the project proposal and study area, define legal requirements, environmental description, methodologies for undertaking the assessment, alternatives, identify potential significant issues, following Ministerial Diploma 46/2017 Annex III.

Consultation - information provided to local authorities and the public about the project so that parties can make informed contributions to the project and EIA process, and take account of issues raised by consultees. Stakeholder consultation with the affected communities in the project area has been underway since before the 2019 seismic survey.


Baseline Survey - completed baseline survey to identify existing environmental conditions.

Impact Identification and Prediction - assess the likely effects of each well program on the environment. Direct, indirect, short, medium and long term, positive and negative effects covered for pre-project/construction, operations and decommissioning. The assessment focused on key issues, through scoping, and the scale and significance of potential impacts was predicted.

Significance of Impacts - following impact identification and assessment, the significance of the effects on the environment and the local community were determined by reference to an accepted criteria and standards using subjective judgement.

Impact Mitigation - The measured impact and assessment of its significance lead to the determination of mitigation measures.

Preparation of the Environmental Impact Statement (EIS) - following Ministerial Diploma 46/2017 Annex IV.

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1.3 ALTERNATIVES

The following alternatives were assessed as part of the project:

- **well location** - As a result of the assessment all well locations were considered to have taken full consideration of environmental, social, cultural and economic issues and the Raiketan location was relocated on safety grounds.
- **project design (vertical v directional drilling)** - An early decision was made to opt for vertical, straight holes on safety and cost grounds, however for completeness a short description of vertical v directional drilling was provided.
- **water source** - Water supply will be met by local suppliers since the level of offtake is such that it is not detrimental to the supply for other users. Furthermore, a water well and storage is available at Haemanu camp if required.
- **power supply** - Power for the rig will be supplied from diesel generators on site to ensure consistent supply, the Haemanu camp will utilise mains supply with a back up generator as required.
- **cuttings disposal** - Cuttings will be encapsulated in an impermeable liner on site after dewatering.
- **drilling fluids** - Water based drilling fluids will be utilised throughout the project.
- **“No Project”** - A “No Project” alternative was rejected.

1.4 ENVIRONMENT

Climate and Meteorology - The climate of Timor-Leste is characterised by extreme conditions. In the north of the island there is little or no rain for almost eight months of the year. The island has a monsoon climate, typical for the Asian tropics. From December to March northwest to southwest winds prevail, bringing the principal wet season for the year to most parts of the island. From May until October southeast to northeast winds prevail, bringing mostly dry conditions, except on the south coast and the southern slopes where the wet season persists until July. Average annual rainfall is around 1,500mm, varying from 565mm at Manatuto along the north coast to 2,837mm at Lolotai in the central-western mountains. As is common in most tropical locations, extremely heavy rainfall occasionally occurs in Timor-Leste during relatively short time intervals.

There is little temperature variation on either a diurnal or a seasonal basis. Temperature variations mainly occur with altitude. Average annual temperatures decrease from 27°C at sea level to 24°C at 500 m; 21°C at 1 000 m; 18°C at 1,500m and 14°C at 2,000m. Relative humidity varies between 70 and 80 percent, which makes the climate humid in general, but pleasant (FAO, 2016).

The tropical cyclone season in the Timor Sea normally runs from November to April. Many tropical storms and cyclones originate or pass through the Timor Sea. Between 1964 and 2002, 25 cyclones were recorded (RDTL, 2010).



Topography - Located at the southern coast of Timor (Covalima municipality), all the proposed well location situated on the lowland region bounded to the north by mountainous region with the highest peak called Foho Mesak (*Mount Mesak*) near the border between Timor-Leste and Indonesia. Topography for each well location is described as follows:

- **Karau-1:** The location sits in a small surface water catchment area; the natural drainage direction is to the south but has been heavily modified by the urbanisation in the area. The drainage ditch along the road adjacent to the southern edge of the site will be upgraded to allow for diversion of water to the Caraulun River, 200m to the east.
- **Kumbili-1:** The location is situated within the confines of the Suai Supply Base Boundary. It is in an area of natural vegetation and sparse cultivation. Surface water run-off will be diverted around the site and continue to the stream to the south, minimising disruption to the natural flow.
- **Lafaek-1:** Is located on the southern side of the TasiMane Expressway, it occupies a small catchment area which will be diverted around the location to a stream to the southwest.
- **Laisapi-1:** Is the easternmost location in PSC TL-OT-17-08, approximately 1km from the township of Kuluan. The site occupies a position within lightly vegetated woodland to the south of an extensively cultivated and irrigated catchment area. The area is low lying, with an elevation drop of only 28m over a distance of 4km within the catchment. Hence, whilst there is potential for flooding at the location, the depth of water would be shallow and diverted around the site to the natural watercourse to the south. No existing infrastructure exists within 350m of the location.
- **Raiketan-1:** The ideal technical location is within the Raiketan River, so the site will be located on the southern bank with natural drainage to the south but would be diverted to the east into the Raiketan River to minimise impact on the local community infrastructure.

Geology - All five drilling locations are located on Suai basin, a synorogenic basin of late Miocene to recent. The basin itself lies unconformably above the Timor thrust belt. Origin of the basement rock itself, however, is somewhat contradictory due to different interpretation of Lolotoi Metamorphic Complex.

In terms of local geology, Karau, Kumbili and Laisapi are covered on the surface by recent alluvium sediments. The main source of sediments in this area is coming from the mountainous region to the north transported by a few braided rivers. Raiketan well is bounded by a series of reverse fault that thrusting the Babulu formation above the Aitutu

Formation. In Lafaek well location, dominant Lithologies are of the Ainaro Formation a poorly sorted pebbles conglomerate and quaternary reef Baucau Limestone.

Air Quality - The existing air quality in the project area has been sampled and additional secondary data from the Suai Supply Base project (Worley Parsons 2012) accessed and both compared against World Health Organisation standards (WHO 2005). The assessment shows that most existing sources of air pollutants (dust particles as PM_{2.5} and PM₁₀ and gases such as nitrogen dioxide, sulphur dioxide and carbon monoxide) originate mainly from human activities such as dust from roads, vehicle exhausts, power generation exhausts, smoke from cooking stoves and the burning of vegetation. Current air quality indicators are all below the limit of reporting or the assessment criteria set in the standards.

In the case of diesel generators and vehicle engines the emissions levels were calculated based on fuel usage and using recognised emission estimate methodology. Each well program is expected to take 30 days and based on this the emissions were calculated at some 480 tonnes CO₂ and 500 tonnes GHG per well. The levels are insignificant in comparison with other operations in Timor and globally. In 2018, CO₂ emissions per capita for Timor-Leste was some 275,000 tonnes.

The total release of CO₂E during the drilling operations is estimated to be 490 tonnes of CO₂E per well, as shown in . Significant greenhouse gas (GHG) emissions occur from all oil and gas operations worldwide (>100,000 tons CO₂ equivalent per year) IFC (2007).

Timor-Leste is a minor emitter of greenhouse gases, and therefore mitigation is not currently an important issue in the country, but adaptation will be (World Bank 2009). Carbon dioxide emissions (0.2 tonnes) are low compared with Indonesia (1.4 tonnes) but at the same level as Lao PDR. The GHG emissions arising from the proposed activities are insignificant (approximately 0.2%), and therefore will not significantly impact the environment.

Noise - as with air quality noise levels were measured in the project area and additional secondary data from the Suai Supply Base project (Worley Parsons 2012) accessed with both compared against IFC Guidelines (IFC 2007a) and WHO guidelines for community noise (Berglund et. al. 1999). Overall the noise levels measured during the baseline survey are between 36dB and 66dB i.e. less than 70dB (WHO Industrial standard), with most below the residential limit of 55dB. The expected levels of noise during operations will be in the region of 40-60 dB(A) at the perimeter fence falling to 30-40 dB(A) 350m from the rig.

Surface and Groundwater - a total of five surface water and five groundwater samples were collected and tested in accordance with the WHO Drinking Water Guidelines (WHO 2011). All parameters tested were within the relevant limits.



The nearest surface water to the well locations are Raiketan River 50m from the Raiketan well site and the Karau River 250m from the Karu well site. These rivers are seasonal as the water flows is mostly limited to the wet season.

Local water wells are dug between 15 and 82 meters depth. There is no groundwater situated within the 100 meters radius at any well site.

Soil - three orders soil are found in Suai - Entisols, Alfisols, and Utisols. The proposed well locations are predominantly entisols with sub order fluvents along the flat area towards coastlines. Soil profiles from proposed well locations can be seen in geotechnical sub section. Soil textures in the flat area including areas of the well sites are dominated by Loam and Sandy Loam with land slope between zero and ten percent. The soil is generally Alkaline with pH between 7.5 and 8.5 and it prone to medium and high risk of the Iron and Zinc deficiency (MAFP, 2015).

On the other hand, study conducted by WorleyParsons that soil textures around the Suai Supply Base (SSB) area mostly Sandy Clay and Gravelly Sand within 0 to 1.5 meters depth with the Clay found at various depth of the test pits, which appears to vary from the low to the medium plasticity. So, the construction designs will have to consider the potential impacts of the soil expansion and shrinkage (WorleyParsons, 2012a). Additionally, different study conducted by the Seed of Life (SoL) in 2006 in Beco, Oebaba and Zumalai showed the soil textures in the area referred were Silty Clay and Clay.

- **Lafaek** - soil textures at various depth between surface and 1m showing the soils are predominantly Silt with fine Sand and Silt with little Sand. The Silt soil is light, well drain, hold moisture well and high fertility rating.
- **Raiketan** - similarly soil texture at different depth between surface and 1m are mainly Silty fine Sand and Sandy Silt with fine to coarse and well graded Gravel. The Sandy soil is very good for drainage system as it has a poor capacity to hold water, therefore this soil type is not suitable for the agriculture because it makes plants very hard to absorb water.
- **Karau** - subsurface conditions typically comprised medium plasticity clay with sand at the surface, becoming more variable below 1m zone of clay sand and sandy clay, with gravel encountered to the base of the bores. Around September 2019 soil were stiff to very stiff.
- **Kumbili** - subsurface conditions at the site composite various mixture of medium plasticity sandy clay and clay sandy.
- **Laisapi** - subsurface condition at the drill site comprise various mixtures of low to medium plasticity sandy clay and clay sandy with zones of sand and gravel sand.



Biodiversity, Flora and Fauna - transects were walked at each of the five locations and detail is provided of the biodiversity, flora, and fauna observed along each. Locations of the transects are shown on satellite images.

- **Biodiversity:** the immediate well site areas include secondary forest, agricultural production, private plantation and horticulture; whilst that recorded in the surrounding areas includes tropical deciduous forest, secondary forest, swamp forest, coastal forest, savanna, agricultural production area and state and private teak plantations. The existing natural resources at well sites have no critical habitat according to national legislation and per the Ramsar Site international agreement.
- **Flora:** Tree species observed in the well site areas include: Ceylon Oak tree (*Schleichera sp*), Sheoak/Ironwood trees (*Casuarina sp*), Jujube trees (*Ziziphus sp*), Acacia trees (*Acacia sp*), Palm trees (*Corypha Elata*), Bamboo (*Bambusa sp*) and Teak trees (*Tectona grandis*), White Teak trees (*Gmelina sp*), Manggo (*Mangifera sp*), Coconut (*Cocos sp*), Moringa trees (*Moringa sp*) and include horticulture plantation such as Papaya (*Carica Papaya*) and Banana (*Musa sp*). None are classed as threatened or with limited geographical expansion in accordance with IUCN Red List.
- **Fauna:** some IUCN Red List species were identified:
 - One (1) *Cacatua Sulphurea* is classed as critically endangered bird species (CR)
 - Five (5) classified as under threat of extinction (NT)
 - Ten (10) classified as limited in geographical expansion (rr)

The drilling activities will not cause significant negative impact to identified bird species within well sites because their distribution is categorised as widespread residence, i.e. they can move out to other locations when drilling activities are being carried out.

Land access and resettlement

None of the proposed drilling sites identified require any resettlement of people, although temporary alternative accommodation may be necessary at Raiketan if noise abatement measures are not adequate. All areas of cultural significance have been avoided. Land use and land access will include:

- Negotiations in good faith and in a respectful and reasonable manner.
- Consultation with landowners to obtain their consent. These consultations typically cover the impact and term of the proposed use or access, employment and business development opportunities.
- A community land use agreement, a resettlement and livelihood restoration plan, and agreements if displacement or relocation is required.



- Compensation and land rental with local landowners for land use in accordance with the Timor-Leste rates, as required by the Onshore Decree Law of Timor-Leste. Compensation payments are transparent and made in the presence of relevant community and government representatives or independent observers.

Economic - discussions were held with stakeholders such as Municipality Administrators, Sub-district Administrators, Chefe Sucos, Chefe Aldeias and Lia Nain. Secondary data was obtained from published data from Ministry of Finance, Ministry of Agriculture and Ministry of Health, in addition to the World Bank East Asia & Pacific reports.

According to the 2015 census, 58% of the population in Covalima are classified as living above international poverty line with indicator reference to the national price index 2014, however 42% earn less than \$40.45 per month which is below the line.

Again, based on the census (2015), 60% - 80% of the population have access to schools, energy, clean water, tile floors and production sectors. The biggest improvement is access to energy which shows 80% of total households have access to electricity compared to 30% in 2010. Even though the figures indicated an improvement in quality of the living, in contrast only 2% - 35% of the Covalima's population have access to luxury items such as air conditioning, refrigerators, computers, televisions and the internet.

The employment rate in Covalima is about 56.97% (2015 Census), which is higher than the national level 53.4%. The percentage of working age population 10 – 14, 15 – 59 and over 60 years old are in order of 51.28%, 38.37% and 10.35% respectively; and these percentages are equally distributed among men and women in Covalima. The unemployment rate also decreased for Covalima from 2.9% in 2010 to 2.46% in 2015

Social - Interviews were conducted in the area with stakeholders during the EBS with local government officials such as Municipality Administrators, Sub-district Administrators, Hospital Management, PNTL Commander, Chefe Sucos, Chefe Aldeias and Lia Nain. The objectives of the interviews were to obtain the local information and data for the following social components: population and communities, health profiles, existing institutions, schools and health facilities, community and family structure and land and property owners and other common or individual rights.

Timor-Leste has quite diverse of cultures and languages of its population living across the country. The area of the country is 14,954.44 km², which has a total population of 1, 241, 506 recorded in census 2015 (Ministry of Finance), with a population density of 83 per km². The country has thirteen districts or Municipality divided into Post Administrative, Sucos and Aldeias. Covalima has a population of 67,495 inhabitants (Census 2015), an area of 1,206 km² and a population density of 55.9 per km².



Four languages are spoken in the Covalima area including Tetum Prasa, the mother tongue of Timor-Leste and the other three languages that belong to the area - Bunak, Tetum Terik and Kemak. Majority of the population (31,296) speak Bunak, followed by Tetum Terik, (25,925) Tetum Prasa (4,290) and Kemak (3,241).

Literacy in Timor-Leste is considered to be one of a major challenges, census 2015 indicates that it actually increased from 79.1% in 2010 to 84.02% in 2015 for population age 15 to 24 years old. The percentage of literacy in Covalima is even higher, the literacy recorded in 2010 was 81.1% and increased to 87.67% in 2015. The literacy rate for the population over 15 years old in Covalima requires more development, as of 2015 census the percentage of literacy for this age range is 63.5%.

Cultural - Interviews were conducted in the area during the EBS particularly with Lia Nain and local government officials, to identify any cultural components which may be impacted by the proposed project activities.

Cultural heritage sites were observed within the study area such as We Dare (Abad Laran) sacred site which is located 1.6 kilometre from Kumbili well, a sacred mountain (Foho Lulik), a sacred water spring (We Matan Lulik) approximately within 650m and 1.3km from Raiketan well, and We Fesawa a sacred site located 5 kilometres from the Laisapi well.

1.5 POSITIVE AND NEGATIVE IMPACTS

Timor Resources presence has the potential to have positive and negative impacts on the day-to-day lives of project area communities. The major benefits from a successful exploration drilling project could include increased employment opportunities for local communities both direct and indirect, improvement in livelihood of the communities, and increased revenue for the local area. In addition, the multiplier effect on the domestic economy will be substantial, by way of import duties, WHT's, as well as the potential revenue stream that would be created post any discovery for Timor-Leste by way of royalties, petroleum taxes and state participation by ANPM and Timor Gap E.P.

The impact assessment technique used determines that most identified impacts are classed as having a "Moderate" significance level which are reduced to "Minor" on the application of mitigation measures. Those identified as "Minor" were subsequently reduced to "Negligible" on application of residual measures. The singular exception relates to a catastrophic oil spill which would result in a "Major" impact, that is, potentially long term and affecting a larger regional area beyond the site, this mitigated by the implementation of an oil spill contingency plan and the emergency response and incident management plans, reducing the impact to "Moderate".



Positive impacts include:

Employment - 150 -180 positions will be filled by Timorese nationals during the drilling campaign. There will be a combination of skilled and unskilled positions, in the drilling crews, civil construction crews, geological teams, security teams, catering and services for the drilling contractor as well as a host of unskilled positions for labourers, cooks, cleaners and administration staff.

Employment opportunities will be advertised, and the unskilled positions will be filled by the recruitment of the local community.

Skilled positions will be filled from domestic and international markets, with a bias towards on the job training to capacity build and increase skills of the domestic work force, in our efforts to facilitate the employment of Timorese nationals.

The locally experienced workforce will be competitively recruited to work alongside expatriates during the Drilling campaign and there will be training for the “shadow program” whereby Timorese persons can learn on the job skills, to be eligible to take over from an expatriate employee, when the level of competency has been achieved that allows for the national worker to productively contribute to the work program in the drilling crew.

CSR programs

Timor Resources has implemented a number of CSR programs, including horticulture that is now well established. Acreage of land owned by farming cooperative group has been gifted seeds, irrigation and financial support to increase their capacity to grow commercial crops. This reduces poverty, increase food nutrition for the community at large.

Additional CSR program to supply irrigation and water infrastructure on the South Coast for the local communities, has been the focus of the Company during seismic and is intended to continue during the drilling campaign.

Support for the local sporting competitions, teams and local events is a CSR contribution Timor Resources intends to continue. The sponsoring of the Manufahi Cup, the Tour de Dili, the local community football and soccer federations.

During drilling there is the expectation that US\$110,000 will be spent on CSR initiatives directly associated with the contract area.

Grievance management

Providing effective channels for expressing and resolving grievances and concerns reduces the risk of escalation and ensures we address community concerns appropriately.



Community members can raise matters at any of our sites through the local community liaison officers or during routine visits by our Community Affairs team. We record the grievance centrally, assess it for potential risk or impact, and elevate or respond to it accordingly. Material grievances are reported to the senior management team. This approach ensures grievances relating to our activities can be raised easily and in a culturally appropriate manner.

Impact management

The project will have a significant multiplier effect for the community and the Country at large. The positive impacts are identified as employment, consumption of local goods and services, paying of local taxes and import duties as well as the benefit of the CSR program Timor Resources has and will continue to be undertaken during the project.

Timor Resources economy will attract spending onshore that exceeds US\$4.2million during this drilling campaign. These can be tracked and monitored under the following positive impact categories.

The residual negative impacts are:

Traffic - An increase in traffic may create a nuisance and potential impact on the safety of other road users. Limited number of locations and roads, short program and transient nature of the project limits potential effects.

Soil - Removal of topsoil and soil compaction will occur largely during the construction phase, the effect will continue through operations until sites are decommissioned and rehabilitated.

Air Quality - during construction a decrease in Air Quality from dust may cause nuisance and impact on the fauna and flora around the project site. Short construction program, low levels of diesel usage limit impacts.

Gaseous emissions during rig operations may create a nuisance and minor impact on the fauna and flora around the project site. A short drilling program (30 days per well) and low levels of diesel usage in the region 5000L/day or 150 tonnes diesel per well limit impacts.

As in the construction phase, dust may cause a nuisance and impact on the fauna and flora during decommissioning, but this again will be temporary. Short decommissioning period, impacts are considered short term and transient.

Solid Waste - by the nature of the project, solid wastes will arise, waste management will provide the best available solution for waste management, however, the principal method of incineration will result in emissions to the atmosphere. Also, by nature of the project



such emissions will be short term. A Waste Management Plan (WMP) will be developed and will take into account the existing elimination processes for treating or eliminating, partly or fully, all waste generated by the project.

Noise - drilling operations will be conducted on a 24 hour, 7 day per week basis so may cause a nuisance for local communities and wild life, but the duration is less than 30 days, thus is short term and transient.

The results fully reflect that the project is limited spatially to the drilling location and immediate surrounds and is short term and transient in nature, thus, there is limited potential to cause any permanent or significant impacts. These negative residual impacts are considered inconsequential compared to the benefits generated.

1.6 PUBLIC CONSULTATION

Timor Resources and Safety Management Consultancy (SMC), as facilitator, presented to local communities in the areas where the five well sites are located. The participants included local community leaders such as Chefe Suco, Chefe Aldeia and local youth groups, also representatives of local authorities such as District Administrator, Sub District Administrator and Vice Commander of Police.


TR provided details of the project such as the location of the drilling sites, well depth, equipment used, infrastructure involved, legal basis, local content, the potential effects of activities on communities and the surrounding environment, followed by question and answer sessions. The consultations were carried out at the following communities, participation was positive.

- Date: Monday, 21 October 2019, Location: Camenasa Community Hall

Attendance: ANPM - SMC team, TR team, Local community leaders of Camenasa: Chefe Suco, Chefe Aldeia, Oficiais Policia Comunitaria (OPS) and Cultural leaders of Holbelis; Local Authorities: Representatives of Municipio Administração Estatal (MAE), Segundo Commandante PNTL, other members of PNTL. Total Participants: 97 participants. *Consultation Commenced at 9:00 am to 12:30 pm*

- Date: Tuesday 22 October 2019 Location: Belecasac Community Hall

Attendance: SMC team, Local Community leaders of Belecasac-Chefe de Suco and Chefe villages Representative of Local Authorities- Representative of the District Administrator Sub District Administrator of Maucatar, Representative of Local Youth Group, Vice Command of Police, Local Community – Total 89 participants. *Consultation Commenced at 9:00 am to 12:30 pm*

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- Date: Wednesday, 23 October 2019 Location: Matai Community Hall

Attendance ANPM – SMC team and 9 other members, TR team, SMC team, Local Community leaders of Matai-Chefe de Suco and Chefe villages Traditional leaders. Representative of the Local Authorities- Agriculture, Environment Representative of the District Administrator, Sub District Administrator of Maucatar, Representative of Local Youth Group, Local Police Commander, Local Community – Total 135 participants. *Consultation Commenced at 9:00 am to 12:30 pm*

- Date: Thursday, 24 October 2019 Location: Labarai Community Hall (Detail attached)

Attendance: ANPM – SMC team and 9 other members, TR team, SMC team. Local Community leaders of Labarai: Chefe de Suco and Chefe villages Traditional Leaders, Representative of the Local Authorities- Agriculture. Representative of the District Administrator, Sub District Administrator of Suai, Representative of Local Youth Group, Local Veterans, Local Police Commander, Local Community – Total 132 participants. *Consultation Commenced at 9:00 am to 12:30 pm*

- Date: Friday 25 October 2019 Location: Community Hall of Tashilin


Attendance: Representative of the Local Authorities - The District Administrator, Sub District Administrator of Suai. Representative of Local Youth Group. Local Veterans, Local Police Commander, OPS and Local Community – Total 89 participants. *Consultation Commenced at 9:00 am to 12:30 pm*

1.7 ECONOMIC ASSESSMENT

Procurement of Goods and Services - procurement from Timorese owned and operated businesses in the contract area goods and services include but are not limited to;

- Fresh Food and water \$477,040
- Accommodation Housing/Office Supply \$186,000
- Diesel Supply \$1,050,000
- Import Services for customs clearance \$62,000
- Rental of Heavy Equipment, trucks, cranes \$190,000
- Environmental Consultancy Engagement \$190,000
- Aggregate and rock base \$140,000

In preparation for the local suppliers to be able to offer their goods and services Timor Resources has undertaken promotional workshops and engagements to educate the local suppliers as to what they can supply and in what quantities they can participate. Raising

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the standard of the local suppliers, to be able to participate in the tender process and to be a supplier has been an activity undertaken over 18 months already in working with the communities and the local district administrator, in preparation.

Customs Duties and taxes - Imported equipment will net greater than US\$350,000 in import duties alone, as heavy equipment comes into the country. WHT will be payable and collected on the employment and contracts, providing revenue to the state exceeding US\$520,000.

Cost and Benefit of Environmental Mitigation Measures - A broad estimate of costs related to “environmental” impact mitigation can be summarised as follows:

- High cost capital equipment items such as blow-out preventers, diverter, emergency valves the flare line at \$3,400,000
- Pressure and flow monitoring equipment \$1,900,000
- mud chemicals which provide a key “barrier” down hole balancing downhole pressures so removing the risk of over-pressure and a blowout \$400,000.
- Permitting, approvals, certification, training costs for personnel \$1,220,000
- Environmental studies and monitoring \$500,000
- Local spend - Community and cultural, education, inclusion employment, procurement of goods and services, community relations, information sharing, celebrations, local sponsorship, land and surface leasing fees. \$1,550,000
- Civil construction planning equipment rental \$1,960,000
- Decommissioning, Reforestation, removal of civil constructed sites, monitoring, reporting \$880,000

1.8 CONCLUSIONS AND RECOMMENDATIONS

Mitigation measures have been proposed for all the residual impacts identified aimed at protecting the physical, biological, and socio-economic environments. An Environmental Management Plan (EMP) has been developed to manage the potential impacts of the proposed activities and ensure that they remain at acceptable levels throughout the course of the program.

The EIA process has identified that the project is limited spatially and is short term and transient in nature with limited potential to cause any permanent or significant impacts. The negative residual impacts are considered inconsequential compared to the benefits generated, hence, the Environment Authority is requested to license the project.

The project is viable subject to the EMP being followed and complying with all other statutory requirements that the project subscribes to.

Key recommendations are as follows:



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1. Implement a Redress and Grievance Procedure that will be used throughout the project.
2. The Community Liaison Officer will maintain continuous engagement with all stakeholders and keep communities informed at all stages of the project in regard to activities, schedules and potential impacts.
3. All activities to be conducted in compliance with Timor Leste laws including but not limited to: Law No.3 2012 - Legislative Authorisation in Environmental Matters; Law No 26 2012 - Environmental Basic Law; Decree-Law No.18/2020 - Onshore Petroleum Operations.
4. All activities to be conducted in compliance with Timor Resources HSE policy and Operating Management System Standards.
5. Consult with local administration and security agencies for support on security issues.
6. Liaise with the local community during the recruitment process.
7. Implement a Waste Management Plan and agree waste management practices and facilities in consultation with the Municipality.
8. Wastes should only be transported by an approved waste transporter agreed in consultation with the Municipality.
9. Implement a Traffic Management Plan and enforce traffic speed limits to minimise dust generation.
10. Make use of the existing access roads to the maximum extent possible.
11. Minimise vegetation clearance.
12. Prepare Rehabilitation Plans for each location.
13. Implement Noise and Air Quality Management Plans.
14. Implement Incident management system: Crisis Management Plan - Corporate, Incident Management Plan - National, and Emergency Response Plan and Oil Spill Contingency Plan - local.



2 DETAILS OF THE PROJECT PROPONENT

2.1 CONTACT DETAILS

Operator : TIMOR RESOURCES
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2.2 COMPANY STRUCTURE

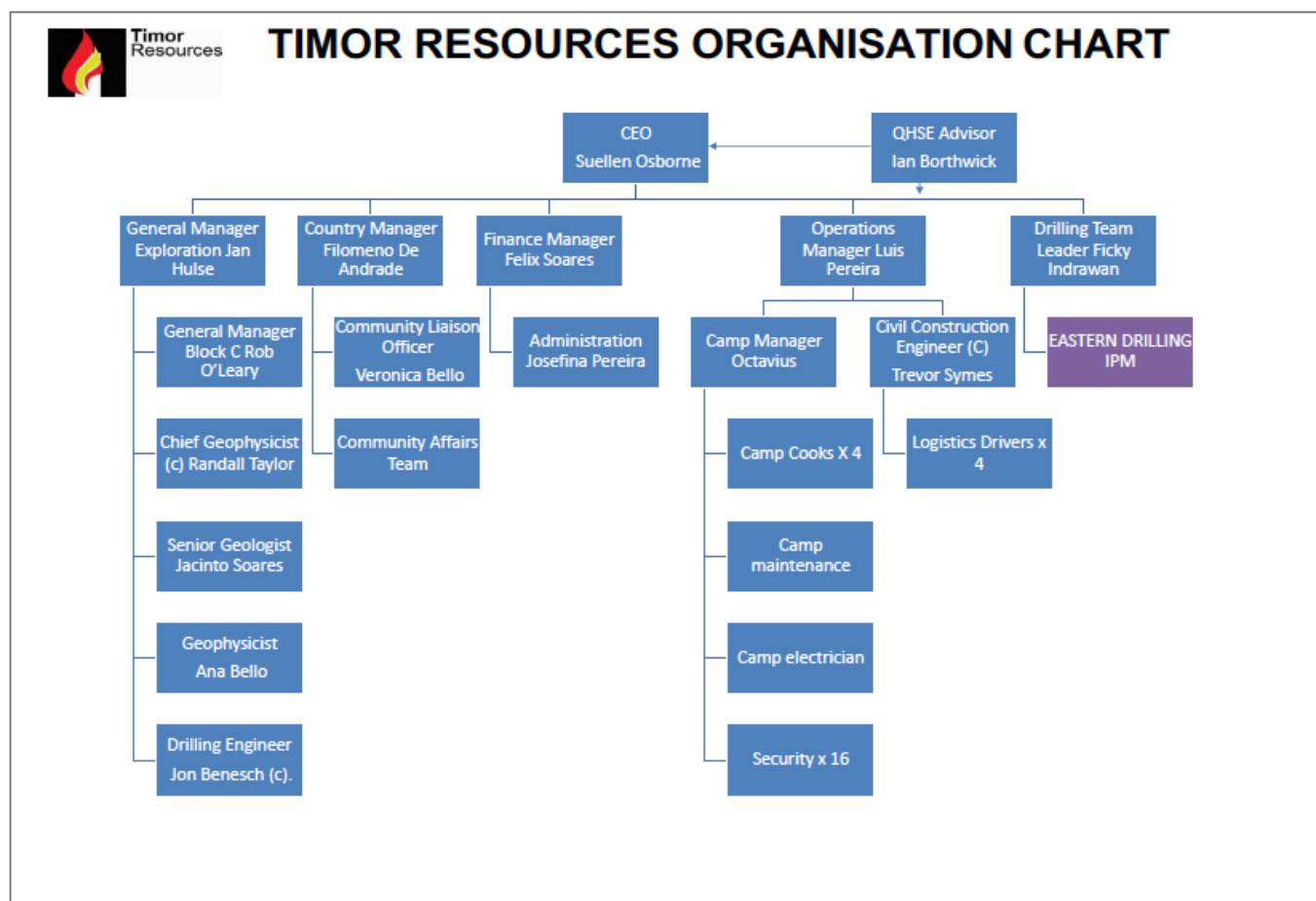



Figure 1 - Timor Resources organization structure

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3 DETAILS OF CONSULTANT WHO CARRIED OUT THE EIA

SAFETY MANAGEMENT CONSULTANCY (SMC) Lda.

Address : Rua de Catedral, Villa-Verde, Dili, Timor-Leste

Telephone : +670 7565 7185, 7740 4533, 7337 4141

Email : info@smc-tl.biz or alcino.pasos@smc-tl.biz

Consultants:

1. Alcino dos Santos Passos

Has experience more than 10 years in oil and gas industry, especially in the area of production and development. Alcino hold Bachelor Degree in Electrical and Electronic Engineering and he was Manager of Production and Development at ANPM under Directorate of Development and Production (D & P) and was responsible for production, maintenance, drilling and metering.

2. Jose Azelito Soares

Has experience more than 10 years in oil and gas industry, he has Bachelor Degree in Law and Master Degree in International Energy Policy and has completed PhD coursework in International Energy Policy. Jose Soares was Legal Manager at ANPM for two years and that time he was responsible for legal and policy development as well as PSC contract arrangements.

3. Zelio Moniz

Has experience more than 16 years in oil and gas industry and was the Health and Safety Inspector of the ANPM, under directorate of the Health, Safety and Environment (HSE). He holds Diploma in Health Science and was responsible for ANPM HSE audits or inspections, incident/accident investigations, risk management and HSE performance measurements.

4. Salvador da Silva

Has experience in the oil and gas industry for more than 5 years. He was Local Content and PSC Procurement Officer, who was responsible for review the contract arrangements, local content plans, PSC procurement and supply chain contracts. Salvador has Bachelor Degree in Biochemistry and was also Local Content and Community Liaison Officer for Timor Resource.

5. Palmira A. Vilanova

Has 10 years of experiences of safety, environmental and social management in various disciplines, include oil and gas industry. She has a Bachelor of Science degree in Natural Resources and Environmental Management and a Master of Science degree in Project Management. She has been working as an Independent Consultant for Asia Foundation and latest experiences as Country Consultant for UNCCD (United Nations Convention to Combat Degradation).

6. Adriano P. Cardoso Amaral


Fresh graduate from Victoria University of Wellington majoring in Geology and Environmental Science; with a first working experiences as an geologist and Geophysics intern with ANPM. The latest working experiences as Environmental and Geology consultant for SMC (Safety Management Consultancy).

7. Evangelita Pereira

Has 6 years of experience working as Health and Nutrition Technical Specialist. She has been working with international NGOs implementation of quality health programs according Timor - Leste standards. She holds Bachelor of Health Sciences (Hons).

8. Pedro Pinto

Has 20 years of experience as Ornithologist. He has been working under Indonesian and Timor - Leste governments for Flora and Fauna Conservation. He holds a degree in Bachelor Science of Forestry.

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4 DESCRIPTION OF THE PROJECT

4.1 SUMMARY OF THE PROJECT

After interpretation of the 2018 Fafulu 2D seismic survey five promising geological structures were identified. In order to confirm the presence, volume and deliverability of hydrocarbons it is considered necessary to drill exploratory boreholes.

Wells that are drilled to discover existence hydrocarbons are termed “Exploration” wells. The location of a drill site depends on the characteristics of the Rig equipment, the well design, and surface conditions. The location selection criteria described in this report demonstrate a balance between environmental protection, logistical requirements, and the technical factors for successful drilling.

A well pad is to be constructed at each of the five sites to accommodate drilling equipment and support services; each pad occupies approximately 1 hectare. The entire location is cleared of all vegetation and topsoil prior to the start of any civil works. The vegetation and topsoil are stockpiled in a cleared area within the drilling location but outside the work area. A perimeter drainage ditch and berms are constructed around the location for containment and management of surface water. The well site incorporates two mud pits each with a volume of approximately 334 m³ (2,100 bbls), a freeboard of 0.5m and lined with a High-Density Polyethylene (HDPE) membrane liner. All new access roads will be constructed on compacted sub-grade to form a road base 6 m wide, within a clearance corridor of 10 to 20 m.

The drilling rig and support equipment are split into modules and are shipped into Suai directly where the rig will be moved to the first location and assembled. Equipment and materials not required for the start of the first well will be moved to a staging area at Haemanu Camp. Typical drilling rig modules include the derrick, sub-base, mud tanks and pumps, power generators, cementing equipment, mini-camp, and tanks for fuel and water (Figure 2). The mini-camp provides on-site accommodation for the senior drilling management, communications, vehicle maintenance and parking areas, fuel handling and storage areas, and provision for the collection, segregation and disposal of waste and recyclable materials.

The main support camp is located at Haemanu (formerly a Covec road construction camp) in the approximate centre of the drilling area. This provides accommodation for the off-duty workforce, canteen facilities and provision for the collection, segregation and disposal of waste and recyclable materials.

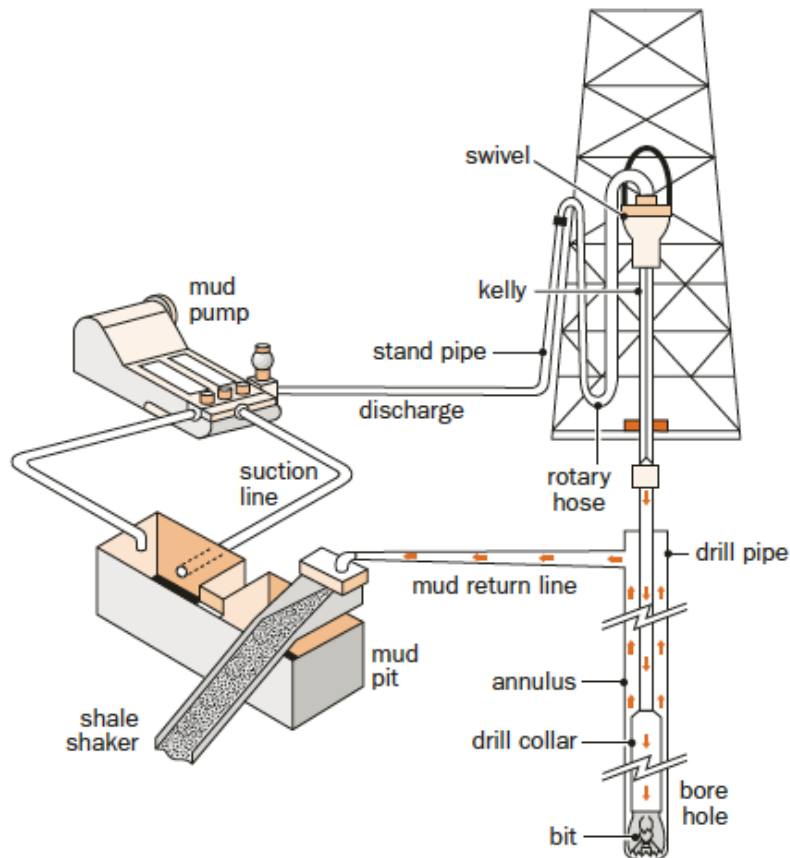



Figure 2. General Configuration of Onshore Drilling Rig

Once drilling commences, drilling fluid or “mud” is continuously circulated down the drill pipe and back to the surface equipment. Its purpose is to balance underground hydrostatic pressure, cool and clean the bit and flush out rock cuttings.

The risk of an uncontrolled flow from the reservoir to the surface is greatly reduced by using blowout preventers - a series of hydraulically actuated steel rams that can close quickly around the drill string to seal off a well.

Steel casing is run into completed sections of the borehole and cemented into place. The casing provides structural support to maintain the integrity of the borehole and isolates underground formations, particularly the shallow aquifers found up to 88 m below ground level in this area.

Drilling operations will be conducted around the clock. The time taken to drill a bore hole depends on the depth of the hydrocarbon bearing formation and the geological conditions and is expected to be in the order of 30-50 days. Where a hydrocarbon

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formation is found, initial well tests, lasting up to a month, are conducted to establish flow rates and formation pressure. These tests may generate oil, gas and formation water, each of which will be managed on site.

If the exploratory drilling has discovered potentially commercial quantities of hydrocarbons after drilling and initial testing, a wellhead valve assembly will be installed.

If the well does not contain commercial quantities of hydrocarbon, the site is decommissioned to a safe and stable condition and restored to its original state or to a state as agreed with landowners and approved by the appropriate authorities. Open rock formations are sealed with cement plugs to prevent upward migration of wellbore fluids. The casing wellhead and the top joint of the casings are cut below the ground level and capped with a cement plug. After securing the hole the rig is dismantled and moved to the next site.

4.2 IDENTIFICATION OF THE PROJECT

This project is to conduct exploration drilling of up to five identified well locations, namely Karau, Kumbili, Lafaek, Laisapi and Raiketan. These wells are located in sub districts of Suai, Maukatar and Zumalai in Covalima municipality. The exploration drilling is planned to commence in Q4 2020 or early 2021, subject to easing of restrictions imposed due to Covid-19 pandemic.

These five wells were identified as a result of prospect evaluation carried out by Timor Resources exploration team which ultimately defined the targeted plays to be drilled.

4.3 PROJECT CATEGORY

The drilling activity has the potential to have significant environmental impact, thus the drilling activity was defined as Category ‘A’ according to Article 4, 1a and Annex I of the Decree Law No. 5/2011 of Environmental Licensing. Therefore, Timor Resources is required to submit a Terms of Reference (ToR), Environmental Impact Statement (EIS) and Environmental Management Plan (EMP) seeking approval in order to gain an Environmental Licence to allow for drilling to commence.

Regulatory approval of oil and gas development projects is undertaken by the ANPM under Decree-Law 5/2011 Environmental Licensing, with Reference to Decree Law No 27/2020 dated 19 June Organic Law of VIII - Constitutional Article 33 (c) (Minister of Petroleum and Minerals) item (o) mandating MPM and ANPM to administer the environmental licensing process in the petroleum sector.



4.4 BRIEF DESCRIPTION OF NATURE, SIZE AND LOCATION OF THE PROJECT

4.4.1 Nature of the Project

The exploration drilling activities will be conducted in three phases, Pre-drill, Drilling and Suspension or Abandonment.

The drilling program is designed to test three play types within the area of PSC TL-OT-17-08, which are:

1. The Pliocene-Pleistocene age Viqueque Formation, syn-orogenic Basin.
2. Lower Allochthon (Permian-Eocene)
3. The Triassic-Jurassic age Babulu/Aitutu and Wai-Luli Formations beneath a regional metamorphic overthrust.

The above plays are to be tested with up to five wells. The proposed locations are situated between the Suai and Zumalai areas at a distance of 700-7000 meters inland from the coastline.

The drilling locations are provided in Table 1 and Figure 3. Note that the technically recommended location for Lafaek and Raiketan were revised, based on surface conditions and infrastructure, to minimise disturbance by civil works and reduce the impact on the environment. Raiketan-1 technical best location is sited in the Raiketan river course, it is unlikely to be able to achieve all the technical objectives from a suitable offset location so is being reviewed.

Table 1. Well Locations, subject to final survey of actual hole centre

Well	Karau	Kumbili	Lafaek	Laisapi	Raiketan
Seismic Line	Fafulu12	Fafulu14	SBT07	Fafulu17	Fafulu07
Easting (UTM 51S)	749182	754049	751730	768594	752700
Northing (UTM 51S)	8969941	8970568	8972766	8979648	8975602
Latitude	-9.31123	-9.30527	-9.28554	-9.22234	-9.25986
Longitude	125.26847	125.31272	125.29149	125.44448	125.30014
Drill Floor (mGL)	5.33	5.33	5.33	5.33	5.33
Ground Level (mSS)	-33	-16	-48	-16	-79
Total Depth (mMD)	1039	1471	2909	1771	1947

In addition to the proposed wells location, a “Drilling Fairway” area was defined in the TOR. This is in order to maintain flexibility within the drilling campaign for follow up Appraisal drilling in the case of a discovery.

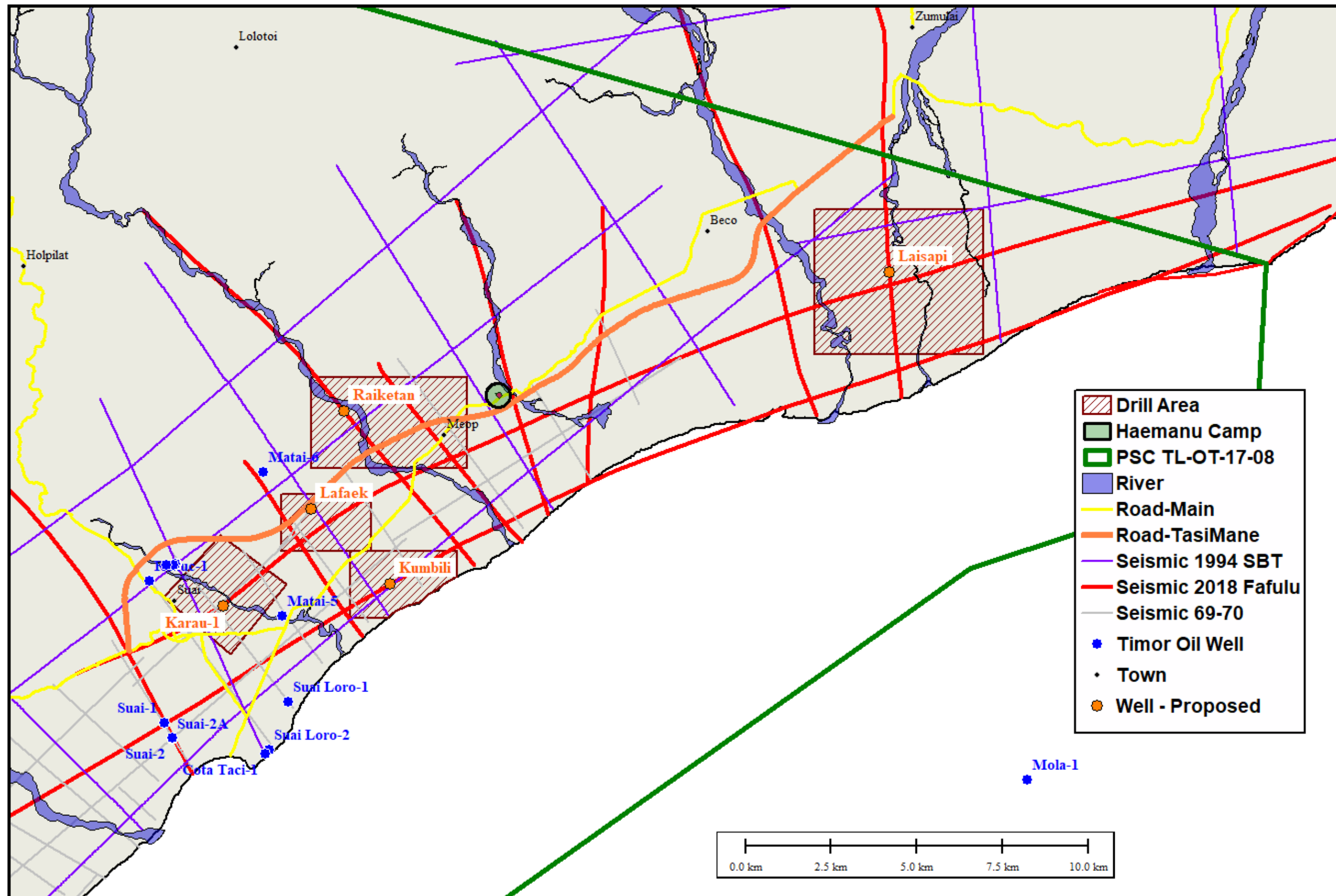



Figure 3. Location of Proposed Wells, Haemanu Base Camp and Infrastructure

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4.4.1.1 Pre-Drilling Operations

Pre-drilling operations include:

(1) **Geotechnical, Geochemical and Topographic surveys**

These surveys are conducted to gain understanding of the topography and soil characteristics of well sites and road access to undertake site design planning and subsequent civil works.

Geotechnical surveys provide information on physical properties of soil which include structure, load bearing strength, and consistency. The geotechnical data is combined with geochemical survey results to determine environmental effects on soils, such as dispersion or expansion of clays. This data is used in planning of civil works, particularly for calculation of foundation requirements for the drilling rig and associated equipment and heavy vehicle usage on access roads.

Local topographic survey is carried out in the area of the proposed well sites to plan the earthworks requirements for each site and access. The survey is used to calculate levels and the amount of cut and fill required. Natural and man-made features are also identified by the topographic survey for the environmental plan.

The local topographic survey is combined with a semi-regional Digital Terrain Model to delineate natural drainage patterns by watershed analysis. This analysis allows for planning of diversion of surface water within and around the well site.

(2) **Land clearance for road access and site construction**

The arable top soil and vegetation is stockpiled on the side of the lease within the fence line or in the case of access corridors, to the side of the road. The top soil will be used to rehabilitate the site once drilling is completed in areas which are no longer required. Access roads will be 6m wide with 10 - 20m of clearance for wide loads.

River rock will be used as base course up to 30 cm in thickness for the access roads. The well site area of approximately 1ha will be levelled after top soil is removed and river rocks will be used as base course up to 50 cm in thickness. If the geotechnical survey dictates, additional foundation will be used under high load bearing areas. The well site designs for each location are shown in


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Figure 4 to Figure 6. Site design details are included in Karau Project - SOW Drilling Construction Rev B - 6 March 2020 (Timor Resources 2020a).

(3) Road and bridge surveys plan, including highway and arterial and local roads.

TR and ED have carried out extensive surveys on existing roads, bridges, and highways (Timor Resources 2020b). The new Tasi Mane highway has been designed and constructed using the AASHTO design code. Bridges and roads have been identified and mapped for the rig moves. All options have been reviewed for transportation; loads will be managed within the appropriate allowable road load capacity.


(4) Establish water supply

Daily water needs for drilling are estimated to be up to 60,000 litres per day. Water will be sourced from local contractors. Water storage tanks on site will be filled and a mud system mixed prior to spud of the well. The level of offtake from the water source will be such that it is not detrimental to the supply for other users. Where a flowing river or stream is close to the site this may be used as an alternative but will depend on seasonal variation. Saltwater is also a potential alternate for locations close to the coast, the mud system to be used is compatible with salt make up water but other considerations such as corrosion make it less desirable.

(5) Well Site

The typical well site consists of:

- Rig sub-base, carrier and derrick
- Mini camp and office: set of mobile units used for accommodation, mess, store room and support offices for engineers and meeting spaces.
- Septic field: a portable fibre glass for black water will be used for a biotreatment method of water filtration before it is channelled underground to a leach field.
- Mud pits for drilling fluid
- Mud pump station
- Flare pit for well test
- Cellar around hole centre
- Parking space
- Laydown area for casing and drill pipe
- Power Generator
- Perimeter Fence surrounding the well site

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The layout dimensions are specific for each type and model of rig but can be adjusted, within limits, to sites that are not of uniform shape. The base layout design for ED Rig#1 is 100m x 100m and has been adjusted to the orientation and restrictions of each location. See Timor Resources 2020a.

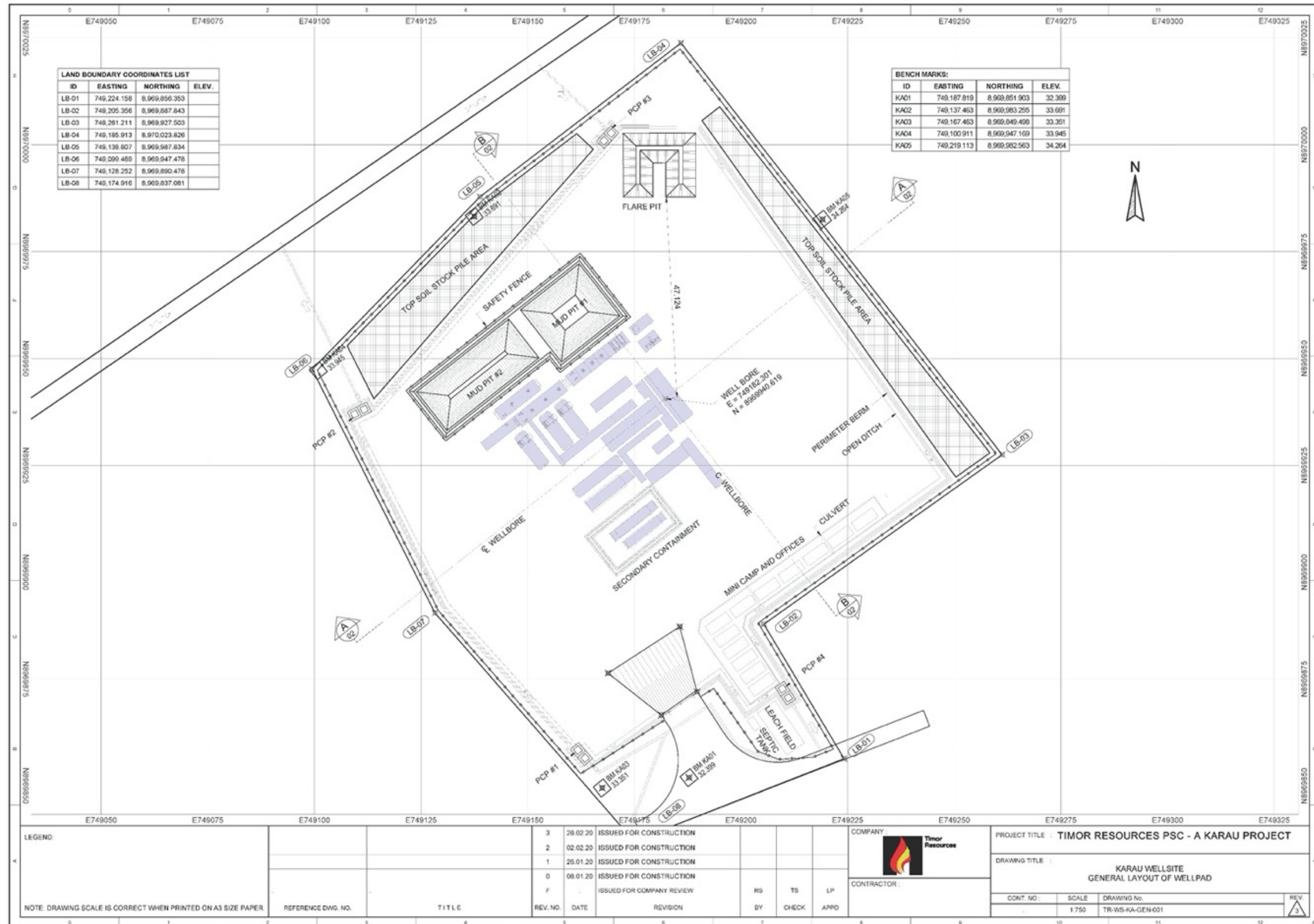


Figure 4. Karau Well layout
Access is via public road aligned with the southern limit of the area

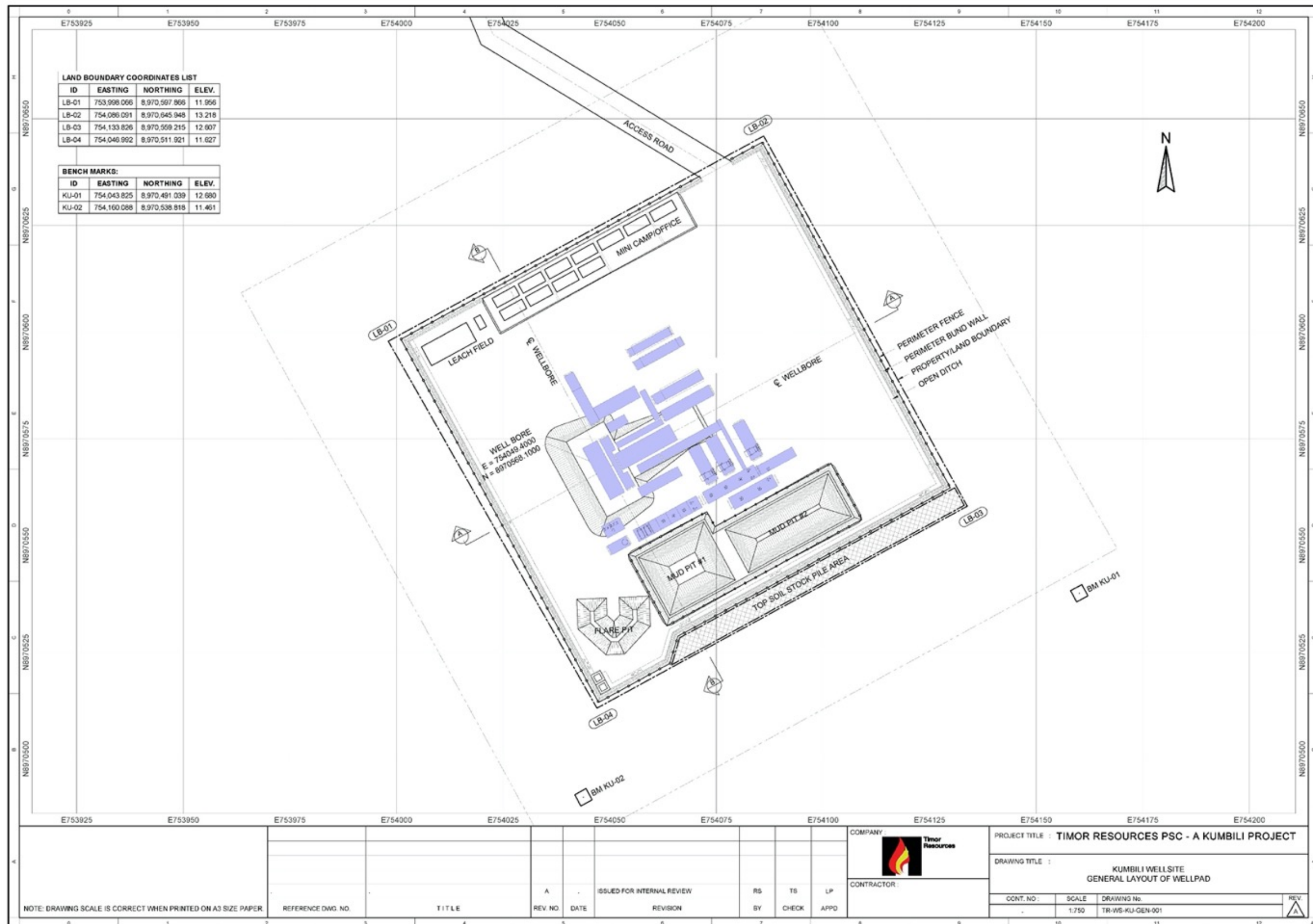


Figure 5. Kumbili Well Layout

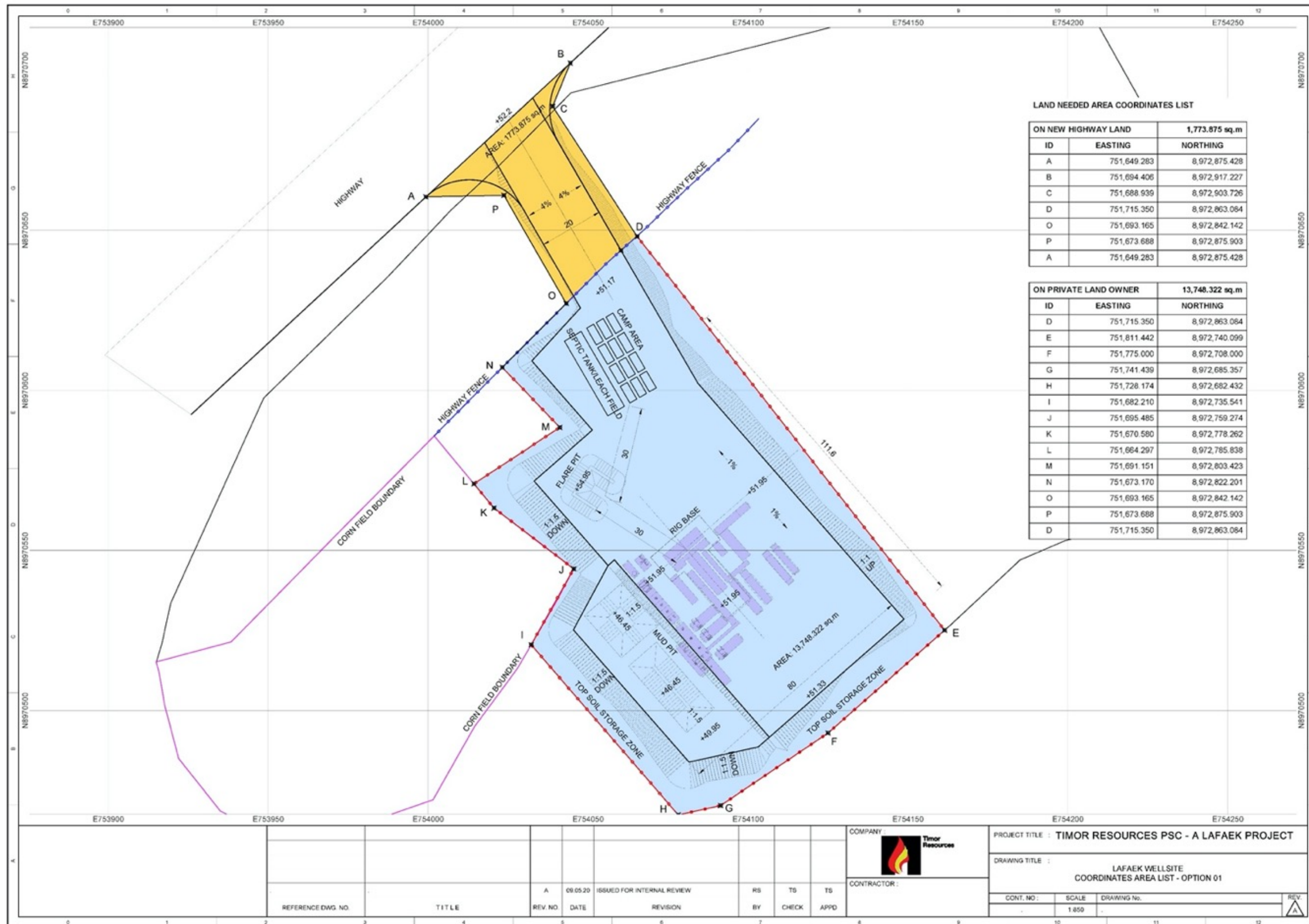



Figure 6. Lafaek Well Layout
Access is from the Tasi Mane highway to the north. Highway easement shown in yellow, private land in blue

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(6) Cellar construction with recess for air pump.

The objective of the cellar construction is to place BOP during the drilling operation. Ground preparation for cellar area will require 2.7 meters in depth. A plate steel and cement cellar with dimension of 2.9 x 2.9 meters will then be installed.

(7) Mud Pits (sump) construction

Two 3m deep mud pits with approximate dimensions of 18 x 20m and 14 x 30m will be prepared for mud handling and circulation. An impermeable geomembrane will be used in the pit as barriers to prevent soil contamination in case of any presence of harmful substance. The pits will be fenced off within the compound for safety reasons.

(8) Rig Move

Joint assessments were carried out by TR and ED for all possible routes to each well location. The assessment covered road width, intersections, bridges, community and public infrastructure. An assessment by TR, ED and transport contractors was carried out to determine the risks associated with rig move. As a result, roles and responsibilities were identified to assess and manage each rig move. The truck loads will not exceed 4.5 meters in height and 3.5 meters in width.

4.4.1.2 Drilling Operations

It is proposed to drill up to five wells with a cumulative depth of approximately 9,000m. The proposed well(s) designs are based on geological and geophysical data interpreted by Timor Resources and Timor GAP.

The Drilling operation will be conducted as per the well specific drilling programs as approved by ANPM. The procedures employed will be standard onshore oilfield best practice.

4.4.1.2.1 Pressure

An assessment of potential pore and fracture gradients is necessary for well control planning and protection of formation from damage. The formation pressure dictates the selection of BOP and surface control equipment pressure ratings and also the mud weights required to drill the well and maintain an over-balanced system. Excessive mud weights can cause the formation to fracture and losses of the mud system which could then result in underbalance and flow. Excessive mud weights can also cause invasion of potential reservoir sections and severely reduce deliverability.



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Pore pressure and fracture pressure predictions have been calculated using offset well and seismic data, specifically:

- Drill Stem Tests
- Reported mud weights for kicks, flows and losses
- Shut-in pressures, pipe and annulus
- Sonic, density and resistivity wireline logs
- Seismic Interval Velocity
- Modelled fracture and overburden gradients

The accuracy of pressure prediction is controlled by the available data. The offset well database is of variable quality and at times lacking in detail.

No Leak-off (fracture initiation pressure) or Formation Integrity (set maximum pressure) Tests were recorded for any offset wells, so the calculation of fracture pressure is limited to indirect means (predominantly modelling and wireline log data).

In order to optimise wellbore control, stability and integrity, a “best” and “high-case” estimate was calculated. As per standard procedure, these limits, respectively, are used to determine the drilling and kill mud weights for each interval.

The Pore and Fracture pressure (in mud-weight pounds per gallon - ppg) for the primary exploration locations are provided in Figure 7 – Figure 11.

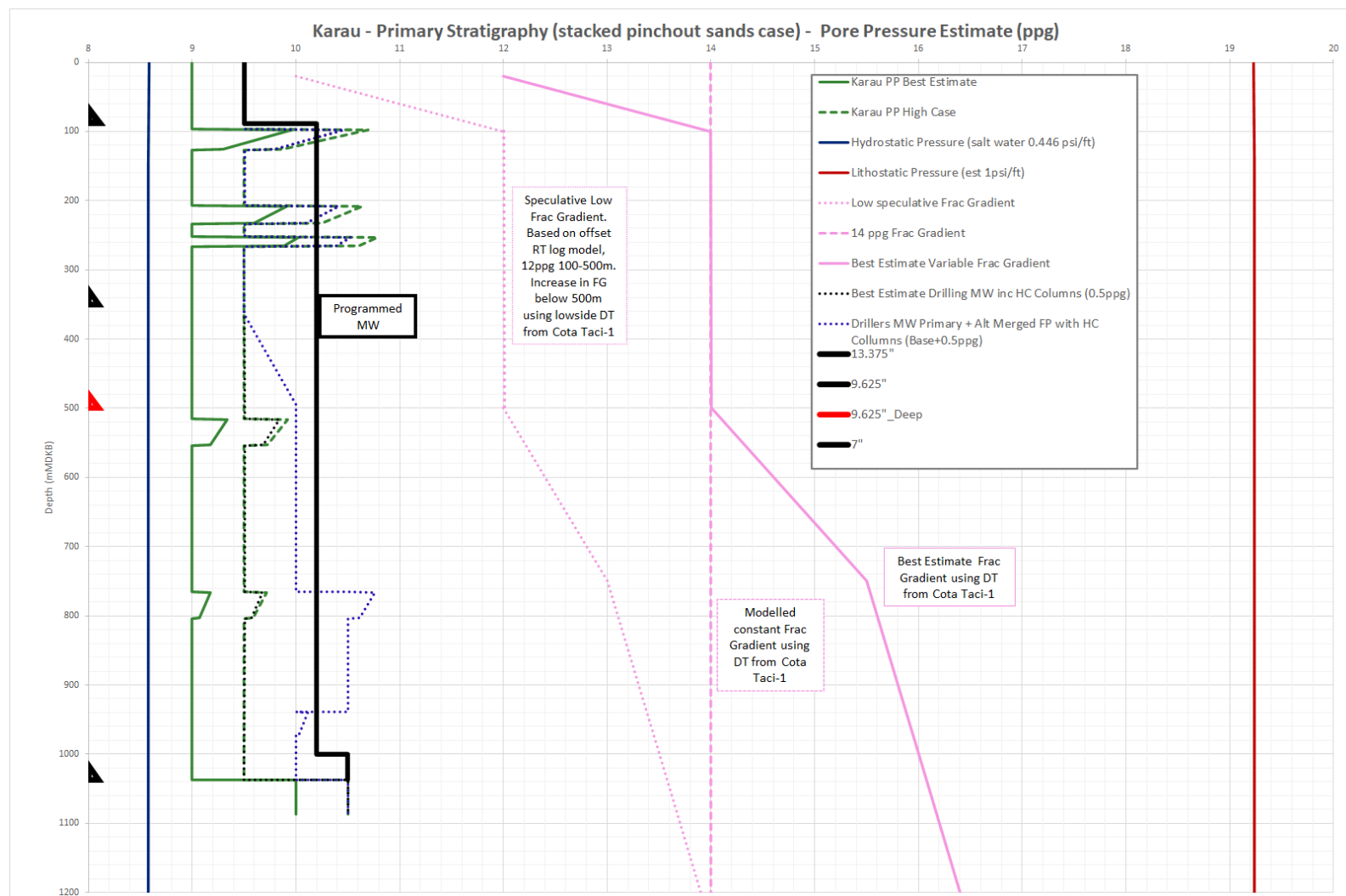


Figure 7. Karau-1 Pore & Fracture Gradient Prediction

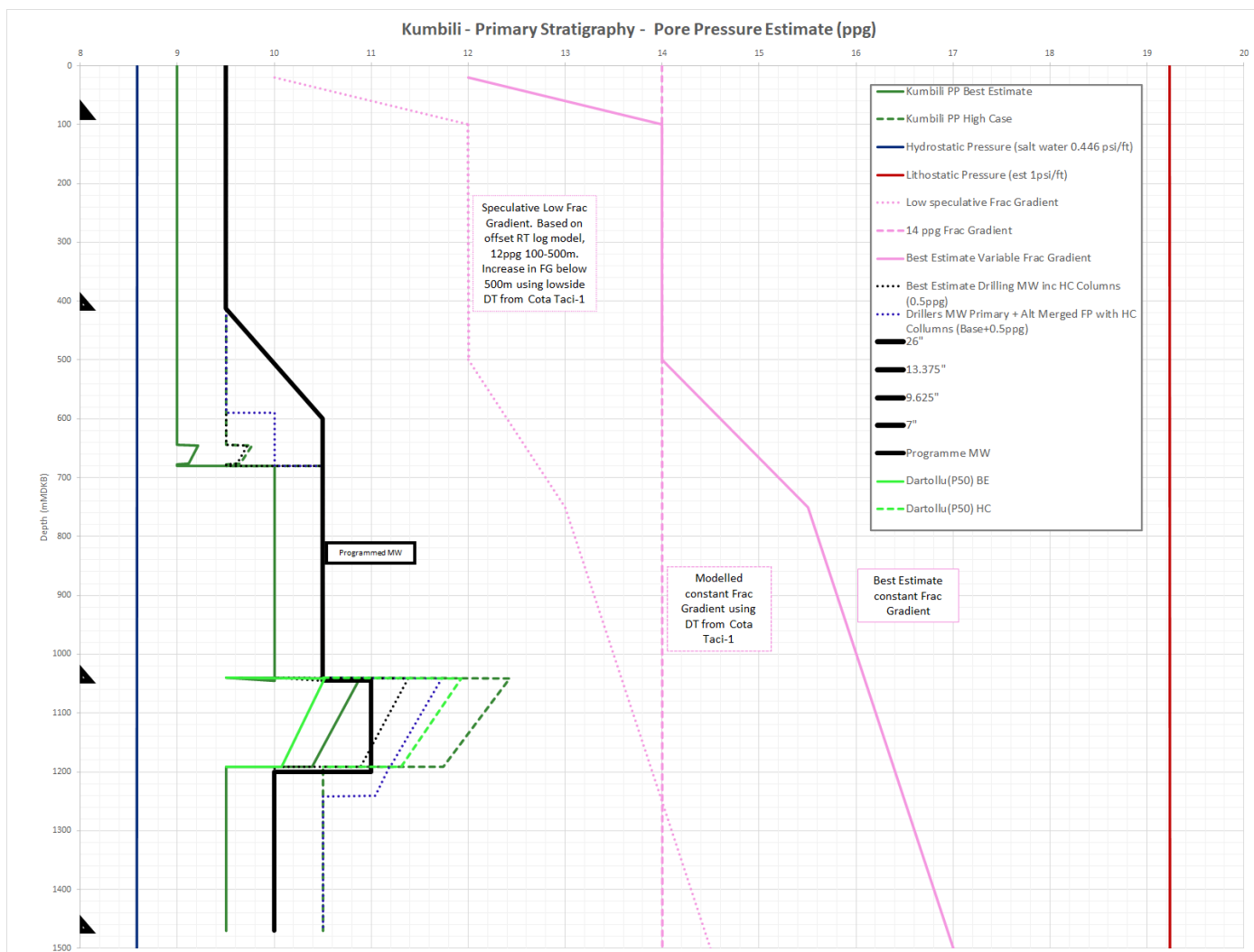


Figure 8. Kumbili-1 Pore & Fracture Gradient Prediction

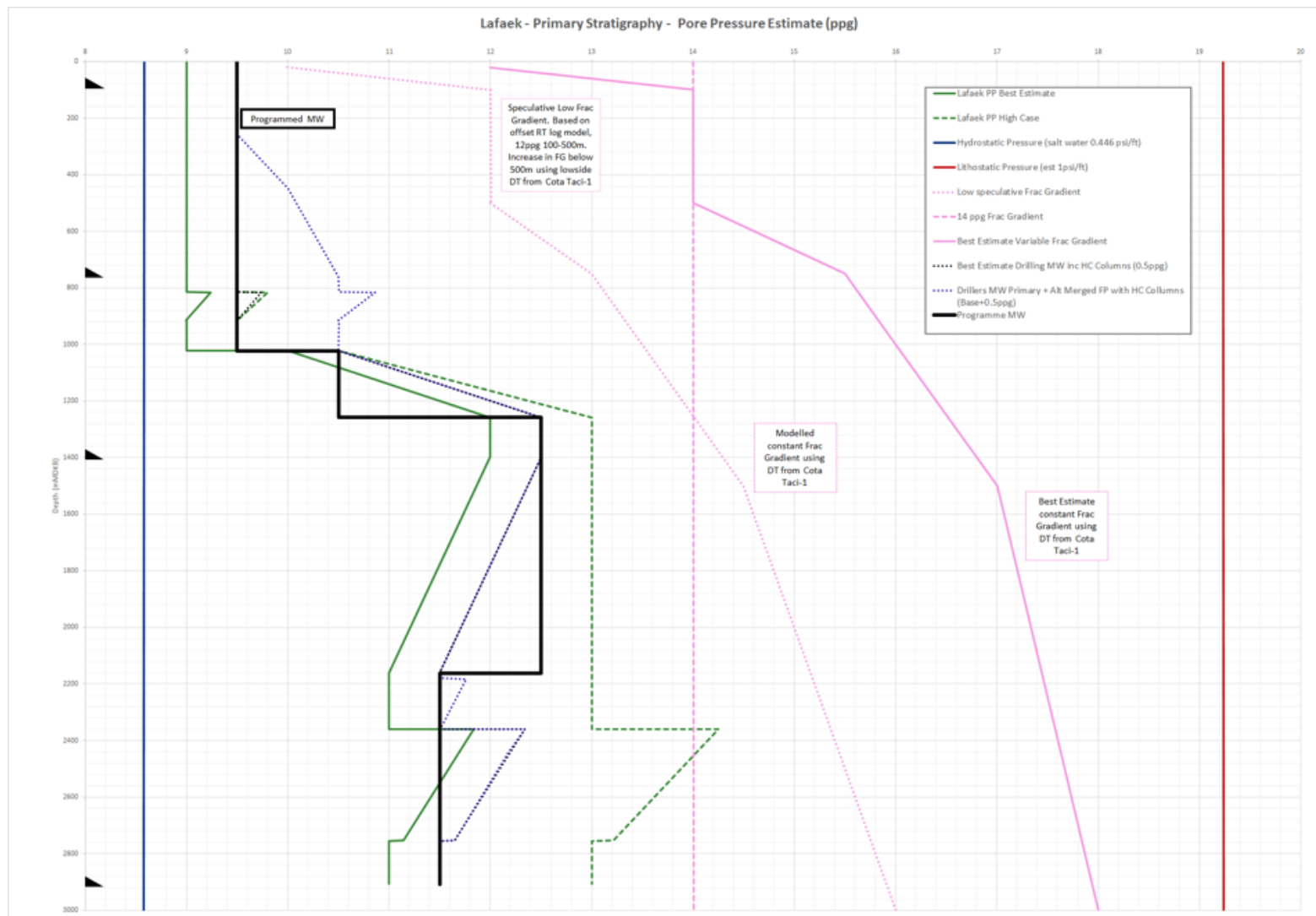


Figure 9. Lafaek-1 Pore & Fracture Gradient Prediction

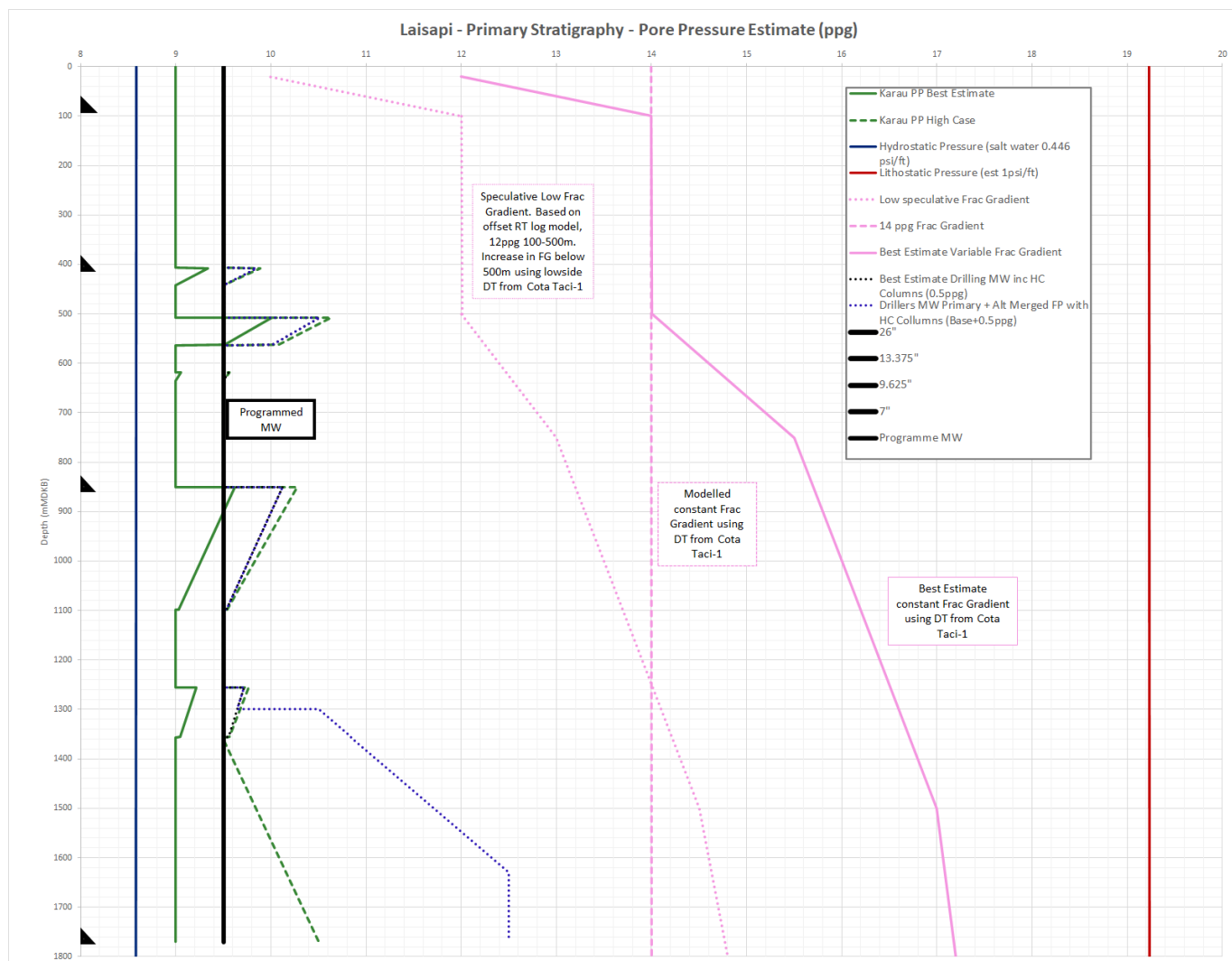


Figure 10. Laisapi-1 Pore & Fracture Gradient Prediction

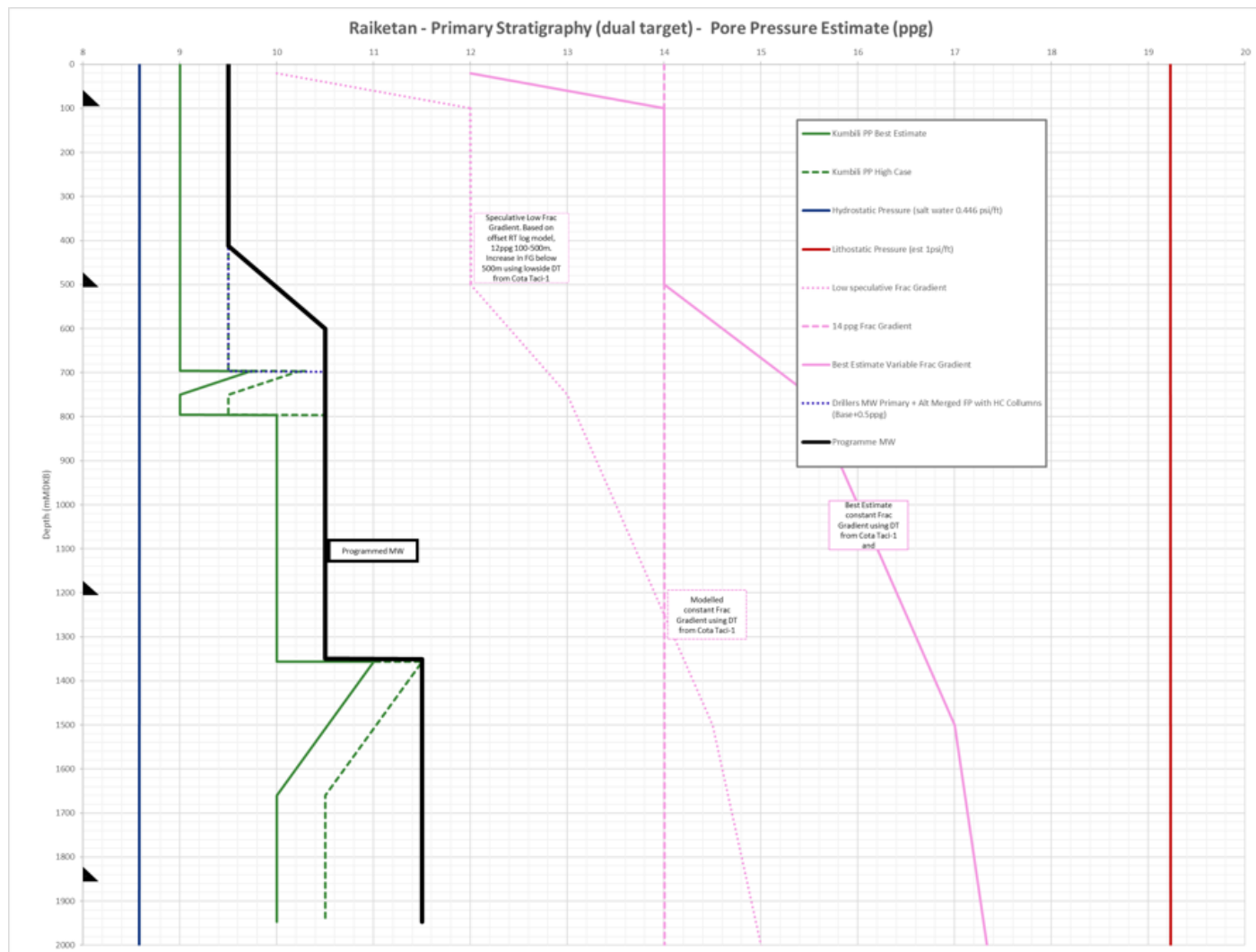


Figure 11. Raiketan-1 Pore & Fracture Gradient Prediction



4.4.1.2.2 Mud System

In order to minimise environmental impact, non-toxic water-based muds will be utilised on all wells with typical properties as per Table 2 -

Table 4:

Table 2. Surface Casing, Spud Mud

Mud Type	Gel based Spud Mud
Mud Weight	8.5 - 9.5 ppg
Plastic Viscosity	< 20 lbs/100sq ft
Yield Point	15-20 lbs/100sq ft
pH	9-10

Table 3. Intermediate Casing, Drilling fluid

Mud Type	KCl/PHPA Polymer
Mud Weight	9.5-10.5 ppg
Plastic Viscosity	< 35 lbs/100sq ft
Yield Point	16-24 lbs/100sq ft
Filtrate Water Loss	< 8 cc/30min
Mud cake	<1 (1/32in)
pH	9-10.5
Methylene Blue Test	<15

Table 4. Production Casing / Liner

Mud Type	KCl Polymer PHPA
Mud Weight	9.5-12.5 ppg
PV	< 35 lbs/100sq ft
YP	18-28 lbs/100sq ft
API Filtrate/WL	< 6 cc/30min
API Mud Cake	<1 (1/32in)
pH	9-10.5
MBT	<12.5

Potassium Chloride / Polymer muds are the most widely accepted water-based mud system for drilling water-sensitive shales, with PHPA (partially hydrolysed polyacrylamide) the polymer. The principal additives for a KCL-Polymer mud are:

Soda Ash - Sodium Carbonate (Na_2CO_3) is used to treat calcium ion contamination in the mud and Sodium Bicarbonate (NaHCO_3) cement contamination. Classed as low toxicity.



Caustic Potash - Caustic potash (KOH) is added for alkalinity control in a KCl-Polymer Mud rather than caustic soda because it provides pH control. Generally, a pH range of 9.5-10.5 is considered optimum for running KCl-Polymer muds. Low toxicity, caustic, harmful if swallowed or skin and eye exposure.

Bentonite - Pre-hydrated bentonite is used to viscosify KCl-Polymer Mud. Typically, concentrations of 5-15 lb/bbl of pre-hydrated bentonite are adequate for mud viscosity and filtration control. Not programmed to be used in these wells.

Starch - Starch is added for filtration control in KCl muds. A modified starch (starch treated with a biocide) is preferred, generally potato-based rather than corn-based. Low toxicity.

PAC LV - is a low-molecular weight polyanionic cellulose polymer, which is an extremely effective filtrate reducer. Low toxicity.

XCD Polymer - is a high molecular weight Xanthum Gum biopolymer, used to viscosify water-based muds and completion fluids. It is primarily a viscosity modifier. Low toxicity

Potassium Chloride (KCl) - Potassium chloride is used to inhibit clay hydration. Low toxicity.

Barite - barium sulphate (BaSO_4) is a commonly used to add weight to drilling mud. Low toxicity

PHPA - Partially hydrolysed polyacrylamide (PHPA) is primarily added to encapsulate solids and provide inhibition by interacting with bentonite to improve rheology. Low toxicity.

Drilling-fluid constituents can be grouped into several categories, depending on their function in the drilling-fluid system. The major categories are weighting (density control) agents, viscosifiers, thinners, fluid loss reducers and lost circulation material. There are also several minor groups of additives used for specific control such as lubricants, detergents, emulsifiers, defoamers, foaming agents, bactericides and corrosion inhibitors.

Density Control

The main density control agent will be Barite (BaSO_4). Commercially produced Barite normally contains 95% Barite (BaSO_4) along with some contaminants such as pyrite (FeS_2) and sphalerite (ZnS).



Like Calcium Carbonate, Barite is a naturally occurring biologically inert material with an extremely low toxicity when tested in simple mud systems (Hudgins, 1991).

Viscosity Control

The additives used for controlling fluid viscosity are organophilic clays such as amine treated bentonite clay or natural organic polymers such as starch, gum, xanthan, or guar gum. Viscosifiers serve a dual purpose in providing carrying capacity to the fluid and in developing a filter cake on the borehole to reduce fluid loss to the formation. Bentonite (sodium montmorillonite) is the primary clay used for viscosity; however, several other types of clays (attapulgite, sepiolite) can be used. In some applications, bentonite is treated with a small amount of water-soluble polymer to extend the viscosity-building properties of the clay, however these inert clays and polymers have very low toxicity (Jones et al., 1986). It is unlikely that Bentonite will be used in the drilling as a significant proportion of the section contains naturally occurring Bentonite.

Corrosion Inhibitor and pH Control

Drill pipe corrosion and scale can be serious problems. Corrosion of the drill string and casing during drilling can be caused by entrained oxygen within the mud or by acidic gases (CO, CO₂ and H₂S) produced during drilling. Corrosion is reduced by the addition of an oxygen scavenger such as Sodium Sulphite. Oxygen corrosion can also be reduced by maintaining the drilling fluid at pH >11 or by the addition of lime (Ca(OH)₂). This has the added advantage of stabilising the emulsions in the muds. Sodium Sulphite is also used in the food and pharmaceutical industries, it has low toxicity at the concentrations employed in the mud system (NCBI, 2020).

Fluid-loss Reducers

If properly conditioned, drilling fluids should deposit a layer or filter cake on the wall of the borehole to help prevent liquid from the mud from entering the formation. These fluid-loss reducers are primarily the clays used for viscosity control, and material such as polymers. Both natural and synthetic polymers have been utilised as fluid-loss reducers.

Starch was one of the first polymers used, followed by sodium carboxy-methylcellulose (CMC), and several varieties of polyanionic cellulosic polymers, terpolymers and polyacrylates. The earlier natural polymers were subject to bacterial decay and required a preservative. The newer modified polymer systems are less susceptible to bacterial problems, and the need for preservatives in this regard has declined. The toxicity of the major polymers used today to control fluid loss (CMC,



polyacrylates, etc.) is low-to-non-measurable (Jones et al., 1986 and Leuterman, et al., 1989).

Specialty Chemicals

Many commercial chemicals are utilised for speciality functions in drilling fluids including pH control (caustics), ion balance (potassium sources, carbonates), and corrosion control (zinc compounds). Most of the elements are naturally present in the environment and are used in limited quantities during drilling.

Lost Circulation Material

Lost circulation additives are primarily water-insoluble fibrous, filamentous, granular, or flaked material, with the most common materials used being nut shells and husks, mica and paper.

These naturally occurring products have not traditionally been bioassay-tested in drilling fluid systems because they are chemically inert and considered to be non-toxic at the level used. Any detrimental effect would be related to a mechanical, abrasive smothering action rather than chemical toxicity.

Specific-Use Additives

Lubricants are frequently utilised in water-based systems to reduce friction and prevent sticking. The traditional practice when pipe stuck was to pump a spotting fluid (50 to 100 barrels of No.2 diesel) into the stuck area to help free the drill string. The oil was later removed for separate disposal or mixed into the mud system as an added lubricant. Diesel spots have declined in use, because of regulatory constraints, and are being replaced by a variety of less toxic mineral oils. Lubricants containing oils can have relatively high toxicity levels. However, if used selectively and in moderation, regulatory compliance may still be met. A number of additives (e.g. emulsifiers, defoamers, surfactants, detergents, corrosion inhibitors and bactericides) are used at low concentration to impart specific characteristics to a mud or to treat problems. The toxicity of these products vary greatly; however, such a small volume is used so that the toxicity of the overall mud system is low enough to meet regulatory compliance (Jones et al., 1986, Leuterman et al., 1989 and Hudgins, 1991).

Cement Chemicals

Portland cement is the largest component of the cement chemicals and is essentially made up of materials such as sand, alumina and bentonite clay, with calcium and sodium chloride occasionally present. These basically inert materials comprise about 97-98% of the cement usage and discharge.



Some other categories of chemicals may be used to impart special properties to cements and are often placed deeper in the well where temperatures are higher. These chemicals are not normally discharged except as minor contamination in drilling mud. Minor amounts may be discharged when mixing systems are flushed.

4.4.1.2.3 Well Program, Schematic Design and Casing Program

Safe Operation Principle

Well design will :

- Comply with regional laws, regulations, and best industry practice.
- Be designed to avoid drilling different formation pressures in same hole section.
- Be designed to have enough overbalance pressures to control well and to mitigate possible differential sticking mechanisms.
- Be designed to consider wellbore stability and/or weak/lost circulation formations.

Casing Setting Depth Principle

The first criterion of selecting casing setting depth is the overbalance pressure without fracturing shallow formations. Kick tolerance volume is also considered for determining the casing setting depth. The formation that has been cased, needs to withstand the operation of drilling, tripping in/out, and well control for the next hole section.

Economic Principle

To deliver reduced drilling time and cost, optimize hole sizes and subsequent casing sizes. General standardization of well design is considered for all wells to optimize cost where applicable. Detailed planning of operational sequence and procedures also allow for cost savings, for example, using a liner hanger in combination with production casing to allow for contiguous testing of two intervals after reaching TD.

4.4.1.2.4 Well Design and Casing Selection

A 13 ³/₈" or 20" external/internal flush joint conductor casing should be set below the deepest known aquifer at approximately 88m and will also cover the unconsolidated sand in the Suai Formation.

The proposed upper and lower production hole casing setting depths are provided in Table 5 below. The actual setting depth will be determined during drilling and subject to actual conditions encountered. The casing depths and sizes are designed to isolate



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sections based on pressure, presence of reservoir, consolidation of formation, kick tolerance (10bbl industry standard) and hole stability.

Leak Off tests (LOT) will be conducted at the previous section casing shoe prior to drilling ahead in new hole. Drilling mud weights will initially be based on pore pressure prediction and then adjusted to suit actual conditions. Static and dynamic (Equivalent Circulating Density) mud weights will be maintained as low as possible, whilst allowing for safety margins, to maintain overbalance without causing excessive formation damage. The upper limits of mud weight will be dictated by predicted and actual (from LOT) fracture pressure and casing strength (Table 6).

Kill muds of density less than the maximum fracture weight allowable for the hole section will be prepared and available should formation flow occur. Similarly, Lost Circulation Material (LCM) will be on hand to combat any downhole losses.

Table 5. Hole and Casing Setting Depths
(target sections highlighted in green)

Hole/Casing	Karau	Kumbili	Lafaek	Laisapi	Raiketan
26" Hole	not required	88	88	88	88
20" Casing	not required	88	88	88	88
17 1/2" Hole	88	412	758	410	500
13 3/8" Casing	88	412	758	410	500
12 1/4" Hole	500	1045	1400	855	1200
9 5/8" Casing	500	1045	1400	855	1200
8 1/2" Hole	1039	1471	2909	1771	1947
7" Liner	1039	1471	2909	1771	1947
6" Hole	contingency	contingency	contingency	contingency	contingency
4.5" Liner	contingency	contingency	contingency	contingency	contingency

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**Table 6. Ratio of Condition, Criteria and Scenario for Drilling
(TR & DVH, 2018)**

Condition	Criteria	Scenario
Burst	1.1	<ul style="list-style-type: none"> • Pressure test after WOC. • Fracture at shoe with gas gradient above. • Drill ahead. • Gas over mud ratio.
Collapse	1.125	<ul style="list-style-type: none"> • Full evacuation of gas. • Loss return with mud drop. • Drill ahead.
Axial	1.6	<ul style="list-style-type: none"> • Running in hole – avg speed 1 ft/s. • Overpull force 100,000 lbf. • Post-cement static load. • Green cement pressure test 1000 psi • Service Loads.
Tri-axial	1.25	N/A

4.4.1.2.5 Well Casing Configuration

The casing configuration will be determined by the geological interpretation at each location and be subject to the down hole conditions encountered during drilling. Two generic types of designs were selected and will be used in the Drilling Program (Figure 12 and Figure 13). Note that for Karau-1 an 8 ½” pilot hole will be drilled out of the 13 ¾” casing shoe to section TD and the hole will be evaluated and then opened up to 12 ¼”, this is for increased Well Control with a smaller annulus at the shallower depth.

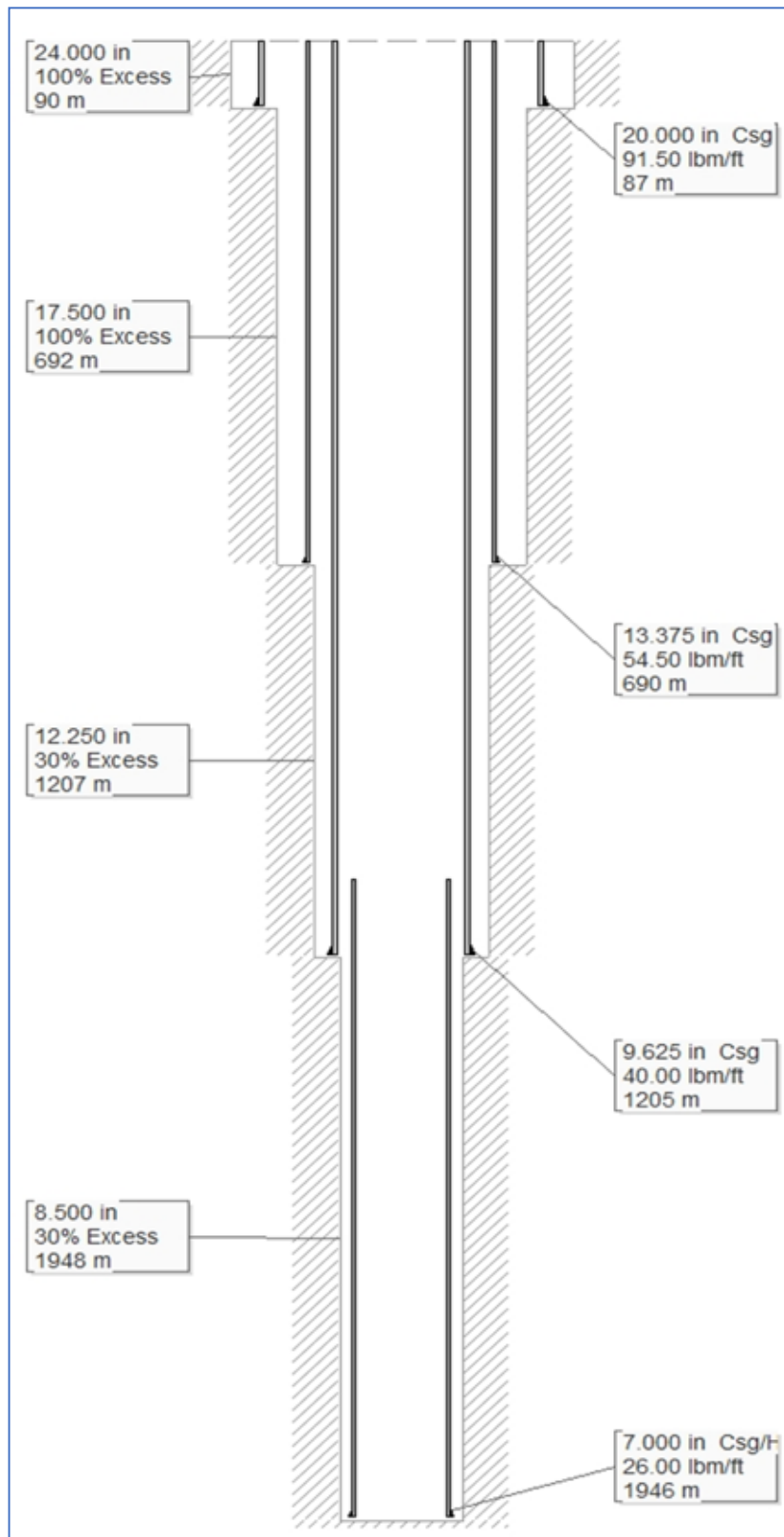


Figure 12. Generic Well Profile A (TR, 2019).
Kumbili, Lafaek, Laisapi, Raiketan (depths will vary as per Table 5)

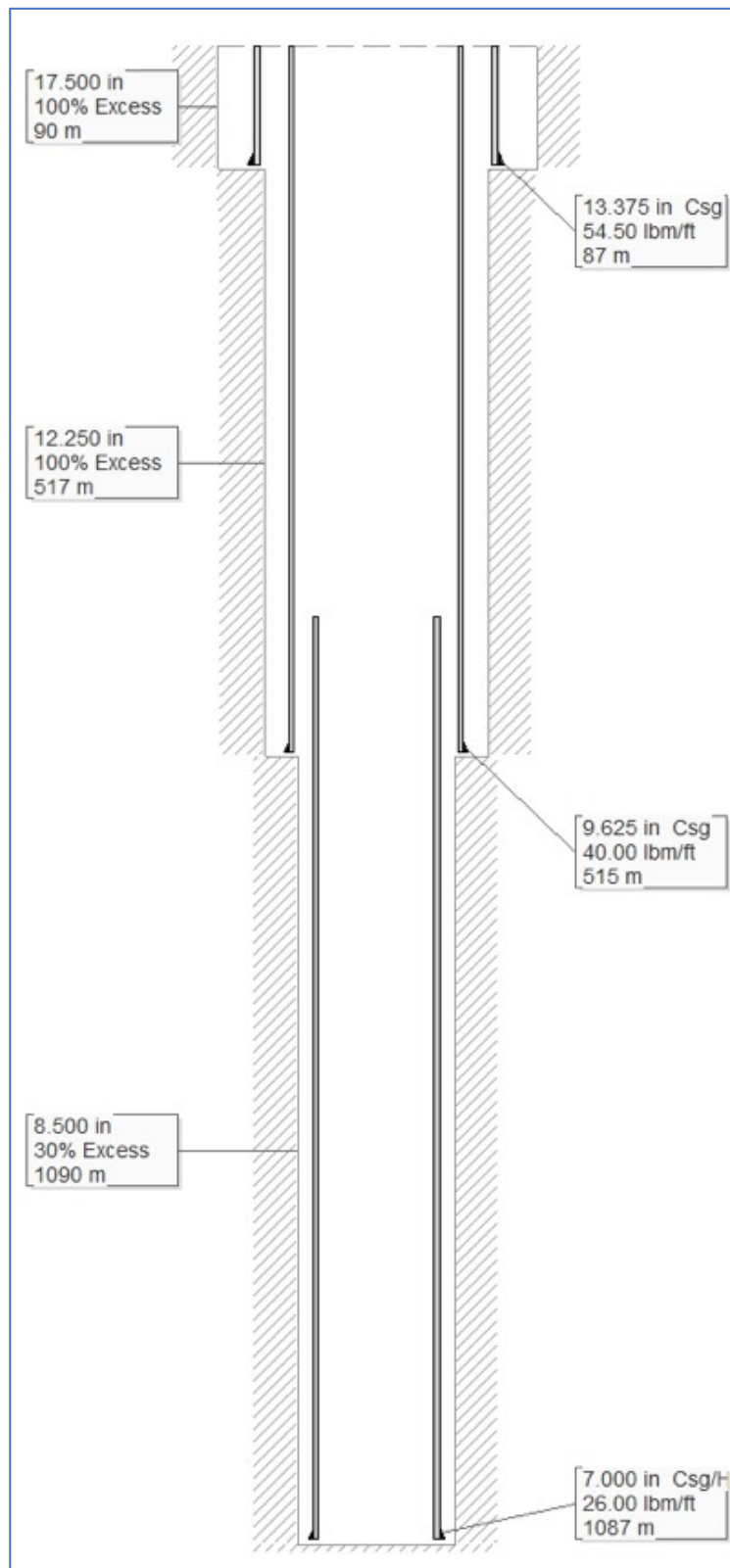


Figure 13. Generic Well Profile B (TR, 2019).
Karau (depths will vary as per Table 5)



Summarised Drilling Program (Kumbili, Lafaek, Laisapi, Raiketan)

20" Conductor Casing

The objective of the conductor casing is to case the hole through the ground water, shallow aquifers and unconsolidated sand that are found in the near surface. Based on water well data for aquifer depths in PSC TL-OT-17-08, the deepest aquifer was found at 82m.

Casing used for conductor driving will have external and internal flush joint and comply with API 5L, PSL-2. To avoid loss circulation during cementing job, light weight cement (10.5ppg tail and 12.5ppg lead) will be used. A remedial cementing job (top up job) will be performed if there are no cement returns to surface.

13 3/8" Intermediate Casing

The objective of intermediate casing is to isolate the shallow formations before entering the target reservoir and to provide sufficient LOT and kick tolerance to safely reach next section TD.

Offset well shows that the shallow formations contain shale and/or clay. KCl will be added to the drilling fluid to inhibit swelling and bit balling.

The objectives for formation logging and directional surveys can be achieved by using electric line logging, gyro runs for directional kick-off and multi-shot surveys for direction. A mud motor will be available to correct for any significant deviation from a vertical hole.

Wiper trips and circulation ensure clean hole conditions prior to the logging operation. If necessary, the MW will be increased prior to logging, to maintain overbalance

Casing grade is chosen to withstand the worst burst and collapse load scenario. Setting the casing seat as low as possible is required to provide an acceptable kick tolerance volume for well control operations.

Quality cementing operations will provide good isolation of well bore to surface. Cementing sequence and slurry weight are designed to prevent loss circulation during the cementing operations. The integrity of the cement will be confirmed by a wireline Cement Bond Log (CBL).

9 5/8" Production Casing

The objective of the 12 1/4" hole section is to drill the upper reservoir target and run



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9⁵/₈" casing to surface. Two production hole sections are programmed (7" Liner below) to avoid drilling two different reservoir formations in the same hole section. This is to reduce the risk of loss circulation into a formation with relatively lower pressure.

Conventional cores will be acquired during the drilling of the interval. After reaching section TD wireline GR-Sonic-Resistivity-Neutron-Density-SP-Caliper log, Sidewall Cores and Pressure tests will be run for evaluation. It is not proposed to run a flow test in the section until after the Well TD has been reached.

The casing will be cemented to surface and a CBL run to confirm integrity.

7" Production Liner

The objective of the 8 1/2" hole section is to drill the lower reservoir target(s) and run a 7" liner with hanger set inside the 9⁵/₈" casing. The rationale for this configuration is to allow for perforation of both the upper and lower targets after reaching TD. If a full casing was run to surface there would be two casings across the upper target which would preclude perforation and necessitate perforating and testing the upper target prior to drilling and casing the lower target.

Conventional cores will be acquired during the drilling of the interval. After reaching section TD wireline GR-Sonic-Resistivity-Neutron-Density-SP-Caliper log, Sidewall Cores and Pressure tests will be run for evaluation.

The Liner will be cemented back to the hanger inside the 9⁵/₈" casing.

Once the Liner is set Well Testing operations will be conducted, in the event of a discovery.

4 1/2" Contingency Liner

Contingency is planned for a 6" hole section in the case where an additional primary casing size is required due to drilling conditions. The 6" hole section can be completed with 4 1/2" Liner. The objective of using a liner hanger instead of long string casing is to minimize the wellhead sections.

After reaching section TD a minimum wireline GR-Sonic-Resistivity-Neutron-Density-SP-Caliper log will be run. Dependent on the evaluation and conditions an open hole test (i.e. a "barefoot test" having not run a 4 1/2" Liner) may be conducted with the packer set inside the 7" Liner.



If the secondary target is proven to not be hydrocarbon bearing, the 6" hole can be plugged and permanently abandoned without running the Liner.

Summarised Drilling Program (Karau)

Because the Karau-1 well has a shallower TD and a primary target at ~102mMD the wells design will be slightly different to the other wells. The hole will start with as reduced diameter Conductor and the upper target will be drilled with an 8 ½" pilot hole. The pilot hole has a smaller annulus which allows for better Well Control, with smaller volumes for flows and kill muds if hydrocarbons are intersected in the interval. The remainder of the drilling program rationale for Karau-1 is the same as the other locations.

17 ½" Conductor Casing

The Conductor will be set at 88mMD, beneath the deepest aquifer based on water well drilling in PSC TL-OT-17-08.

Casing used for conductor driving will have external and internal flush joint and comply with API 5L, PSL-2. To avoid loss circulation during cementing job, light weight cement (10.5ppg tail and 12.5ppg lead) will be used. A remedial cementing job (top up job) will be performed if there are no cement returns to surface.

9 5/8" Production Casing (8 ½" Pilot Hole opened to 12 ¼")

The pilot hole will be drilled to the base of hydrocarbons, or if no indications, to 500mMD. Conventional cores may be acquired during the drilling of the interval. After reaching section TD wireline GR-Sonic-Resistivity-Neutron-Density-SP-Caliper log, Sidewall Cores and Pressure tests will be run for evaluation. The hole will then be opened up to 12 ¼" and a 9 5/8" Casing run and cemented back to surface. A CBL will be run to confirm cement integrity.

7" Production Liner

An 8 ½" hole will be drilled to evaluate secondary targets from 500m to TD at approximately 1037mMD.

Conventional cores may be acquired during the drilling of the interval. After reaching section TD wireline GR-Sonic-Resistivity-Neutron-Density-SP-Caliper log, Sidewall Cores and Pressure tests will be run for evaluation. If hydrocarbons are indicated a 7"



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Production Liner will be run and cemented with a hanger inside the 9⁵/₈" Casing. A CBL will be run to confirm integrity.

If evaluation indicates hydrocarbons in the primary or secondary objectives, Well Testing will be carried out through the 9⁵/₈" Casing or 7" Liner.

4.4.1.3 Suspension or Abandonment

After the well has been evaluated and tested a decision will be made to either Plug and Abandon (P&A) or Suspend the well for further testing or re-purposing as a producer.

If the well is deemed to not contain hydrocarbons cement plugs will be set to isolate any porous units, either in open hole or casing if perforated. The composition and length of the plugs will comply with industry standards and the P&A program as approved by the regulator. After the well has been abandoned the lease will be rehabilitated, with a permanent marker placed at the surface hole location.

In the case that the well contains hydrocarbons that are commercial or could be commercial with further testing or appraisal well drilling, a suspension procedure will be carried out. The suspension will be approved by the regulator and may consist of temporary plugs, surface cap or wellhead ("Christmas Tree"). If future operations are not envisaged to require the full exploration drilling pad the lease area may be scaled down and the immediate area of the wellhead fenced off and secured.

4.4.2 Size of the Project

PSC TL-OT-17-08 is an area that covers of 1445.2 km², comprising 1,057.8 km² onshore and 387.4 km² in the near offshore to an average distance of 7km from the coastline, which is 64km long and up to 34.5 km inland.

The area required for the drilling campaign is 5 hectares in total as each well location will occupy 1 hectare of land. In addition, TR will also build access roads approximately 6m wide with a clearance of 20m, from the nearest existing highway, arterial or local road. The existing Haemanu base camp (Suco Labarai) occupies 1.8 hectares.

4.4.3 Location of the Project

The proposed wells (Figure 14) are within the Covalima District, Karau-1 (Suco Matai), Kumbili-1 (Suco Kamanasa), Lafaek-1 (Suco Labarai), Laisapi-1 (Tashilin), Raiketan-1 (Belekasac).

The exploration drilling campaign requires the building of well leases and access roads from the nearest public roads. An existing camp at Haemanu, originally built by Covec for the TasiMane road project, will be used as the base camp for the project.

The well leases are approximately 1Ha and, where on private land, a short-term rental payment will be negotiated with the landowner. Access road requirements vary depending on the well location, but leasing will be conducted in the same manner as the Well sites. Existing public infrastructure such as highways and local roads, bridges and underpasses have been assessed. If required, they will be upgraded or modified with approval of the relevant authorities to allow for the safe mobilisation of the equipment to the project locations.

The Operator will consider all aspects including aesthetic, socio-economic, environmental, safety and health issues when conducting the project activities. Infrastructure and operation requirements will be designed to comply with the legislation and industrial best practice.

Project Location Maps

A set of Maps, covering each drilling location and the base camp are included below in Figure 18 - Figure 28. The maps are arranged in pairs for each wellsite and a single map for the Haemanu Base camp. The first map in each set covers an area of approximately 3km radius from the well location and the second, a more detailed view approximately 350m radius, of the wellsite and nearby infrastructure. The two map scales were chosen after assessment of zones of potential impact for the drilling program.

The 350m extent maps include road networks as above, the wellsite perimeter, urbanised areas and individual buildings and other infrastructure. An indication of the potential for the noise impact within the area is also shown. Air quality impact is not included as it is subject to total amounts and environmental conditions such as wind speed and direction, this is covered in more detail in subsequent sections of this report.

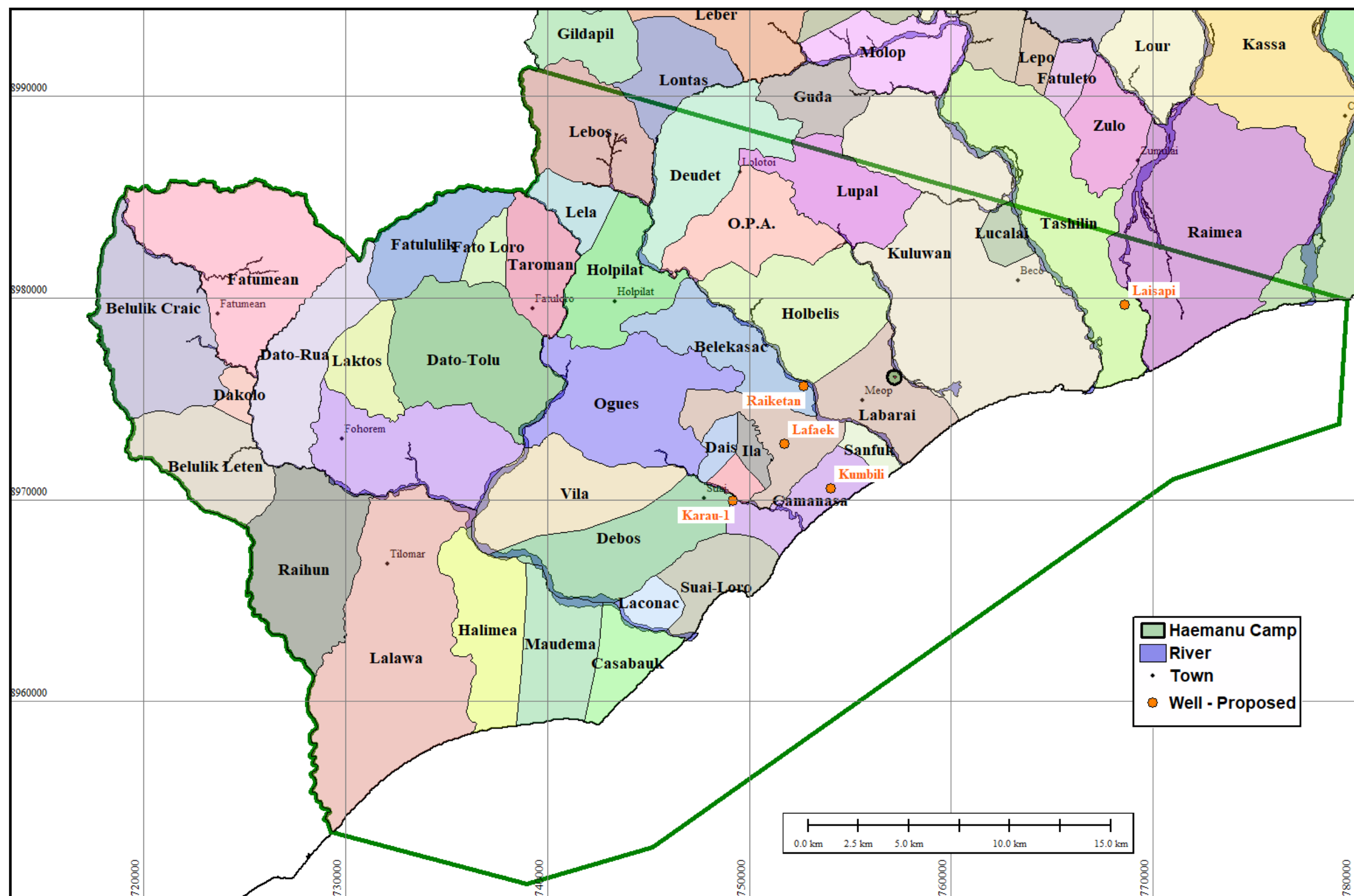


Figure 14. Location of the Project



Drainage

A 30m Satellite DTM was used to compute a watershed analysis for each site. The analysis provided the catchment area upstream of the well site and the direction of flow(s) from the site. Each drilling location will have berms to distribute surface water run-off around the site and minimise disruption of natural flow patterns. Surface water that falls on the site will be directed to a watercourse on the downstream side of the lease. At some locations, the drainage has been altered by urbanisation and cultivation with road easements and irrigation channels diverting the natural flow. In these instances, the preferred diversion route is to an adjacent significant water course to minimise disruption to this infrastructure. Catchment areas and downstream flow extent are provided Table 9.

Table 7. Catchment Areas and Outflow Length

WELL SITE	CATCHMENT (km ²)	NATURAL OUTFLOW LENGTH (km)	DIVERTED OUTFLOW LENGTH (km)
KARAU-1	0.041	6.09	4.75
KUMBILI-1	0.113	1.07	
LAFAEK-1	0.026	5.62	
LAISAPI-1	3.395	3.87	
RAIKETAN-1	0.044	6.61	7.07

Access

The length and approximate area of the access roads that connect the well site to the public road infrastructure are listed in Table 8. Civil engineering details are available - see Timor Resources 2020b.

Table 8. Length of Access Roads

LOCATION	ACCESS ROAD LENGTH (m)	APPROXIMATE AREA (m ²)
KARAU-1	29	290
KUMBILI-1	1336	13360
LAFAEK-1	61	610
LAISAPI-1	2603	26030
RAIKETAN-1	27	270
HAEMANU CAMP	8	80



Karau – no significant access road, wellsite is leased from by private land owner. Land owner was confirmed with Government Land and Property the regulating body for land and property in Timor-Leste. See Figure 19 below.

Kumbili – ~1.3km long road of ~6m width (10m width was cleared) utilised existing track. Land for access road is partially privately owned and partly owned by government (Timor Gap supply base). The Kumbili well site is located on Timor Gap's land. See Figure 20 below.

Lafack – no significant access road require, site is located directly on the main highway. Application process to access highway is in progress with Public Works. See Figure 23 below.

Laisapi – will require new access road from the village road, the length will be around 2.5km length and 10m width will be cleared then pave and compact using river rock for 3km x 6m width finish access road. There is no current plan to drill this well, however detailed civil engineering plans will be prepared should the need arise. See Figure 15 below.

Raiketana - as with Laisapi, there is no current plan to drill this well, however, detailed civil engineering plans will be prepared should the need arise. See Figure 16 below.

Noise

The areal impact of noise is subject to several influencing factors such as temperature, humidity and wind speed and direction. Noise monitoring and mitigation is covered in more detail in later sections of this report. However, to assess the potential impact of noise on the surrounding communities, the attenuation distance of noise level in air was calculated. Noting that the actual noise levels will be less than calculated where intervening infrastructure and vegetation are located between the source and monitoring location. The type of walls of dwellings, for instance brick or wood, will also impact noise levels. Sound level units are quoted in total decibels (dB) or decibels within the human audible frequency spectrum (dBA)

The typical sound levels for rig components and locations are given in Table 9 (from (Radtke, 2016), (Abadi et al, 2015)& (SLR Consulting, 2011)). The actual sound levels during the operation will be subject to the type of activity being conducted (e.g. drilling, tripping, circulating).

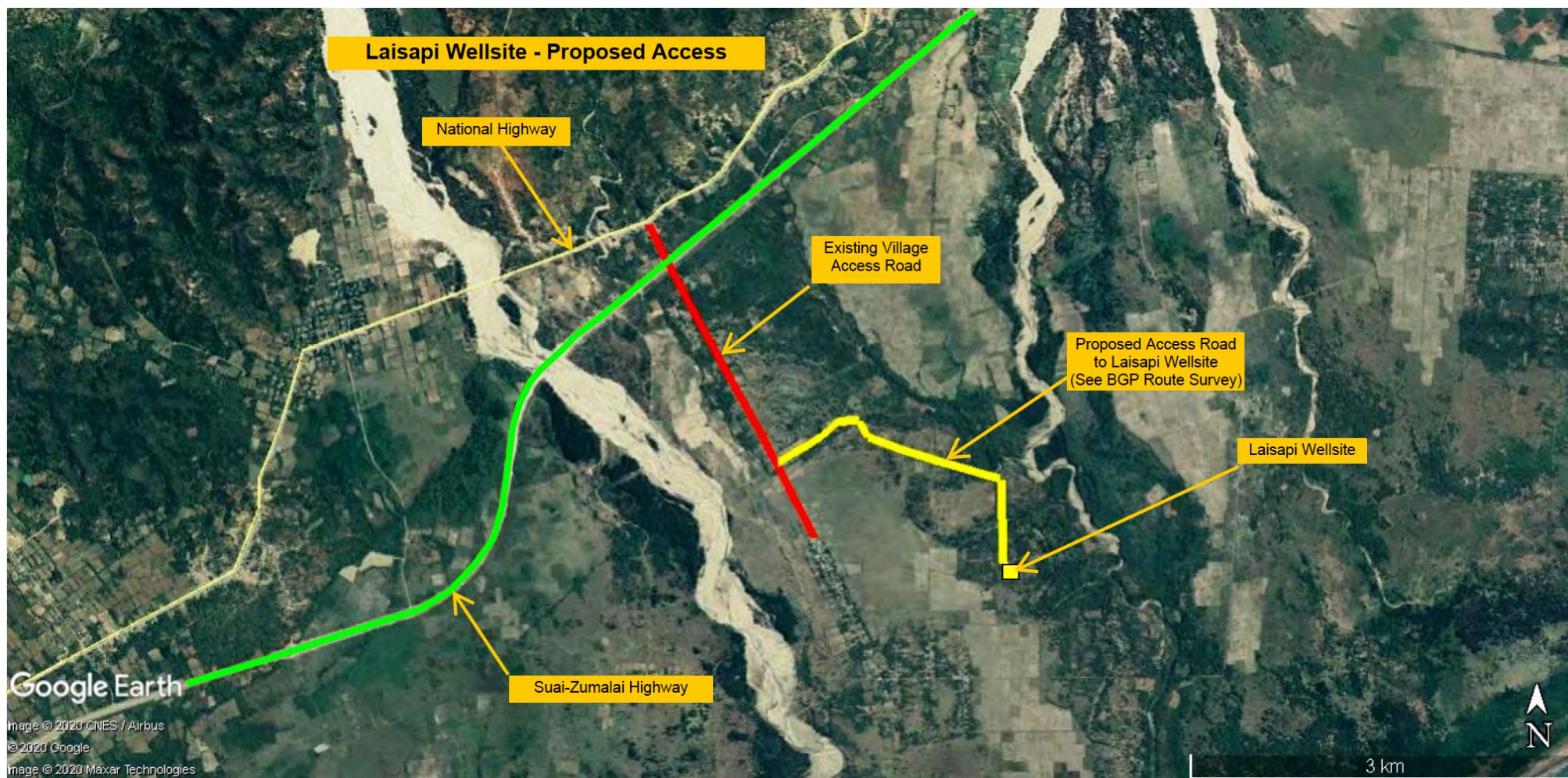


Figure 15. Proposed Laisapi Access Road



Figure 16. Proposed Raiketan Access Road (to be confirmed)



Table 9. Typical Noise Levels Emitted by Rig Equipment

SOUND LEVEL (DBA)	TYPICAL SOURCE	SUBJECTIVE EVALUATION
130	N/A	Intolerable without PPE
100-120	Engine Generators, Desander / Desilter	Extremely Noisy
80-100	Mud Pumps, Compressors, Shakers	Very Noisy
60-80	Rig noise in camp offices	Loud
40-60	Rig Noise at site perimeter	Moderate to Loud
30-40	Rig Noise 350m from Source	Quiet
20-30	Rig Shut down, background	Almost Silent – Very Quiet

The percentage drop in sound level with distance from source was calculated using Free Field Inverse Square Law. Using $dB_2 = dB_1 + 10 \ln(d_1/d_2)$ where dB_2 is the sound level at a given point at a distance of d_2 from the sound level dB_1 at a distance of d_1 from the source. For the purpose of this calculation a sound level of 80dB 1m from the source was used (Figure 17) and plotted on the 350m extent maps.

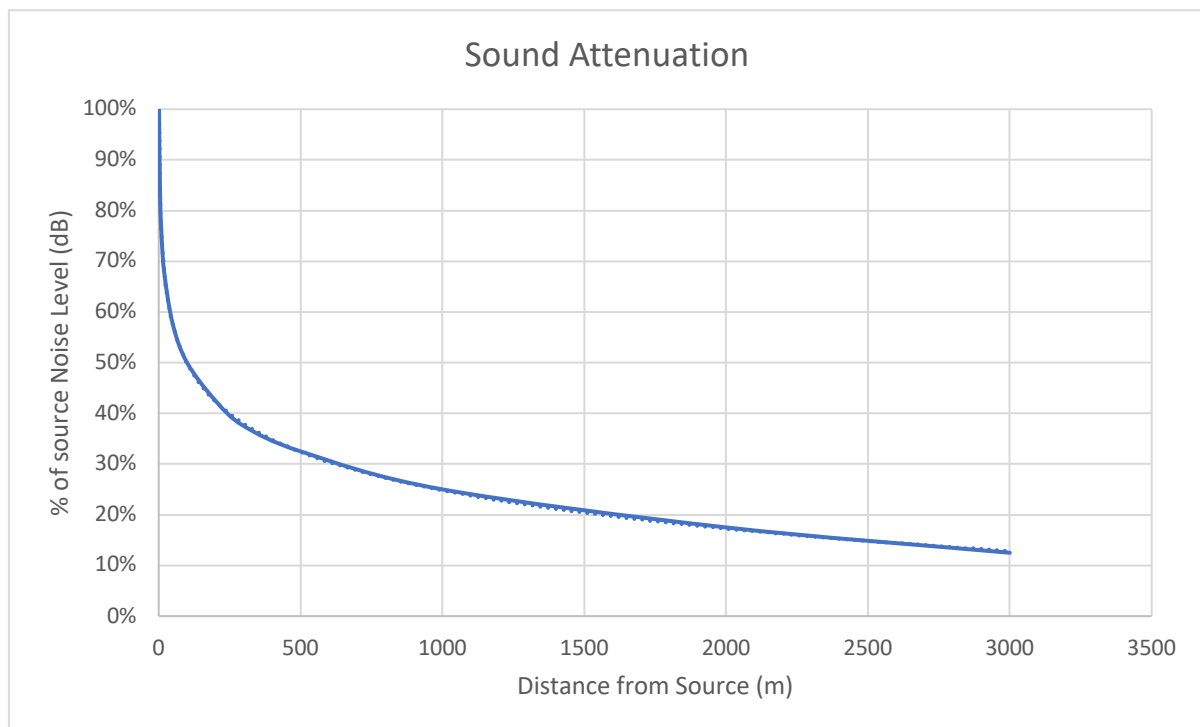



Figure 17. Attenuation Rate of Sound Level in Air

 <p>Timor Resources</p>	<p align="center">Operating Management System</p> <p align="center">Environmental Impact Assessment - Drilling Activity</p> <p align="center">PSC TL-OT-17-08</p> <p align="center">Doc No: TR-HSE-EIA-001</p>	<p>Revision: Rev 2</p> <p>Issue date: 24/12/20</p> <p>Page: 70 of 179</p>
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Observations at Specific Locations

Karau-1: The location sits in a small surface water catchment area; the natural drainage direction is to the south but has been heavily modified by the urbanisation in the area. The drainage ditch along the road adjacent to the southern edge of the site will be upgraded to allow for diversion of water to the Caraulun River, 200m to the east.

The area with 350m of the well site is sparsely populated, the Suai Prison lies 151m to the west of the perimeter fence.

Kumbili-1: The location is situated within the confines of the Suai Supply Base Boundary. It is in an area of natural vegetation and sparse cultivation; access will be from the north and intersect the highway immediately east of Sanfuk township. Surface water run-off will be diverted around the site and continue to the stream to the south, minimising disruption to the natural flow.

No infrastructure exists within 350m of the location so disturbance impacts will be minimal.

Lafaek-1: Is located on the southern side of the TasiMane Expressway, it occupies a small catchment area which will be diverted around the location to a stream to the southwest. Apart from the Expressway, no infrastructure is present within 350m of the location.

Laisapi-1: Is the easternmost location in PSC TL-OT-17-08, approximately 1km from the township of Kuluan. The site occupies a position within lightly vegetated woodland to the south of an extensively cultivated and irrigated catchment area. The area is low lying, with an elevation drop of only 28m over a distance of 4km within the catchment. Hence, whilst there is potential for flooding at the location, the depth of water would be shallow and diverted around the site to the natural watercourse to the south. No existing infrastructure exists within 350m of the location.

Raiketan-1: As discussed previously, due to technical reasons, it is unlikely that Raiketan will be drilled in the first phase of the program. The ideal technical location is within the Raiketan River, so the site needs to be located to either the southern or northern banks. Whilst a northern location would allow for technical objectives to be achieved there is no, or limited, access if the river is flowing so could only be drilled in peak dry season. The southern location, as shown, provides for year-round access but precludes achieving all the objectives without significant technical risk.

The natural drainage from the site is to the south but would be diverted to the east into the Raiketan River to minimise impact on the local community infrastructure.



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Several dwellings are situated within the 350m radius of the location. If these are impacted by noise, then temporary noise barriers may be required or the occupants may be provided with alternative accommodation for a short period during the operation.

Haemanu Camp: The noise levels from the camp will be low, the main contributions being from heavy vehicle movement (daylight hours only) and a small generator to provide camp power if the EDTL supply is interrupted.

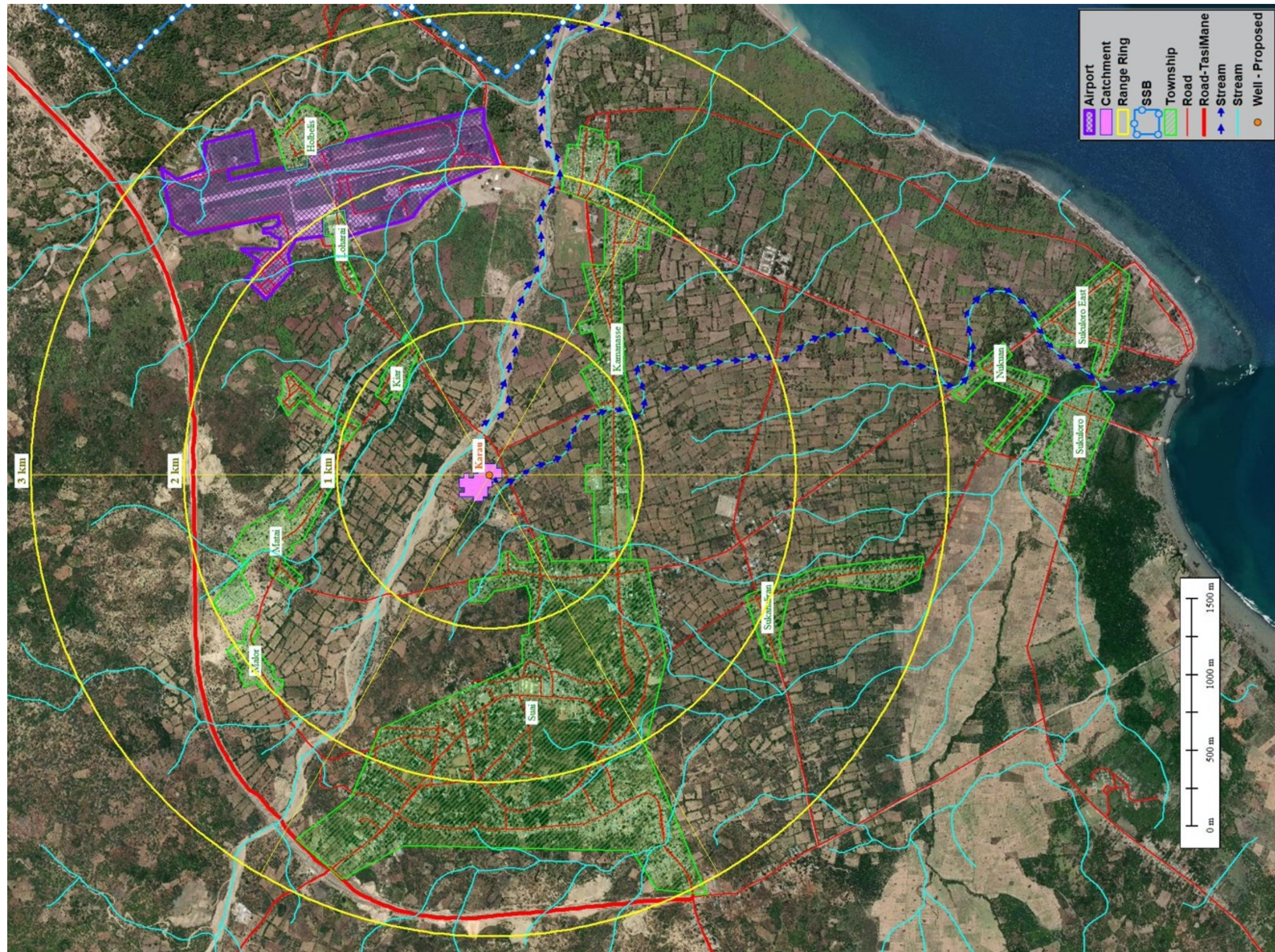


Figure 18. Karau-1 Regional Area of Potential Impact

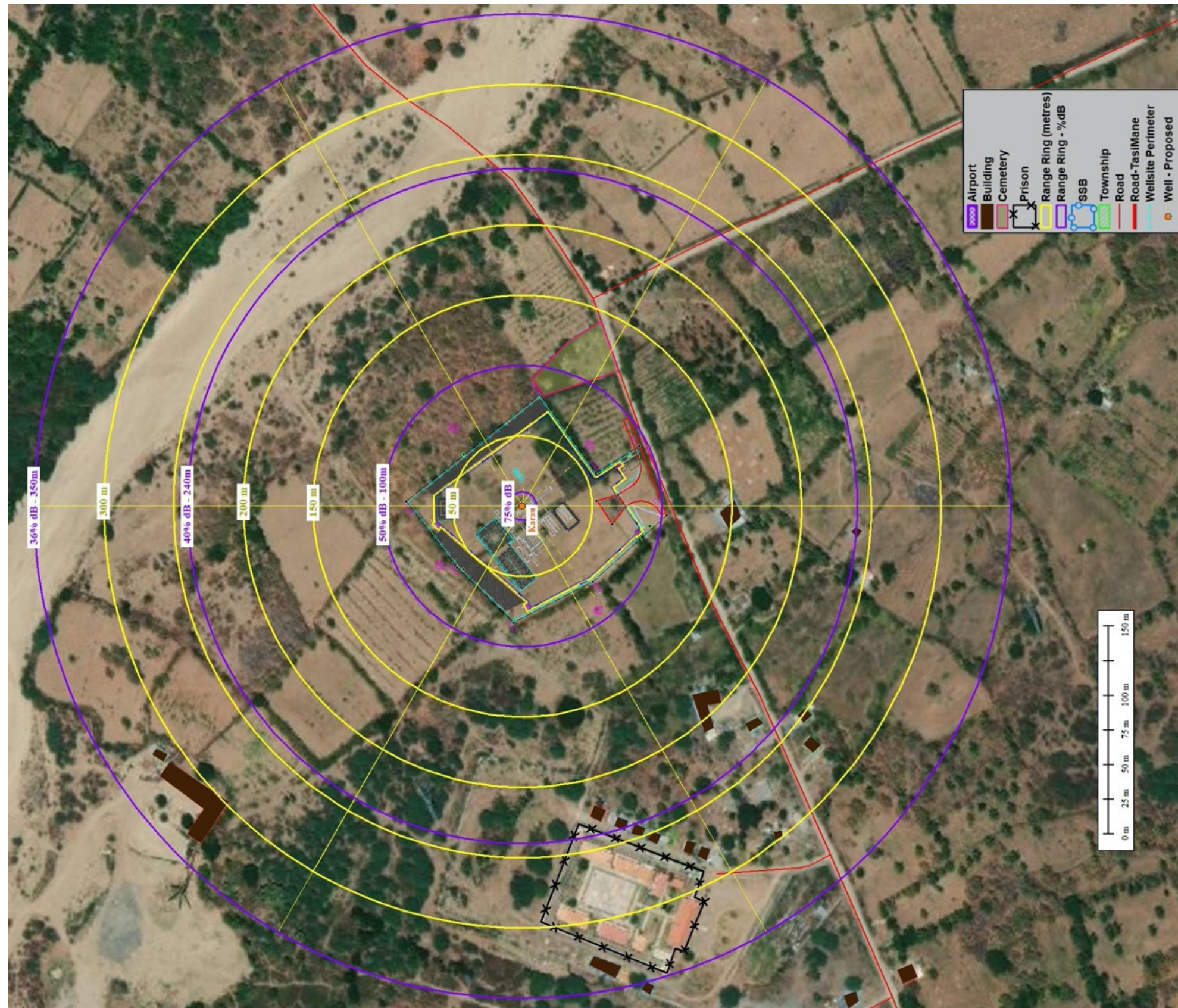


Figure 19. Karau-1 Wellsite, Local Infrastructure and Noise Attenuation

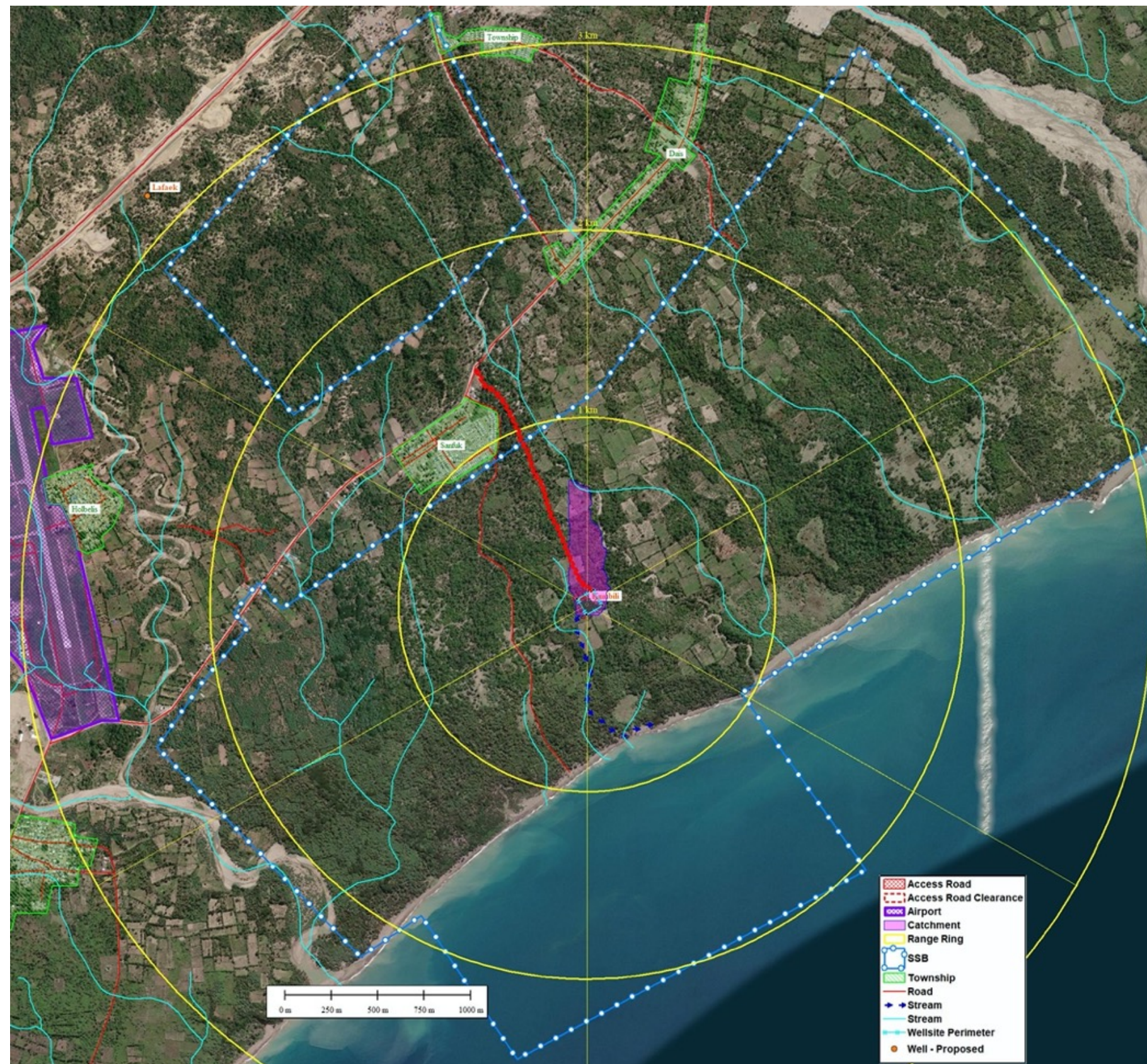


Figure 20. Kumbili-1 Regional Area of Potential Impact

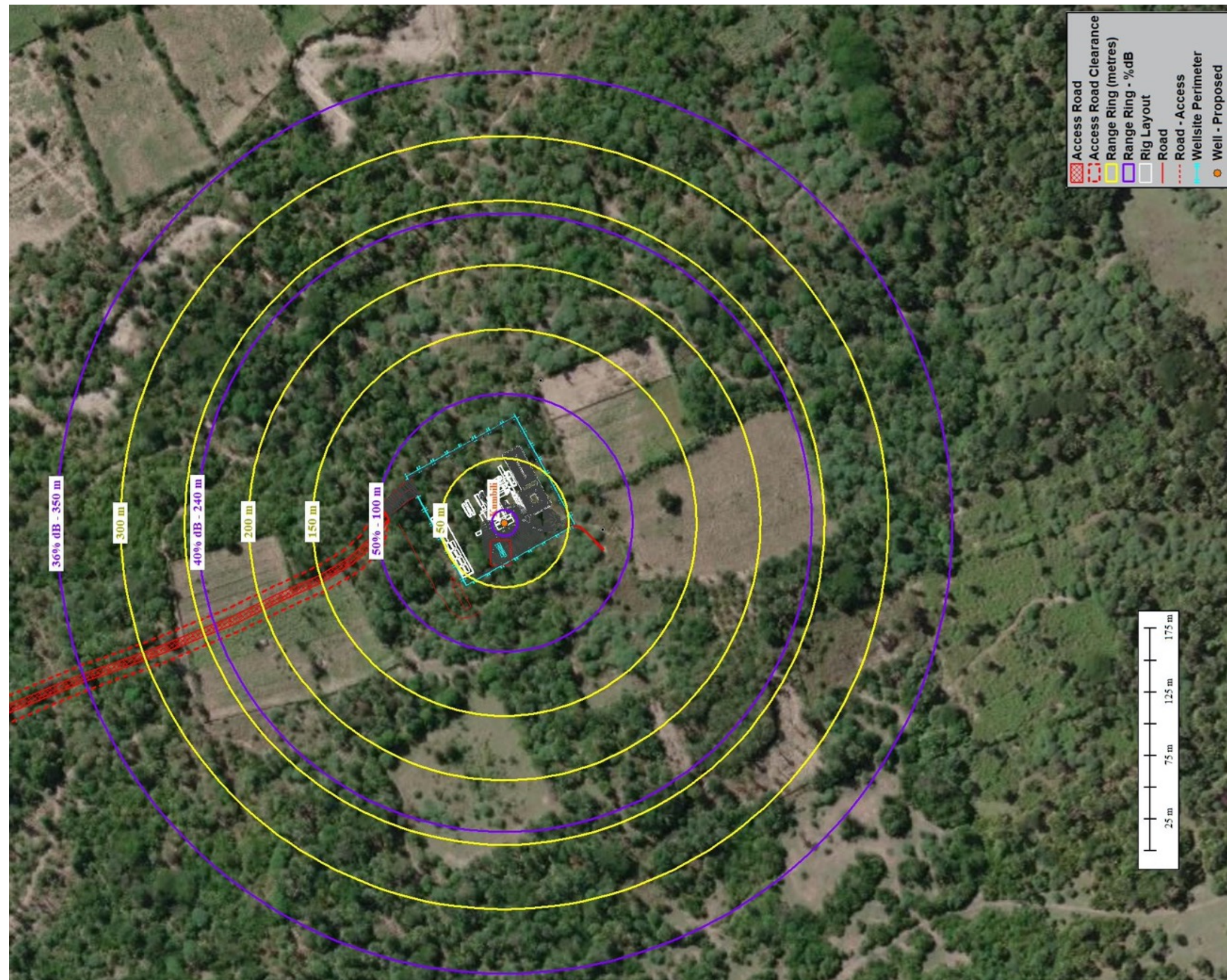


Figure 21. Kumbili-1 Wellsite, Local Infrastructure and Noise Attenuation



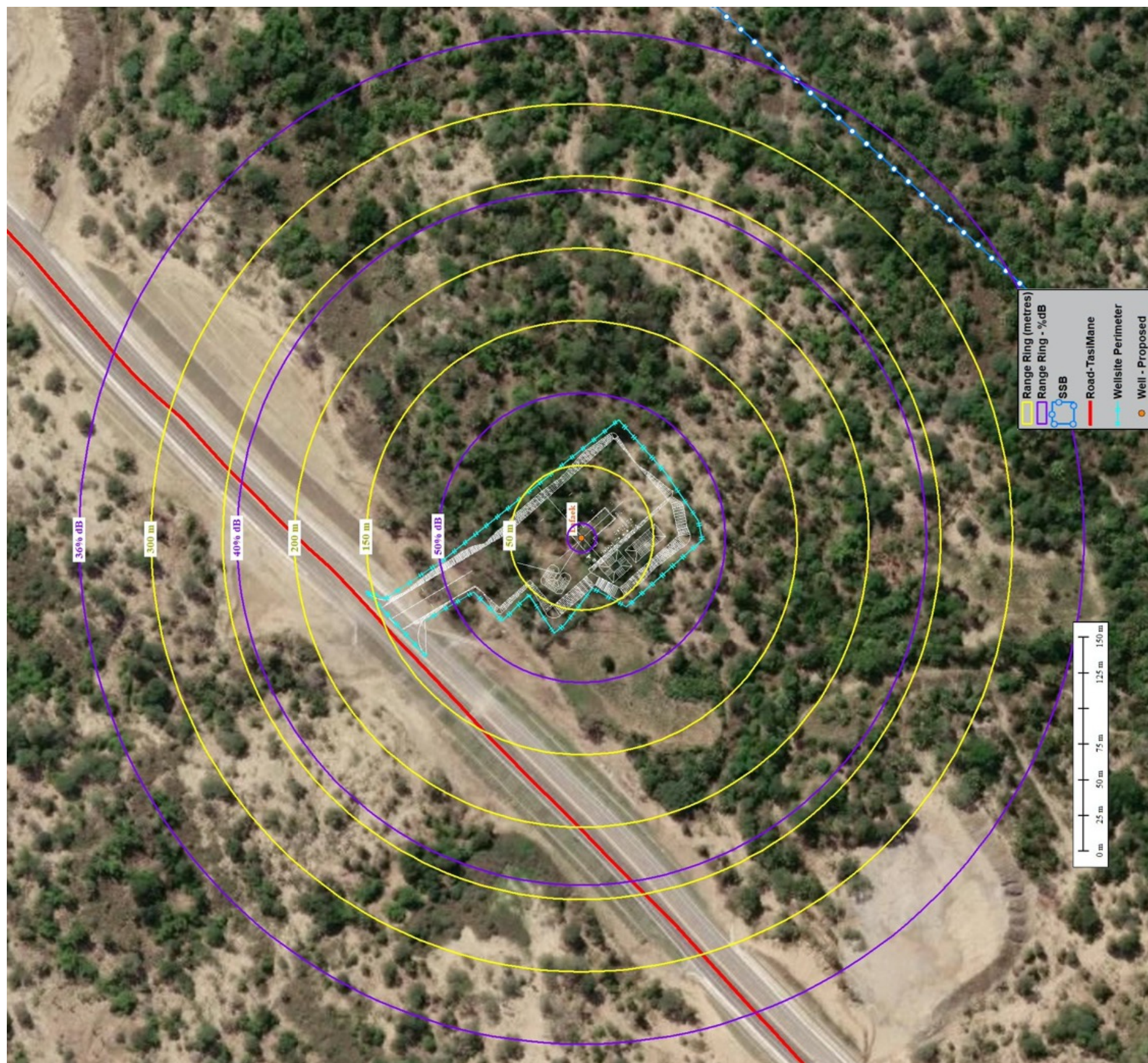


Figure 23. Lafaek-1 Wellsite, Local Infrastructure and Noise Attenuation

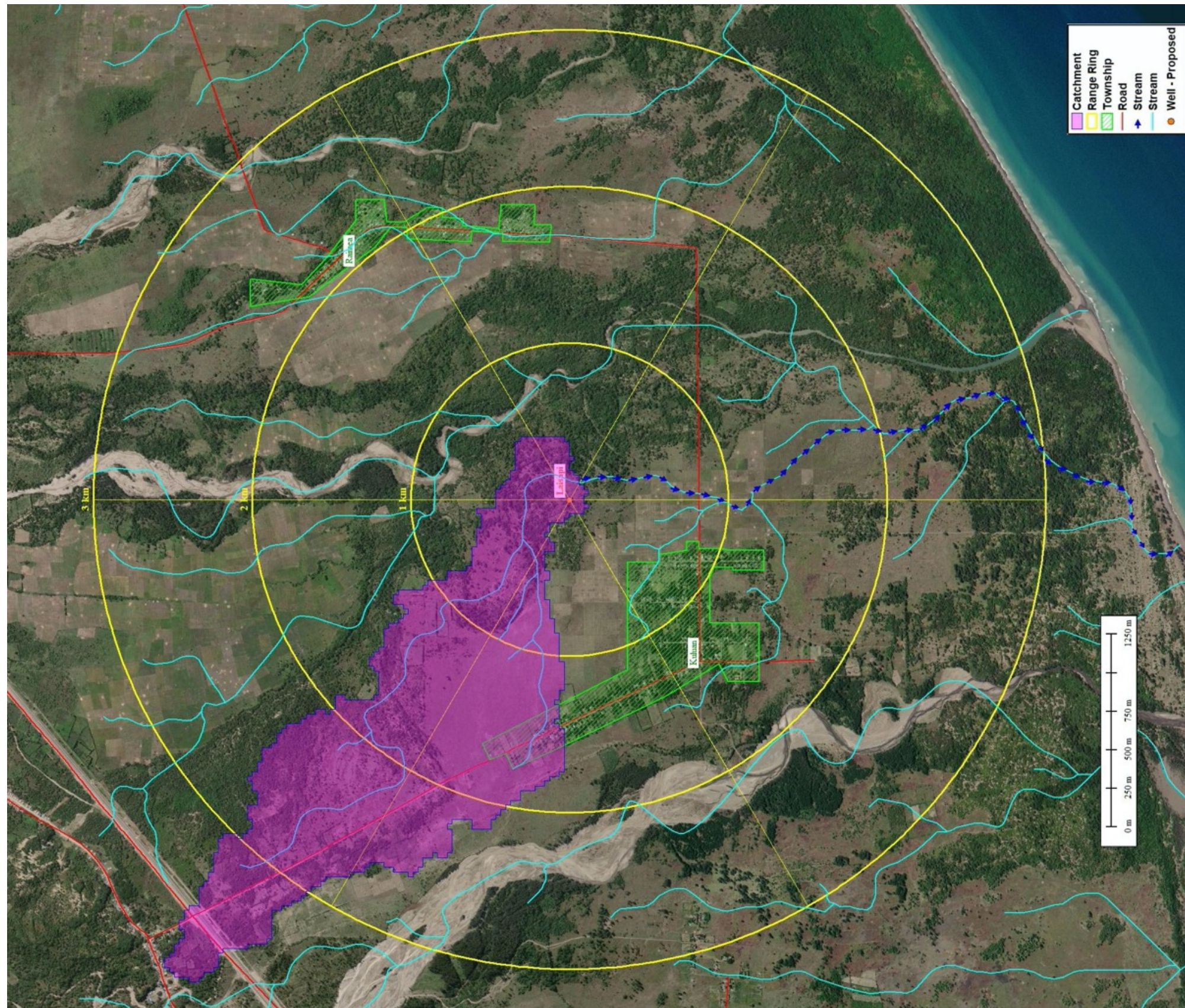


Figure 24. Laisapi-1 Regional Area of Potential Impact

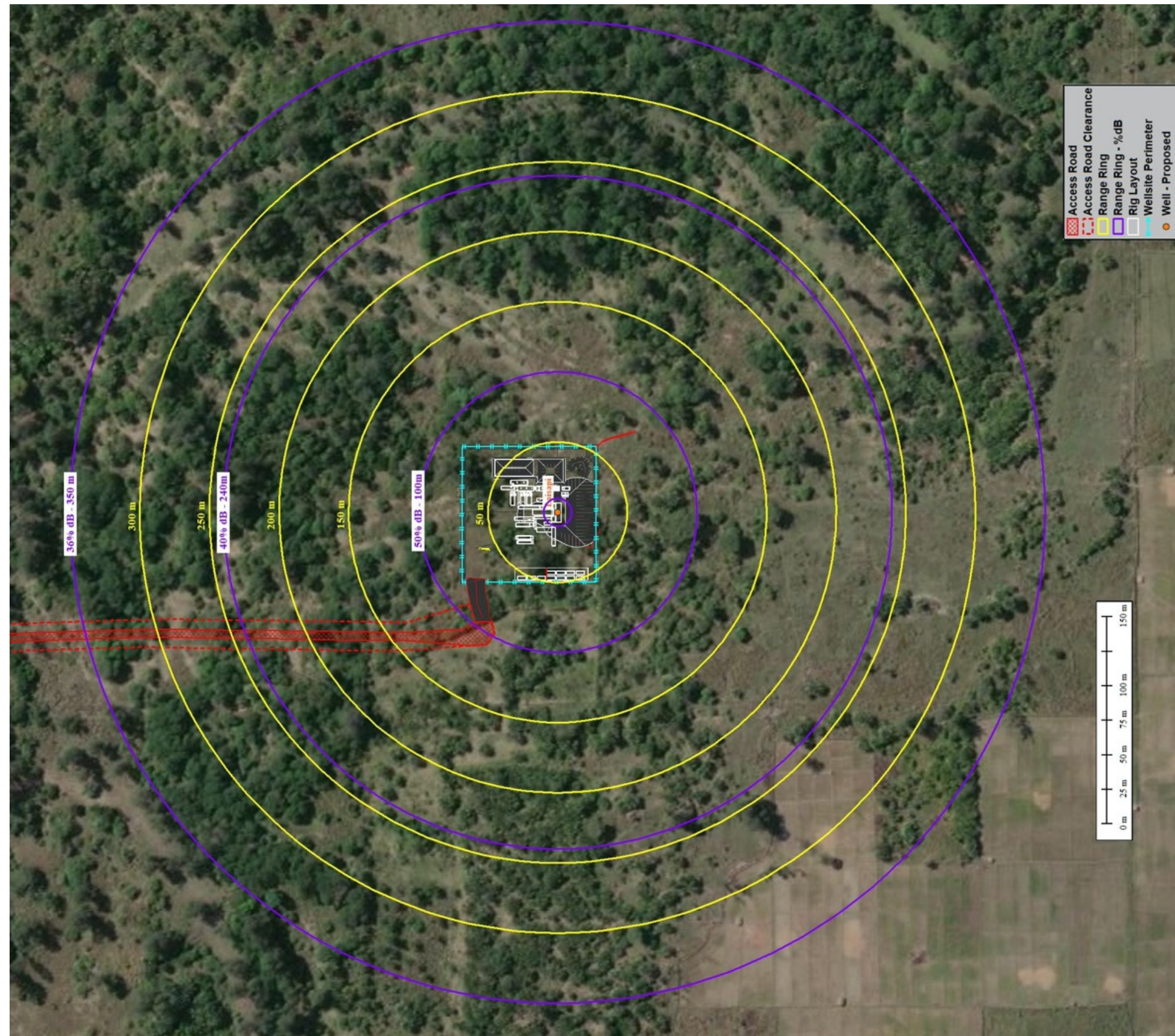


Figure 25. Laisapi-1 Wellsite, Local Infrastructure and Noise Attenuation

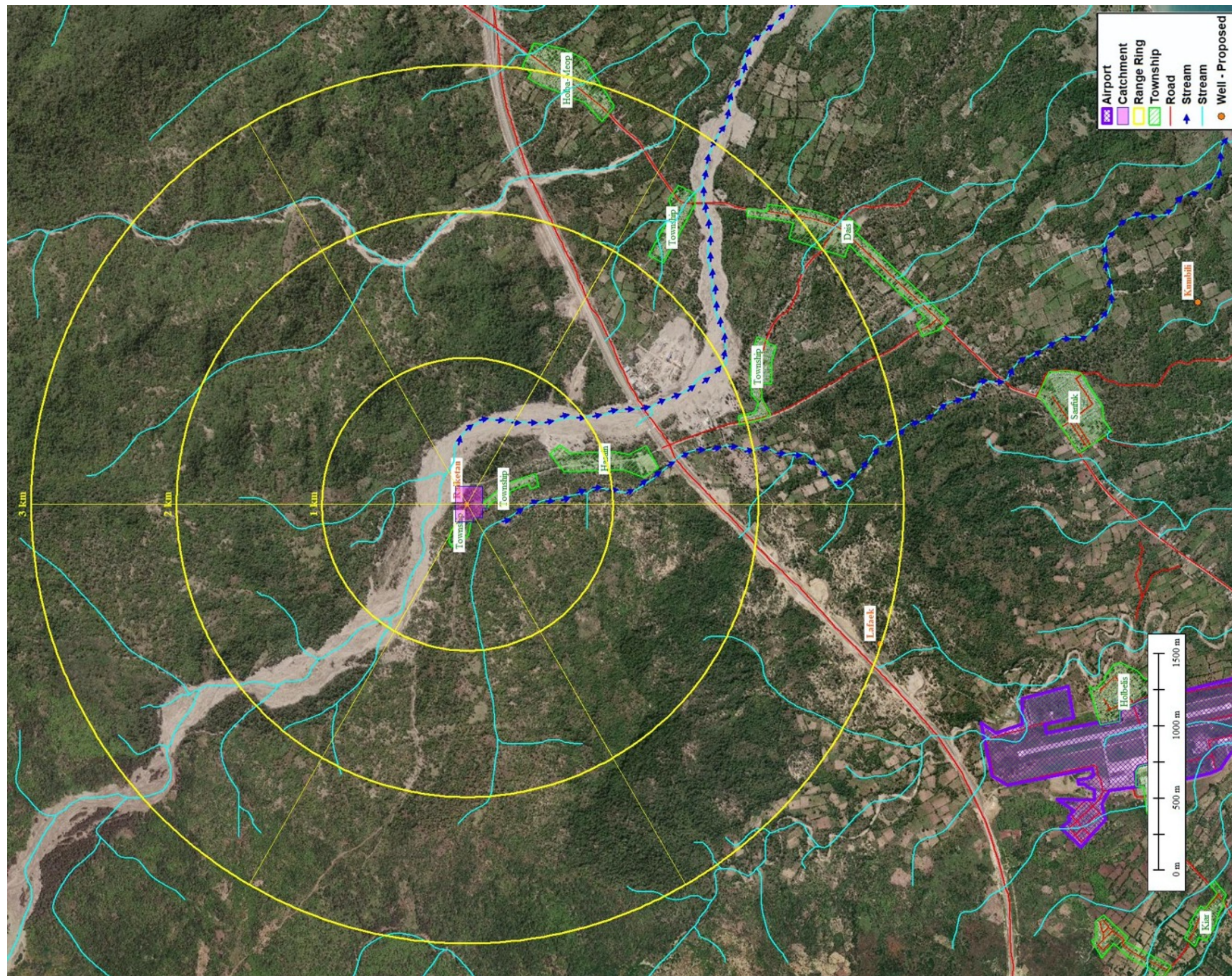


Figure 26. Raiketan-1 Regional Area of Potential Impact



Figure 27. Raiketan-1 Well site, Local Infrastructure and Noise Attenuation

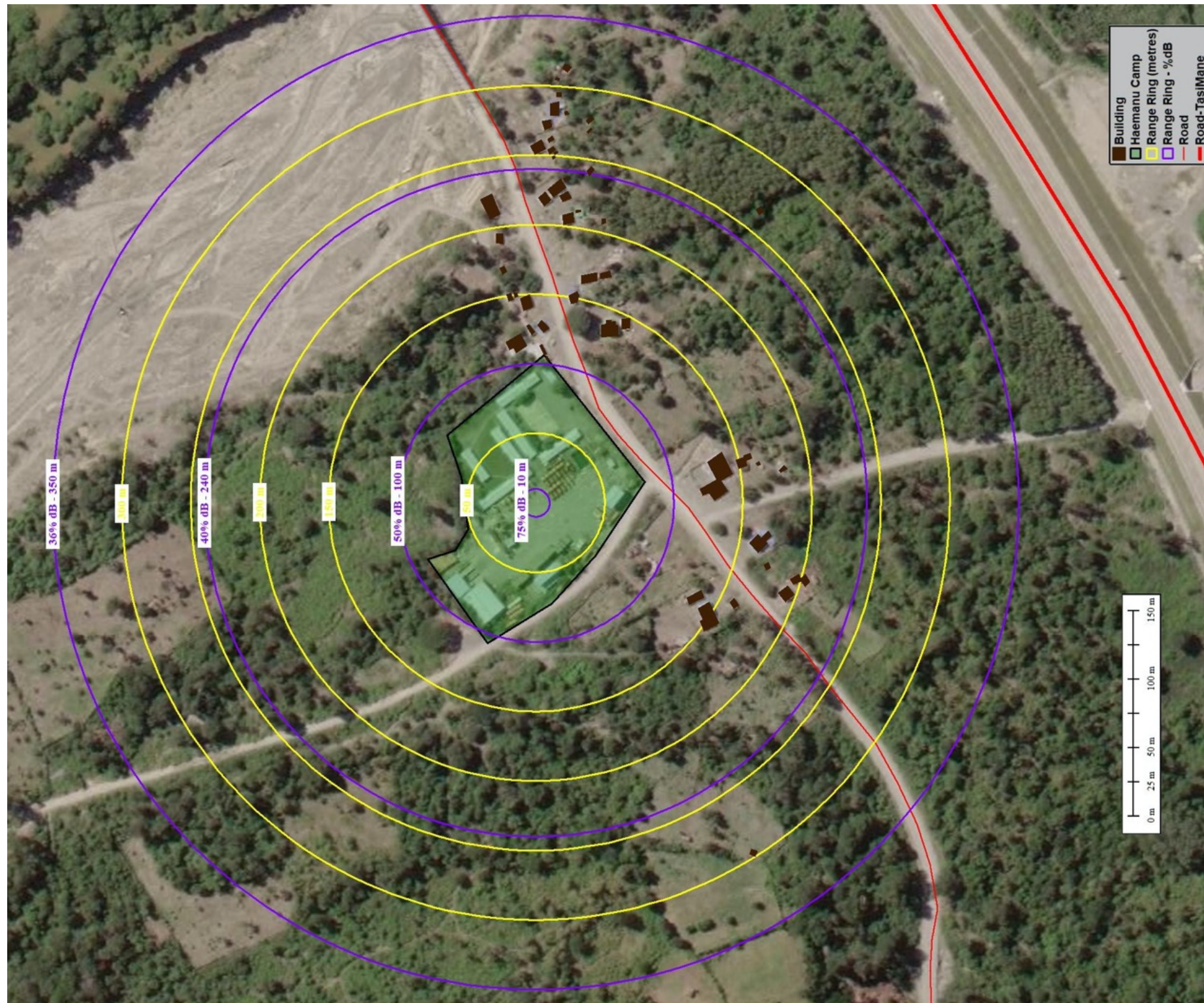


Figure 28. Haemanu Camp, Infrastructure and Noise Attenuation

4.5 JUSTIFICATION AND NEED FOR THE PROJECT

Timor Resources (TR) is a privately-owned Timor international oil and gas company that is in joint venture with TIMOR GAP, E.P. (TG), the National Oil Company of Timor Leste (NOC - TL). On 7 April 2017, TR engaged an agreement with the Timor Leste Government permitting the company, with its partners, to begin the process of exploration, development, and exploitation of petroleum resources in the onshore contract area, identified as PSC TL OT-17-08.



In order to assess the potential for commercial oil accumulation within the contract area TR has conducted Geological and Seismic surveys and integrated existing data. The interpretation of this data has led to the delineation of a Prospect and Lead portfolio which can only be tested by Exploration and Appraisal Drilling. The Exploration Drilling determines the presence of moveable hydrocarbons and collects numerous data from the penetrated section (e.g. Fluid gradients and formation pressure, temperature, rock properties, age of deposition). Appraisal Drilling is then required to start testing the extent of the discovery, initial flow rates, pressure connectivity with the exploration well and other components that allow for modelling of the potential commerciality of the field. If commerciality is established the exploitation moves to the production drilling phase and recovery of the resource.

Exploration and Appraisal drilling is a fundamental mechanism in the process to return value to the private and government stakeholder investment. The associated value is in terms of local employment, improved living conditions and more infrastructure. The discovery of commercial oil accumulations will bring significant value to Timor Leste through further investment.

There are currently no known alternative technologies to exploration drilling to confirm the presence of commercial hydrocarbons.

4.6 THE PROPONENT'S APPROVAL OF THE EIA

Timor Resources management approves the contents of this report and is committed to implement the controls, to the best of their ability, as contained herein.

Name	Position	Signature
Suellen Osbourne	Managing Director	
Jan Hulse	Exploration Manager	

4.7 EIS STRUCTURE

The EIS is prepared in accordance with the template provided in Annex 4 of the Diploma Ministerial No.46/2017 of 2nd August. Hence, this EIS contents contain:

1. Executive Summary.
2. Details of the Project Proponent.
3. Details of the EIA consultants.
4. Description of the Project.
5. Policy, Legal, and Institutional Framework
6. Description of the Environment.
7. Climate Change.
8. Alternatives.
9. Impact Assessment and Mitigation Measures.
10. Social Impact Assessment.
11. Economic Assessment.
12. Summary of Environmental Management Plan.
13. Public Consultation and Information Disclosure.
14. Difficulties encountered.
15. Conclusions and recommendations; and
16. Non-Technical Summary.

5 LEGAL REQUIREMENTS

The following table provides a summary of the principal legislation and regulations applicable to the project, in addition the table includes relevant International and Industry Guidance that has been consulted in the course of the study.

Table 10 - National Legislation and International and Industry Guidance Documents

TITLE	DESCRIPTION	RELEVANCY TO THE PROJECT
Timor-Leste National Legislation and Regulation		
Constitutions of the Republic Democratic of Timor-Leste Article 61 (Environment)	The article specifies provisions for state including the proponent shall undertake to defend, and safeguard the environment recognizes the right of all citizens to a humane, health and ecologically balances environment while also specifying the duty of everyone to preserve and protect the environment for the benefit of future generation	Provide the basis for environmental protection and safeguarding in the Country
Environmental (Licensing) Decree Law No.5/2011	The procedure for directing the environmental assessment, the review of application for environmental license, issuance and renewal of license. • Categorization of the project category according to severity of the environmental impacts. • Procedures and information requirement for Category A project • Organization and composition of the review committee and its duties and responsibilities. • Specific provisions for public consultation and the protection of the traditional customs and cultural practices. • The issuance of the decision by the Environment Authority on the review of the application and the rights of the project owner to appeal the decision.	Provides the Environmental Licensing procedure to regulate actions to encourage and protect the nature as an important instrument for sustainable development of economy of Timor-Leste
Decree Law No. 5/2016 – National System of Protected Areas (Annex 1 – List of Timor-Leste Protected Areas)	This Decree Law defines the norms and principles for the creation of the national system of terrestrial and marine protected areas, for the classification of protected areas and for the approval of the applicable management instruments, according to the international best practices, in the matter, duly adapted the national reality, without forgetting the important role of community authorities and existing customs.	Provide the basis for the protection of the terrestrial and marine protected areas without putting aside the important role communities, authorities and existing customs.
Decree Law No. 26/2012 on Basic Environmental Law	The Decree Law identifies the protection of the environmental life and wildlife protection, including the basic principles for the conservation, preservation and sustainable use of natural	Communicate to the communities by providing information on the basis for the

	resources in order to improve the quality of life of the local populations.	protection of environment and wildlife protection and sustainable use of natural resources through public consultation
Diploma Ministerial No.44/2017 – Impact Benefit Agreement	The article specifies the process for the agreement between the project proponent and the local community regarding the advantages and disadvantages of the project	As this is a category A project, the IBA will be implemented if it proposed by a member of community to ensure local or community's interest is considered and agreed proposal shall be implemented
Diploma Ministerial No.45/2017 – Rules and Procedures of the Evaluation Committee for Project with Category A	The article specifies the importance of establishing rules and procedures for the evaluation committee for the management of the environmental evaluation process for projects in category A	Establishment of a committee in order to review the project that categorise into category A.
Diploma Ministerial No.46/2017 – Detail requirements of Classification, Initial Assessment and Terms of Reference, Environmental Impact Statement and Environmental Management Plan	The article specifies the necessary of establishing a regulation to regulate projects that may have significant impacts on the environment, while also specifying the procedures and requirements to select projects that classified into category A, B and C.	Provides the environmental licensing and classification of the project into category A.
Diploma Ministerial No.47/2017 – Public Consultation Procedure and Requirement during Environmental Baseline Process	This Diploma Ministerial specifies the procedures and requirement of involvement of public and communities into different stages of the environmental assessment process through public consultation.	Provides information and communicate to the communities by providing information on the basis for the protection of environment and wildlife protection and sustainable use of natural resources through public

		consultation
Decree Law No 27/2020 dated 19 June Organic Law of VIII	Constitutional Article 33 (c) (Minister of Petroleum and Minerals) responsibilities item (o) Considering the complexity and technical expertise of the oil and mineral resources sector, conduct the respective environmental licensing procedures and approve the corresponding environmental licenses in that sector	Provides a description of legal framework that empower Ministry of Petroleum and Minerals to issue environmental license.
Decree-Law No.18/2020 Onshore Petroleum Operations	<p>Applies to Onshore Petroleum Operations including transportation, processing and storage of Crude Oil and Natural Gas with direct impact on any reservoir. In addition covers a broader scope of issues related with onshore activities, notably a legal statute that also addresses environmental and technical aspects related with the carrying out of onshore Petroleum Operations, such as rights of way through, on or over the land destined for Petroleum Operations, installation of pipelines, rules on geological, geophysical or geochemical surveys, environment.</p> <p>This Decree-Law No.18/2020 of 13 May also stipulated on matters pertaining to means and ways of intervention, expropriation, nationalization and privatization of means of production and land on grounds of public interest, as well as criteria for the establishment of compensations in such cases, including the appeal to the Government in case of any land dispute occurred.</p>	Provides the fundamental legal framework for all oil and gas operations onshore Timor Leste
<p>Forestry, Aquaculture and Fishing Legislation:</p> <p>Law No. 14/2017 – General Regime of Forestry</p>	The article outlines the basic principles and standards for the management, protection, conservation and sustainable use of forestry and river basin resources. Moreover, it describes the importance of communities that utilise the forests to their need and prosperity and promoting sustainable development	Provide legal framework of the fundamental norm of the environmental protection and preserving the natural resources existence in the forests for sustainability of the economic development
<p>Labour Legislation</p> <p>Law No. 4/2012 – Timor Leste Labour Code</p>	This law describes the rights between employers and workers in regard to the working hours, leaves, remunerations, compensations and health and safety welfares	Provide basis for the project proponent to set up a working condition and contracts between employer and employee

Land legislation Law No. 13/2017 - Especial Regime for the Definition of Land and Property	This law provides legal jurisdiction of the owners of lands and the individual rights of their private properties according to the Article 54 (1) of the RDTL Constitution	As the legal basis for the project proponent to identify, access and compensate for any land used during the project activities
Waste Management Decree Law No.33/2008 – Hygiene and Public Order Decree Law No. 2/2007 – Urban Residual Waste Management	This law provides legal framework to manage the urban solid waste and ensure promoting the hygiene in the workplace	As the legal basis for the project proponent to manage solid waste are produced during any project phase. This to be set as the minimum criteria for the TR to establish its own waste management system
Cultural Heritage Legislation: Government Resolution No.25/2011 – Protection of Cultural Heritage (Annex 4)	This Government Resolution is used to protect and preserve Timor Leste's cultural heritage until the Cultural Heritage National Law is made available. The resolution defines the type of the cultural heritages; archaeological heritage, architectural heritage, ethnographic and traditional heritage and intangible heritage	The resolution provides scope or boundary of the cultural heritage which has to be considered by project proponent.
International and Industry Guidance Documents		
Western Australian Department of Mines and Petroleum “Guidelines for the Development of an Onshore Oil Spill Contingency Plan 2016”	Provide Guidelines for the development onshore OSCP Provide mitigation measures to oil impacts sourced from the drilling activity.	Provide Guidelines for the development onshore OSCP Provide mitigation measures to oil impacts sourced from the drilling activity.
International Finance Corporation Environmental, Health and Safety Guidelines for Onshore Oil and Gas Development; April 30 th , 2007	The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice. The guidelines are industry specific for onshore oil and gas and are designed to be used together with the General EHS Guidelines document (see below), which provides guidance to users on common EHS issues	Provide guidance on the application of good environmental practice.

	potentially applicable to all industry sectors.	
International Finance Corporation Environmental, Health and Safety General Guidelines; April 30 th , 2007	The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice.	Provide guidance on the application of good environmental practice.
United Nations Convention on Biological Diversity (UNCBD)	<p>The Convention on Biological Diversity (CBD) entered into force on 29 December 1993. It has 3 main objectives:</p> <ol style="list-style-type: none"> 1. The conservation of biological diversity 2. The sustainable use of the components of biological diversity 3. The fair and equitable sharing of the benefits arising out of the utilization of genetic resources 	<p>Timor Leste is rich of the biodiversity with significant ecosystem and endemic species. The country signed the convention in 2001.</p> <p>As the project could have impacts on the flora and fauna or risk to the loss of the biodiversity, it is fundamental principle for the project proponent to prevent or minimise the risk of biodiversity loss during the project implementation</p>
United Nations Framework for Climate Change Convention (UNFCCC)	The United Nations Framework Convention on Climate Change (UNFCCC) provides a framework for intergovernmental efforts to reduce greenhouse gas emissions and adapt to the expected impacts of climate change. It also provides guidance to member states on developing and implementing national climate change strategies, incorporating both adaptation and mitigation actions. Timor-Leste became a signatory to the UNFCCC in October 2006.	<p>The project activities release GHG emissions which could be one of the contributing factors to the country's climate change issue.</p> <p>Minimisation climate change risks by reducing the GHG emissions are an essential part of the project environmental objective and target. This convention is the principle guidance for the project proponent to prevent the air pollutions and reduce the GHG emissions as much as possible.</p>

IOGP Guidelines	The International Association of Oil & Gas Producers (IOGP) is the voice of the global upstream industry. Oil and gas continue to provide a significant proportion of the world's energy to meet growing demands for heat, light and transport. IOGP Members produce 40% of the world's oil and gas. They operate in all producing regions: the Americas, Africa, Europe, the Middle East, the Caspian, Asia and Australia. IOGP serve industry regulators as a global partner for improving safety, environmental and social performance and act as a uniquely upstream forum in which Members identify and share knowledge and good practices to achieve improvements in health, safety, the environment, security and social responsibility.	Provide oil and gas industry specific guidance on the application of good environmental practice.
IPIECA Guideline	IPIECA is a not for profit association that provides a forum for encouraging continuous improvement in industry performance. IPIECA is the only global association involving both the upstream and downstream oil and gas industry. It is also the industry's principal channel of communication with the United Nations. IPIECA develops, shares and promotes good practice and knowledge to help the industry and improve its environmental and social performance. We do this with the understanding that the issues that dominate the sustainable development agenda – climate and energy, environmental and social issues – are too big for individual companies to tackle alone. The industry must work together to achieve improvements that have real impact. IPIECA helps to achieve this goal.	Provide oil and gas industry specific guidance on the application of good environmental practice.
Forestry, Aquaculture and Fishing Legislation: International Union for Convention of Nature (IUCN)	This international convention is and international organisation focus on the nature conservation and sustainable of utilising the natural resources. The IUCN works in the field to promote ecological conservation in order to ensure the sustainable development concepts.	Timor Leste is a signatory member of the IUCN convention which has responsibility to protect its ecological components to ensure the economic sustainable development. Therefore, baseline survey is used to identify all species categories listed under the IUCN red list which can be impacted by the

		project activities
<p>Cultural Heritage Legislation:</p> <p>UNESCO Convention on Natural and Cultural Heritage</p>	<p>The convention mandates each signatory party to identify, protect, conserve, transmit and present to the future generations of the cultural and natural heritage</p>	<p>As the Timor Leste is a signatory member of this convention therefore this project activities ensure the protection and conservation of any cultural and natural heritage around the project locations</p>
<p>Noise and Vibration Standards and Regulation:</p> <p>WHO guideline for community noise</p>	<p>This WHO guideline is used to measure the noise level around the community areas and ensure the protection of people from discomfort environment and potential noise induce hearing loss</p>	<p>This guidance is used to ensure the noise levels arising from the project activities are contained or maintained between the WHO set values to protect everyone at or near the project locations are affected by unwanted sound caused by the project activities.</p>
<p>Air Quality Guidelines:</p> <p>WHO Air Quality Guidelines</p>	<p>WHO Air Quality Guidelines (AQG) offer guidance on threshold limits for key air pollutants that pose health risks and provide a reference for setting air pollution targets at regional and national levels to improve air quality.</p> <p>Air quality guidelines have been published by WHO in 1987 and they were revised in 1997. The 2005 update represents the most current assessment of air pollution health effects, based on an expert evaluation of the scientific evidence. The guidelines offer recommended exposure levels for particulate matter (PM10 and PM2.5), ozone, nitrogen dioxide and sulphur dioxide, as well as a set of interim targets to encourage a progressive improvement in air quality.</p>	<p>The air quality benchmark is used as reference by the project proponent is the WHO air quality guidelines.</p>
<p>Climate Change</p> <p>Kyoto Protocols</p> <p>Government</p>	<p>Kyoto Protocol is an international treaty which extends the UNFCCC parties commitment to reduce the green house gas according to the scientific consensus. The protocol implements the objective of reducing the global warming potential gas in the atmospheres.</p>	<p>Timor Leste is the signatory party of the Kyoto Protocol which shall ensure the implementation of the protocol in order to reduce the GHG</p>

Resolution of National Action Plan for Climate Change	The government resolution of national action plan for climate change (NAPA) is the first national document that identifies urgent and immediate climate change adaptation needs of the most vulnerable groups. It provides a starting point from which climate change adaptation can be mainstreamed into development plans as a key strategy for attaining sustainable development and poverty reduction (DNMG, 2010).	emissions.
Water Resources WHO 2008 Guideline for Drinking Water Quality	These guidelines is used as the reference for the Timor Leste to ensure drinking water quality according to the WHO drinking water quality standard	As the guidance for the project proponent to test and ensure water quality around the proposed project locations before any drilling activities are taken place

6 INSTITUTIONAL ROLES & RESPONSIBILITIES

The following are the roles and responsibilities for all the HSE related aspects of Timor Resources and its drilling contractor management within the project activities.

Table 11. Timor Resources and its contractor personnel roles and responsibilities

POSITION	ROLES AND RESPONSIBILITIES	
	GENERAL RESPONSIBILITIES	SPECIFIC RESPONSIBILITIES
TIMOR RESOURCES		
Chief Executive Officer	Authority for all OMS and HSE issues	<ul style="list-style-type: none"> • CEO is the OMS Champion and the focus for OMS leadership across Company • Provide each level of management the necessary authority and resources to establish and implement the OMS • Signs HSE Policies and ensures compliance • Leads management and KPI reviews • Receives regular reports on progress, incidents, issues to be aware of • Receives updates from HSE Officer as to compliance or non-compliance with legislation, and recommendations to rectify
General Manager Exploration	Overall responsibility for the project	<ul style="list-style-type: none"> • Provides the normal channel of communications with ANPM with regard to Drilling operations. • Responsible for the implementation of the OMS across the Company • Leads in seeking the resolution of HSE issues • Implements and updates the Project Environmental Management Plan • Manages the resolution of project environmental issues •
Drilling Team Leader	Overall responsibility for the drilling operations	<ul style="list-style-type: none"> • Responsible for the implementation of the OMS in drilling operations • Ensures Drilling Contractor meets all OMS obligations • Leads in drilling related Risk Workshops • Reviews Risk Assessment reports and Risk Registers and ensures they are completed, and corrective actions undertaken • Responsible to conduct emergency drills on the rig site.

POSITION	ROLES AND RESPONSIBILITIES	
	GENERAL RESPONSIBILITIES	SPECIFIC RESPONSIBILITIES
Drilling Supervisor or “Company Man”	Overall responsibility for the drill rig operations	<ul style="list-style-type: none"> The Operator’s Company Representative (OCR) on-site working in liaison with Eastern Drilling ED Drilling Manager and rig crew.
Operations Manager	Overall responsibility for operations other than drilling activities	<ul style="list-style-type: none"> Responsible for the implementation of the OMS in all operational areas Make sure that work activities are carried out in a safe and environmentally sound manner Ensures sediment and erosion control measures are in place and functioning Provides advice and assistance on environmental matters to employees Leads in operations related Risk Workshops Reviews Risk Assessment reports and Risk Registers and ensures they are completed, and corrective actions undertaken Make sure records are kept and are up to date
	Supervises all civil engineering contractors on- site	<ul style="list-style-type: none"> Ensures plant & equipment are weed free when entering/leaving site Monitors that vegetation is not disturbed except where approved Ensures work is not conducted outside designated project boundary Based at the operational sites and responsible for the overall compliance with project Environmental Management Plan Communicates HSE information with senior staff and ensures follow-up where necessary. Responsible to conduct emergency drills on the operations team and ensures implementation.

POSITION	ROLES AND RESPONSIBILITIES	
	GENERAL RESPONSIBILITIES	SPECIFIC RESPONSIBILITIES
Country Manager	Overall responsibility for community and government liaison	<ul style="list-style-type: none"> • Liaise and communicate with ED Rig Manager and TR Drilling Team Leader in both verbal and written communication; • Ensure all instructions of rig management work methods and use of equipment are communicated and carried out properly and safely, with due regard for the environment; • Manage and organise public consultation with local authorities and community for any related social and environmental issues or aspects that are mentioned or identified within the project EIS/EMP.
Health, Safety and Environment (HSE) Officer	Site HSE Compliance	<ul style="list-style-type: none"> • Monitors environmental legislative requirements. • Controls all management system documentation • Review and update HSE documents • Observes all environmental acts, rules and regulations • Manages and provides HSE training and inductions for all project employees. • Audits the crew on a regular basis; • Maintains contact with Timor Resources management, participates in HSE meetings
	Site HSE Compliance	<ul style="list-style-type: none"> • Actions HSE report and carries out workplace inspections • Monitors implementation of the OMS across the Company. • Prepares TR Incident Management Plan (IMP) and integrates with Contractor's Site Emergency Response Plan (SERP) and Corporate Crisis Management Plan (CMP), including medical contingency planning / evacuation procedures and emergency contacts etc. • Ensure dissemination of HSE information to all crews, such as audit reports, incidents reports etc. • Ensure proper training of all staff to necessary competence level. • Coordinate the compilation and reporting of all

POSITION	ROLES AND RESPONSIBILITIES	
	GENERAL RESPONSIBILITIES	SPECIFIC RESPONSIBILITIES
		<p>incidents, audits and HSE statistics to Management.</p> <ul style="list-style-type: none"> • Ensure that Timor Resources HSE standards and requirements are applied equally throughout the operation by all contractors. • Keep fully apprised of ongoing HSE concerns in both the office and field environments. • Participate in incident investigations and ensure that investigations are thoroughly carried out and actions followed up,. • Liaison between contractor management and Timor Resources HSE for HSE issues. • Follows all HSE guidelines and provides a good example for all employees to follow • Assists the Operations and Management in the implementation of all aspects of the project EMP • Compile and document all HSE reports and statistics • Conducting audits and all HSE improvement plans, generating the reports to be distributed internally and to relevant authorities • Ensure that all the activities are in compliance with the environmental legislative requirements. • Controls all OMS documentation • Organise and participates in HSE drills and exercises • Communicates HSE requirements through the reporting line
EASTERN DRILLING		
Drilling Manager	Overall responsibility for the drilling activities	<ul style="list-style-type: none"> • Responsible for the day to day operations of the rig and is the formal single point of contact with TR Drilling Supervisor/Company Man • Responsible for liaison and negotiations with TR on all operational matters. • Ensure adequate resources and support are applied to meet SC requirements • All requirements are met with regard to the technical standard of the rig its equipment and certification • Operational and HSE management of the rig is

POSITION	ROLES AND RESPONSIBILITIES	
	GENERAL RESPONSIBILITIES	SPECIFIC RESPONSIBILITIES
		<p>planned and organised in accordance with ED policies and in compliance with HSE requirements</p> <ul style="list-style-type: none"> • All personnel onboard the rig are adequately trained and experienced to perform the tasks they are assigned • Contractors evaluation, selection and management are done in accordance with ED and TR procedures
Rig Superintendent	Accountable to the Drilling Manager for maintaining safe working conditions on the rig site	<ul style="list-style-type: none"> • Overall safety of the rig, and for the health and welfare of all the persons on the rig. • Compliance with all relevant regulatory requirements. • Ensuring that the correct level of supervision is in place at all times. • Organising safety and emergency drills, according to requirement set in HSE MS. • Ensuring that the rig personnel maintain competence in the execution of their duties • Communicates with and assists onsite representative on a daily basis to implement and promote procedures and goals. • Organise and delegate responsibilities and authority to the Toolpushers, Mechanic, Electricians and Safety Supervisors. • Supervises all the daily activities on the rig
Tool Pusher – Night shift		<ul style="list-style-type: none"> • Ensures the drilling operations are being conducted at maximum efficiency in the safest manner during night time hours • Perform activities organised by the Rig Superintendent
HSE Officer		<ul style="list-style-type: none"> • Reports to Rig Superintendent • Responsible to promote, implement, supervise all company HSE management on daily operational

7 SUMMARY OF IMPACTS

The project impacts were discussed in detail in the EIA with the Environmental Components presented in Section 9.3, the Social impacts addressed in Section 10, and the Economic impacts in Section 11 respectively.

The negative impacts and their impact rating are summarised here in Table 12 and positive impacts in Table 13. Impact mitigation measures and residual impacts are described below in Section 8.

Table 12 - Summary of Impacts and Impact Rating

NO	IMPACT	INITIAL IMPACT RATING	RESIDUAL IMPACT AFTER MITIGATION
1.	Land Use All Phases	Minor 5	Negligible
2.	Traffic All Phases	Moderate 9	Minor
3.	Soil All Phases	Minor 7	Minor
4.	Air Quality Construction	Moderate 9	Minor
5.	Air Quality Operations	Minor 7	Minor
6.	Air Quality Decommissioning	Moderate 9	Minor
7.	Surface Water All Phases	Minor 4	Negligible
8.	Groundwater All Phases	Minor 5	Negligible
9.	Operational Leaks and Spills All Phases	Minor 4	Negligible
10.	Worst Case Oil Spill Operations	Moderate 8	Moderate
11.	Water Supply All Phases	Negligible 2	Negligible
12.	Biodiversity, Flora and Fauna All Phases	Minor 5	Negligible
13.	Liquid Effluents All Phases	Minor 7	Minor
14.	Solid Waste All Phases	Moderate 9	Minor
15.	Noise Construction	Minor 7	Minor
16.	Noise Operations	Minor 6	Minor
17.	Noise Decommissioning	Minor 7	Negligible
18.	Light, Odours and Heat	Minor 5	Negligible
19.	Community	Minor 8	Negligible
20.	Visual	Negligible 4	Negligible

Table 13. Summary of Positive Impacts

NO	IMPACT	SCOPE
1.	Employment	<p>Construction (Timorese labour component 88) There will be several employment opportunities during the construction phase for: community consultation, community liaison officers, civil construction crews, civil engineers, concreters, heavy vehicle drivers, light vehicle drivers, supervisors, engineers, mechanics, electrician surveyors, labourers, accommodation manager, security, administration, accounting service, cooks, cleaners, security, geologists, administration, accounting, operations management, work team supervisors.</p> <p>Operations (Timorese labour component 114) Additional employment during the operations phase includes rig related labour, inclusive of drilling crew, derrickmen, roustabouts, company men, geologists, security, labourers, and crew. In addition, the following positions remain important: concreters, heavy vehicle drivers, light vehicle drivers, supervisors, engineers, mechanics, electricians, surveyors, labourers, accommodation manager, security, administration, accounting service, cooks, cleaners, administration, accounting, operations management, work team supervisors.</p> <p>Decommissioning (Timorese labour component 88) Company men, geologists, security, labourers, and crew. In addition, the following positions remain important: heavy vehicle drivers, light vehicle drivers, supervisors, engineers, mechanics, electricians, surveyors, labourers, accommodation manager, administration, accounting service, cooks, cleaners, administration, accounting, operations management, work team supervisors.</p>



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NO	IMPACT	SCOPE
2.	Procuring Goods and Services	<p>Procurement from Timorese owned and operated businesses in the contract area goods and services include but are not limited to;</p> <ol style="list-style-type: none">1. Fresh Food and water2. Accommodation Housing/Office Supply3. Diesel Supply4. Import Services for customs clearance5. Rental of Heavy Equipment, trucks, cranes6. Environmental Consultancy Engagement7. Aggregate and rock base
3.	Customs Duties and Taxes	<p>The use and consumption of various specialist drilling materials, such as machinery, mud components, drill bits, etc. will attract taxes and customs duties, which will be payable to the government hence increasing government revenue while the cost of these materials will be payable directly to the producers.</p>
4.	Community Programs	<p>Timor Resources has implemented a number of community programs, including horticulture, gifted seeds, irrigation and financial support. The supply of irrigation and water infrastructure has been the focus of Company support during seismic and is continuing during the drilling campaign.</p> <p>Support for local sporting competitions, teams and local events is another community contribution. The sponsoring of the Manufahi Cup, the Tour de Dili, and the local community football and soccer federations.</p> <p>Infrastructure within the area is set to improve especially the roads leading to the sites after improvement eases access of transportation. The roads to the sites will also serve other residents who are set to benefit from this infrastructure development brought by the project.</p>

8 PROPOSED MITIGATION MEASURES

Table 14 - Summary of Negative Impacts and Mitigation

NO	IMPACT	IMPACT RATING	PROPOSED MITIGATION MEASURES	RESIDUAL IMPACT
1.	Land Use All Phases	Minor 5	<ul style="list-style-type: none"> • Contact local stakeholders early in the process to identify sensitive land areas, land uses, issues, and local plans and any local regulations. • Site the project on previously disturbed land whenever possible. • Depending on the individual site, consider steps to minimise the amount of vehicular traffic and human activity. • Provide adequate public notice of planned activities. • Establish a rehabilitation plan that addresses both interim and final rehabilitation requirements and agree after-use if applicable. Ensure that interim rehabilitation of disturbed areas is conducted as soon as possible. • Compensate farmers for crop damage and restore compacted soils. 	Negligible
2.	Traffic All Phases	Moderate 9	<ul style="list-style-type: none"> • Plan to use existing roads to the maximum extent possible. • Prepare an access road siting study and management plan to guide road design and maintenance standards, coordinate closely with Municipality and national government authorities responsible for maintaining roadways and bridges. Compare the number, size, and weight of loads to service projects to the existing road infrastructure to determine if roads and bridges are adequate to support intended loads. • Implement strict traffic management procedures in association with the Municipality. • Route project traffic to minimise impacts on local communities. • Issue notices/advisories of pending traffic inconveniences and conduct briefing meetings with local authorities, schools and residents before the commencement of works. • Flagmen should be employed to control traffic and assist all vehicles as they enter and exit. 	Minor

NO	IMPACT	IMPACT RATING	PROPOSED MITIGATION MEASURES	RESIDUAL IMPACT
			<ul style="list-style-type: none"> • Maintain on site a record of incidents and accidents. • Ensuring that all drivers for the project understand and comply with speed limits. • Ensure all vehicles and machinery used for the project are in good working condition both legally and are fit for purpose. • Control dust along un-surfaced roads, especially near residences, schools and fields. • Limit all traffic movement through villages in particular school opening and closing times. 	
3.	Soil All Phases	Minor 7	<p>Construction</p> <ul style="list-style-type: none"> • Restricting removal of vegetation and soil cover to those areas necessary for the project. • Remove all topsoil and store off site. • Manage storm and flood flash water effectively to avoid movement of loss soils. • The disturbed areas should be rehabilitated with indigenous vegetation as soon as possible to prevent soil erosion if it was necessary. • Work areas should be clearly defined and demarcated, where necessary to avoid unnecessary disturbance on areas outside the project footprint. • Preventing pollution of ground from servicing of vehicles and wastes by having specific sites for collection, sorting and transport of wastes. • Construction vehicles should remain on designated roads and should avoid off-site driving. • Compacting area with loose soils. <p>Decommissioning</p> <ul style="list-style-type: none"> • Soil originally removed in the construction phase and stored will be returned upon restoration of the drill site and access road if necessary. • Drains will be installed, and drainage patterns will be re-established to prevent erosion. • Well sites and roads are either left to an agreed after-use or rehabilitated following drilling. If the well is successful, the area will be reduced to the minimum size necessary 	Minor



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NO	IMPACT	IMPACT RATING	PROPOSED MITIGATION MEASURES	RESIDUAL IMPACT
			<ul style="list-style-type: none">in discussion with the authorities and the landowner.During restoration and rehabilitation of the well site and roads, the site will be ripped before returning of the stockpiled topsoil.Soil profile and contours will be reinstated upon completions of decommissioning phase.	
4.	Air Quality Construction	Moderate 9	<ul style="list-style-type: none">Sprinkling water on soil before excavation and periodically when operations are under way to prevent raising of dust.Use of low sulphur fossil fuel.Controlling the speed and operation of construction vehicles; drivers should adhere to the speed limit of 20 km/hr on access roads and 40 km/hr blacktop.Regular maintenance and services of machines and engines.In order to control exhaust, educate and raise awareness of construction workers on emission reduction and on emissions that are likely to occur during the construction of the well pads and access roads leading to the sites, the following measures shall be implemented during construction:<ul style="list-style-type: none">Vehicle idling time shall be minimisedEquipment shall be properly tuned and maintained.To minimise air pollution due to dust emission or transport of waste materials during construction, the waste materials must be transported in covered vehicles especially if the route is through frequently used roads.Workers in dusty areas on the site need to be issued with PPE such as, dust masks and safety goggles during dry and windy conditions.Sensitise truck drivers to avoid unnecessary racing of machinery engines at loading, offloading sites, and parking areas and encourage them to keep the vehicle engines off at these points.	Minor

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NO	IMPACT	IMPACT RATING	PROPOSED MITIGATION MEASURES	RESIDUAL IMPACT
5.	Air Quality Operations	Minor 7	<ul style="list-style-type: none"> Sprinkling water on access roads to reduce dust. Use of low sulphur fossil fuel. Speed limit on access road 20 km/hr on access roads and 40 km/hr blacktop. Regular maintenance and services of machines and engines. In order to control exhaust, educate and raise awareness of drivers on emission reduction and on emissions that are likely to occur during operations, the following measures shall be implemented during construction: <ul style="list-style-type: none"> Vehicle idling time shall be minimised Equipment shall be properly tuned and maintained Sensitise truck drivers to avoid unnecessary racing of machinery engines at loading, offloading sites, and parking areas and encourage them to keep the vehicle engines off at these points. 	Minor
6.	Air Quality Decommissioning	Moderate 9	<ul style="list-style-type: none"> Covering of all haulage vehicles carrying debris for dumping at approved sites. Stockpiles of fine materials should be wetted or covered with tarpaulin during windy conditions. Workers in dusty areas on the site should be issued with dust masks and safety goggles. Using well maintained equipment and machines with efficient engines meaning low emissions. Using dust screens. 	Minor
7.	Surface Water All Phases	Minor 4	<ul style="list-style-type: none"> Minimise the planned amount of land to be disturbed as much as possible by use of existing roads. Identify and avoid unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure). Construct drainage ditches only where necessary. Use appropriate structures at culvert outlets to prevent erosion. 	Negligible



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			<ul style="list-style-type: none">• Refuel in a designated fuelling area that includes a temporary berm to limit the spread of any spill.• Refuel in a designated fuelling area that includes a temporary berm to limit the spread of any spill.• Closely monitor construction near aquifer recharge areas to reduce potential contamination of the aquifer;• Any discharge of grey water should be treated first to avoid contaminating water sources.• Upon completion of the decommissioning phase, disturbed areas will be contoured and vegetated to minimise the potential for soil erosion and water quality related impacts.• Temporary sediment and erosion control measures such as sediment fences installed where necessary especially in areas in close proximity to drains or surface water features to avoid runoff to water source.• Any area artificially elevated via pad or access track construction will be lowered to original ground level by removal of paving material unless otherwise instructed by the landowners.• Original drainage patterns will be restored.	
8.	Groundwater All Phases	Minor 5	<ul style="list-style-type: none">• The freshwater aquifer at approximately 84m is cased off immediately after passing through before drilling continues• Mud chemicals are non-toxic with the exception of biocide, but this is used in low quantities.	Negligible
9.	Operational Leaks and Spills All Phases	Minor 4	<ul style="list-style-type: none">• Rig design incorporates leak minimisation and drainage containment systems to ensure that spillages do not enter the environment.• All chemicals and fuel on site will be stored in bunded impermeable areas with adequate shading.• Correct storage, handling, use and transportation of chemicals will be followed according	Negligible



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			<p>to manufacturer's specifications, material safety data sheets and regulations.</p> <ul style="list-style-type: none">• Provide a Hazardous Substance SOP for chemicals management in compliance with company rules and national standards.• No disposal of unused chemicals, all excess materials will be quantified and recorded and returned to the vendors.• Prepare spill contingency plans.	
10.	Worst Case Oil Spill Operations	Major 8	<ul style="list-style-type: none">• Detailed well design aimed at prevention of any loss of control during drilling.• Preventative measures and equipment integral in well design, including drilling fluids (mud) and blow-out preventer, well control procedures. See Project Safety Case.• Prepare oil spill contingency plan.	Moderate
11.	Water Supply All Phases	Negligible 2	<ul style="list-style-type: none">• Procure adequate water for the operations with a high yield.• Ensure no water use competition with the local community.	Negligible
12.	Flora, Fauna and Habitat. Biodiversity All Phases	Minor 5	<ul style="list-style-type: none">• Education on the importance of flora and fauna in the areas, including the appropriate regulatory requirements• Rapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the reestablishment of plant cover is desirable to prevent erosion if it was necessary.• Implement a tree planting program to offset loss of trees due to the construction phase• Clearing vegetation only in construction areas and demarcating areas where no clearing will happen.• Vehicles coming into the site must use designated roads.• Apply spill prevention practices and response actions in refuelling and vehicle-use areas to minimize accidental contamination of habitats.• Address spills immediately per the appropriate spill management plan, and initiate soil clean-up and soil removal if needed.	Negligible

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NO	IMPACT	IMPACT RATING	PROPOSED MITIGATION MEASURES	RESIDUAL IMPACT
			<ul style="list-style-type: none"> • Turn off all unnecessary lighting at night to avoid disturbing wildlife and migratory birds. • Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance. • Schedule decommissioning activities to avoid disturbance of resources during critical periods, for example night, or year, for example breeding, nesting seasons. • Rehabilitate all the areas of disturbed soil using weed free native grasses and shrubs. • Undertake rehabilitation activities as early as possible on disturbed areas in consultation with the relevant authorities, e.g. Forestry Department. 	
13.	Liquid Effluents All Phases	Minor 7	<ul style="list-style-type: none"> • Open drains on the rig floor will collect any oily residues and discharge to the mud pit. • Rainwater is routed via the perimeter drain to an interceptor where oil is separated. • Sewage will be collected and treated in a standard field septic system and the effluent discharged to the ground through a trickle feed weeping tile. • The drilling rig will have a test separator to process any produced fluid from well testing operations. Any produced liquids will be stored in tanks and transported to existing facilities for processing. • Compliance with Municipality on waste matters. • Employing a waste management plan. 	Minor
14.	Solid Waste All Phases	Moderate 9	<ul style="list-style-type: none"> • Work in concert with the Municipality to develop and implement a fit for purpose waste management plan. • Assess and create opportunities for Reducing, Reusing, and Recycling of waste generated. • Municipality making available suitable facilities for the collection, segregation, storage and safe disposal of the wastes. • Create waste collection areas for segregation of waste with clearly marked facilities such as colour coded bins. The bins to be coded according to biodegradable and non-biodegradable, reuse, recycling and reduce. 	Minor

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NO	IMPACT	IMPACT RATING	PROPOSED MITIGATION MEASURES	RESIDUAL IMPACT
15.	Noise Construction	Minor 7	<ul style="list-style-type: none"> • Restrict construction activities to normal working hours 0800hrs to 1700hrs • Inform local residents beforehand, via notices and advisories, of pending noisy periods and solicit their tolerance well before the commencement of demolition works. • Machinery should be maintained regularly to reduce noise resulting from friction during operations. • Drivers to adhere to speed limits within the project site access roads and vicinity • A grievance procedure will be established whereby noise complaints by neighbours are recorded and responded to. • Restrict hooting of vehicular horns. • Locate all stationary construction equipment (i.e., compressors and generators) as far as practicable from any nearby sensitive receptors. • Shielding the area to reduce noise propagation at Raiketan as necessary. 	Minor
16.	Noise Operations	Minor 6	<ul style="list-style-type: none"> • Machinery should be maintained regularly to reduce noise resulting from friction during operations. • A grievance procedure will be established whereby noise complaints by neighbours are recorded and responded to. • Muffle and maintain all construction equipment used. • Using modern machinery equipment with noise suppressing technologies in order to reduce the noise-rating as much as possible. 	Minor
17.	Noise Decommissioning	Minor 7	<ul style="list-style-type: none"> • Restrict decommissioning activities to normal working hours 0800hrs to 1700hrs • Inform local residents beforehand, via notices and advisories, of pending noisy periods and solicit their tolerance well before the commencement of demolition works. • Machinery should be maintained regularly to reduce noise resulting from friction during operations. • Drivers to adhere to speed limits within the project site access roads and vicinity 	Negligible



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NO	IMPACT	IMPACT RATING	PROPOSED MITIGATION MEASURES	RESIDUAL IMPACT
			<ul style="list-style-type: none"> A grievance procedure will be established whereby noise complaints by neighbours are recorded and responded to. Restrict hooting of vehicular horns. Locate all stationary construction equipment (i.e., compressors and generators) as far as practicable from any nearby sensitive receptors. Limit pick-up trucks and other small equipment to an idling time, observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible. Shielding the area to reduce noise propagation at Raiketan as necessary. 	
18.	Light, Heat and Odours	Minor 5	<ul style="list-style-type: none"> The site occupies a small area will be in place temporarily. Any important sensitivity in the project areas (e.g. infrastructures, areas of significant vegetation cover, sensitive cultivations, important sites for cultural heritage, etc.) will be identified and avoided as appropriate. Use a lower level of lighting i.e. sufficient to enhance the night-time visibility required for safety and security Use specifically designed lighting equipment that minimises the upward spread of light near to and above the horizontal. Shading floodlights to only shine inside the site perimeter Turn off all unnecessary lighting at night to avoid disturbing wildlife and migratory birds. 	Negligible
19.	Community All Phases	Minor 8	<ul style="list-style-type: none"> Consultation with the Municipality and liaison with community during the planning phase. Establish a robust, open, two way Complaints/Grievance Mechanism. Establishing emergency procedures and ensuring the community are aware and educated on following them and commensurate to the magnitude and type of risk. The work site(s) will be fenced off to protect the general public from dangers associated with the drilling operations, including security in and around the site to control the 	Negligible



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NO	IMPACT	IMPACT RATING	PROPOSED MITIGATION MEASURES	RESIDUAL IMPACT
			<ul style="list-style-type: none">movement of people.Placing visible and readable warning signs around the work sites and access roads where there are exposures.Compliance with Timor Resource's local content policy that reflects the requirement to hire locally, including a transparent and accessible application and short-listing process of workers.Where possible, look into vocational training programs for the local workforce to promote development of skills required by the oil and gas industry.	
20.	Visual	Negligible 4	<ul style="list-style-type: none">The site occupies a small area and the drilling facilities will be in place temporarily.The project is limited spatially to the one-hectare drilling location and its immediate surrounds and is short term and transient in nature.Any important sensitivity in the project areas (e.g. infrastructure, areas of significant vegetation cover, sensitive cultivations, important sites for cultural heritage, etc.) will be identified and avoided as appropriate.	Negligible

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9 REGULATING PARAMETERS

9.1 TIMOR RESOURCES OPERATING MANAGEMENT SYSTEM

Project activities will be managed in accordance with applicable Timor Leste laws and regulations and follow the Timor Resource Operating Management System (OMS) and Eastern Drilling Health, Safety and Environmental Management System (HSE-MS). Any contradictions between TR and ED's HSE-MS will be bridged through HSE Bridging Document.

The mitigation measures identified for the management of potential environmental impacts will be integrated into the project design through the OMS. Implementation will follow Timor Resources HSE Policy and the OMS and meet Timor Leste legislation and regulations, in particular, Environmental Basic Law No 26/2012, Environmental Licensing Decree Law 5/2011 (and supporting Ministerial Diplomas 45/46/47) and Decree-Law No.18/2020 Onshore Petroleum Operations.

The key OMS elements for implementation of the mitigation measures are included under:

- Element 7 Operational Controls:
 - Health, Safety and Environmental Management
 - Management of Change
 - Contractor and Purchasing Management
 - Asset Integrity, Engineering and Project Management
- Element 9 Crisis and Emergency Management
- Element 10 Assurance
 - Inspection and Audit
 - Non-Conformance Corrective and Preventative Action
- Element 11 Performance and Compliance

The EMP will follow the Timor Resources OMS “*Plan - Do - Check - Act*” PDCA cycle appropriate to the nature and scale of the project and the impacts identified and summarised in this EIA by:

- Adopting a mitigation hierarchy to anticipate, avoid, minimise and, where residual impacts remain, offset impacts to the environment and affected communities.
- Ensuring that all grievances from the community are responded to and managed appropriately.
- Promoting and providing adequate engagement with communities throughout the project on issues that could potentially affect them and ensuring that relevant information is disclosed and shared.

The EMP will outline the actions and outcomes required to address the issues raised in the EIA, and include performance standards, targets and time frames, and assigning responsibilities for implementation.

A grievance mechanism will be established to resolve concerns promptly, following an understandable and transparent consultative process that is readily accessible, at no cost and without retribution to the party that originated the issue or concern.

9.2 INDUSTRY BEST PRACTICE

Application of applicable Industry Best Practice is a requirement under Decree Law 18/2020 Onshore Petroleum Operations - Article 123 Health and Safety Monitoring. Table 18 below provides a summary of international and industry best practice that is applied in this EMP.

9.3 AIR QUALITY STANDARD

Table 15. WHO Ambient Air Quality Guidelines
Source: WHO air quality guideline global update 2005

	AVERAGING PERIOD	GUIDELINE VALUE µg/m ³
Sulphur dioxide (SO ₂)	24-hour mean	20 (guideline)
	10-minute mean	500 (guideline)
Nitrogen dioxide (NO ₂)	Annual mean	40 (guideline)
	1-hour mean	200 (guideline)
Particulate Matter PM ₁₀	Annual mean	20 (guideline)
	24-hour mean	50 (guideline)
Particulate Matter PM _{2.5}	Annual mean	10 (guideline)
	24-hour	25 (guideline)
Ozone	8-hour mean	100 (guideline)

9.4 WATER QUALITY STANDARD

Water and soil samples were taken according to the WHO standards presented below, with water physical tests conducted onsite such as pH, Conductivity, Salinity, Total Dissolved Solid (TDS) and Total Suspended Solid (TSS). Water chemical and bacteriological tests were conducted in the laboratory and all tests were based on the WHO drinking water quality guidelines as referred by the Ministry of Health.

Table 16- Water Quality Test Parameters (TR-ToR, 2019)
Source: WHO drinking water standards (2011)

PARAMETERS	UNIT	WHO/TIMOR-LESTE GUIDELINE
Physical Test		
pH value	pH meter	6.5 - 8.5
E. Conductivity	µs/cm	100 µs - 1 ms/cm
TSS	mg/L	
TDS	mg/L	1,000
Salinity	%	
Temperature	°C	
Turbidity	NTU	5
Chemical Test		
NH ₃ -N	mg/L	1.5
NO ₃ -N	mg/L	50
NO ₂ -N	mg/L	3
Iron (Fe)	mg/L	0.3
Manganese (Mn)	mg/L	0.5
Fluoride	mg/L	1.5
Chloride (Cl-)	mg/L	250
Free Chlorine	mg/L	5
Ca Hardness	mg/L	2.5
Total Hardness	mg/L	200
Total Alkalinity	mg/L	500
Sulphate (SO ₄)	mg/L	250
Arsenic	mg/L	0.1
Bacterial Test		
Total Coliform	CFU/100ml	0
E.Coli	CFU/100ml	0

9.5 NOISE STANDARD

Table 17. WHO Guideline values for community noise in specific environments

Source: <https://www.who.int/docstore/peh/noise/ComnoiseExec.htm>

SPECIFIC ENVIRONMENT	CRITICAL HEALTH EFFECT(S)	L _{Aeq} [dB(A)]	TIME BASE [HOURS]	L _{Amax} fast [dB]
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
School class rooms & pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	during class	-
Pre-school bedrooms, indoor	Sleep disturbance	30	sleeping-time	45
School, playground outdoor	Annoyance (external source)	55	during play	-
Hospital, ward rooms, indoors	Sleep disturbance, night-time	30	8	40
	Sleep disturbance, daytime and evenings	30	16	-
Hospitals, treatment rooms, indoors	Interference with rest and recovery	#1		
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons:<5 times/year)	100	4	110
Public addresses, indoors and outdoors	Hearing impairment	85	1	110
Music and other sounds through headphones/earphones	Hearing impairment (free-field value)	85 #4	1	110
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults)	-	-	140 #2
	Hearing impairment (children)	-	-	120 #2
Outdoors in parkland and conservations areas	Disruption of tranquility	#3		

Note:

#1: As low as possible.

#2: Peak sound pressure (not LAF, max) measured 100 mm from the ear.

#3: Existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low.


#4: Under headphones, adapted to free-field values.

9.6 SOILS

Soil laboratory tests were performed on the selected samples, recovered during the field investigation phase of this study, to verify field classifications and to estimate the index and engineering properties of the subsurface materials. All tests followed applicable ASTM procedures or equivalent (Geo-technical Investigation Testing).

In addition, 18 samples were collected and analysed by PT GEO INTI Synergy Jakarta Indonesia for chemical analysis. The samples were analysed using electrometric for pH and spectrometric for other chemical elements. Elements examined included pH, Co, Ca, Mg.

The data forms the basis against which any future monitoring may be conducted.

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10 MONITORING PROGRAM

The project Environmental Management Plan is presented in Table 18 which summarises the following:

- Impacts
- Impact Rating prior to mitigation
- Mitigation Measures
- Residual Impact Rating after mitigation
- EMP monitoring/performance indicators
- Responsibilities
- Timing and frequency
- The related performance standard.

A key part of the EMP is the requirement to monitor to ensure that the mitigation measures are effective. The monitoring program details the parameters that are to be measured, termed “Monitoring/Performance Indicators”, as well as who is responsible for the measurement and the timing or frequency of the measure.

The EMP also identifies the applicable ‘Performance Standard’, e.g. the legislation and/or best practice standard, against which the monitoring is conducted to ensure compliance with Timor Leste legislation and applicable industry best practice standards, as described in Section 9 – Regulating Parameters within this document.

Table 19 provides a summary of monitoring activities for all project phases excluding the decommissioning (P&A) stage.

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Table 18 - Environmental Management Plan

No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
1.	Land Use All Phases	Minor	<ul style="list-style-type: none"> Contact local stakeholders early in the process to identify sensitive land areas, land uses, issues, and local plans and any local regulations. Site the project on previously disturbed land whenever possible. Depending on the individual site, consider steps to minimise the amount of vehicular traffic and human activity. Provide adequate public notice of planned activities. Establish a rehabilitation plan that addresses both interim and final rehabilitation requirements and agree after-use if applicable. Ensure that interim rehabilitation of disturbed areas is conducted as soon as possible. Compensate farmers for crop damage and restore compacted soils. 	Negligible	Grievance/ Complaints records	Community Affairs Officer	Continuous	TR Grievance mechanism International Best Practice: IOGP (E&P Forum) and UNEP (1997). Environmental Management in Oil & Gas Exploration and Production 1997. IOGP Report No. 254
2.	Traffic All Phases	Moderate	<ul style="list-style-type: none"> Plan to use existing roads to the maximum extent possible. Prepare an access road siting study and management plan to guide road design and maintenance standards, coordinate closely with Municipality and national government authorities responsible for maintaining roadways and bridges. Compare the number, size, and weight of loads to service projects to the existing road infrastructure to determine if roads and bridges are adequate to support intended loads. 	Minor	Adherence to Traffic Management Procedure Journey Management Speed Monitoring Engine and	Operations Manager	Daily Daily Daily Monthly	TR Traffic Management Plan Grievance mechanism International Best practice: IOGP Land Transportation Safety Recommended Practice 365 November 2016 Issue relevant Reports and



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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
			<ul style="list-style-type: none"> Implement strict traffic management procedures in association with the Municipality. Route project traffic to minimise impacts on local communities. Issue notices/advisories of pending traffic inconveniences and conduct briefing meetings with local authorities, schools and residents before the commencement of works. Flagmen should be employed to control traffic and assist all vehicles as they enter and exit the project site. Maintain on site a record of incidents and accidents. Ensuring that all drivers for the project understand and comply with speed limits. Ensure all vehicles and machinery used for the project are in good working condition both legally and are fit for purpose. Control dust along un-surfaced roads, especially near residences, schools and fields. Limit all traffic movement through villages in particular school opening and closing times. 		generator service records Driver training Defensive driving		Induction	Standard Operating Procedures Accident and Incident Reports
3.	Soil All Phases	Moderate	<ul style="list-style-type: none"> Construction Restricting removal of vegetation and soil cover to those areas necessary for the project. Remove all topsoil and store off site. Manage storm and flood flash water effectively to avoid movement of loss soils. The disturbed areas should be rehabilitated with indigenous vegetation as soon as possible to 	Minor	Regular Inspection of road culverts and rig drainage system Adherence to Site Civils	Operations Manager Civils Construction	Weekly Monthly	International Best Practice: - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a)



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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
			<p>prevent soil erosion if it was necessary.</p> <ul style="list-style-type: none">• Work areas should be clearly defined and demarcated, where necessary to avoid unnecessary disturbance on areas outside the project footprint.• Preventing pollution of ground from servicing of vehicles and wastes by having specific sites for collection, sorting and transport of wastes.• Construction vehicles should remain on designated roads and should avoid off-site driving.• Compacting area with loose soils.• Decommissioning• Soil originally removed in the construction phase and stored will be returned upon restoration of the drill site and access road if necessary.• Drains will be installed, and drainage patterns will be re-established to prevent erosion.• Well sites and roads are either left to an agreed after-use or rehabilitated following drilling. If the well is successful, the area will be reduced to the minimum size necessary in discussion with the authorities and the landowner.• During restoration and rehabilitation of the well site and roads, the site will be ripped before returning of the stockpiled topsoil.• Soil profile and contours will be reinstated upon completions of decommissioning phase.		Construction Procedure	Engineer		

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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
4.	Air Quality Construction	Moderate	<ul style="list-style-type: none"> Sprinkling water on soil before excavation and periodically when operations are under way to prevent raising of dust. Use of low sulphur fossil fuel. Controlling the speed and operation of construction vehicles; drivers should adhere to the speed limit of 20 km/hr on access roads and 40 km/hr blacktop. Regular maintenance and services of machines and engines. In order to control exhaust, educate and raise awareness of construction workers on emission reduction and on emissions that are likely to occur during the construction of the well pads and access roads leading to the sites, the following measures shall be implemented during construction: <ul style="list-style-type: none"> Vehicle idling time shall be minimised Equipment shall be properly tuned and maintained. To minimise air pollution due to dust emission or transport of waste materials during construction, the waste materials must be transported in covered vehicles especially if the route is through frequently used roads. Workers in dusty areas on the site need to be issued with PPE such as, dust masks and safety goggles during dry and windy conditions. Sensitise truck drivers to avoid unnecessary racing of machinery engines at loading, offloading sites, and parking areas and 	Minor	Dust management Particulates Monitoring Fuel Consumption Engine and generator service records	Civils contractor for construction Civils Contractor Transport Contractor for service vehicles Transport Contractor	Daily Monthly Daily Monthly	TR Air Quality Management Plan World Health Organisation (2005). WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide. Global update 2005 - Summary of Risk Assessment. World Health Organisation (2018). WHO Fact Sheet Ambient (outdoor) air pollution. 2 May 2018. International Best Practice: <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b) - IFC Performance Standard 1 (PS 1) - Assessment and Management of



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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
			encourage them to keep the vehicle engines off at these points.					Environmental and Social Risks (IFC 2012).
5.	Air Quality Operations	Moderate	<ul style="list-style-type: none"> • Sprinkling water on access roads to reduce dust. • Use of low sulphur fossil fuel. • Speed limit on access road 20 km/hr on access roads and 40 km/hr blacktop. • Regular maintenance and services of machines and engines. • In order to control exhaust, educate and raise awareness of drivers on emission reduction and on emissions that are likely to occur during operations, the following measures shall be implemented during construction: <ul style="list-style-type: none"> ○ Vehicle idling time shall be minimised ○ Equipment shall be properly tuned and maintained • Sensitise truck drivers to avoid unnecessary racing of machinery engines at loading, offloading sites, and parking areas and encourage them to keep the vehicle engines off at these points. 	Minor	Dust management Generator fuel consumption Particulates Monitoring Fuel Consumption Engine and generator service records	Drilling contractor Drilling Contractor for rig emissions/ Transport contractor for service vehicles Transport Contractor Drilling contractor	Daily Daily Monthly Daily Monthly	TR Air Quality Management Plan World Health Organisation (2005). WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide. Global update 2005 - Summary of Risk Assessment. World Health Organisation (2018). WHO Fact Sheet Ambient (outdoor) air pollution International Best Practice: <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b) - IFC Performance



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								Standard 1 (PS 1) - Assessment and Management of Environmental and Social Risks (IFC 2012).
6.	Air Quality Decommissioning	Moderate	<ul style="list-style-type: none"> Covering of all haulage vehicles carrying debris for dumping at approved sites. Stockpiles of fine materials should be wetted or covered with tarpaulin during windy conditions. Workers in dusty areas on the site should be issued with dust masks and safety goggles. Using well maintained equipment and machines with efficient engines meaning low emissions. Using dust screens. 	Minor	Dust management Particulates Monitoring Engine and generator service records	Civils contractor Civils contractor Transport contractor for service vehicles	Daily Monthly Monthly	TR Air Quality Management Plan World Health Organisation (2005). WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide. Global update 2005 - Summary of Risk Assessment. World Health Organisation (2018). WHO Fact Sheet Ambient (outdoor) air pollution International Best Practice: <ul style="list-style-type: none"> Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) EHS General



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								Guidelines (IFC 2007b) - IFC Performance Standard 1 (PS 1) - Assessment and Management of Environmental and Social Risks (IFC 2012).
7.	Surface Water All Phases	Minor	<ul style="list-style-type: none"> Minimise the planned amount of land to be disturbed as much as possible by use of existing roads. Identify and avoid unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure). Construct drainage ditches only where necessary. Use appropriate structures at culvert outlets to prevent erosion. Refuel in a designated fuelling area that includes a temporary berm to limit the spread of any spill. Refuel in a designated fuelling area that includes a temporary berm to limit the spread of any spill. Closely monitor construction near aquifer recharge areas to reduce potential contamination of the aquifer; Any discharge of grey water should be treated first to avoid contaminating water sources. Upon completion of the decommissioning 	Negligible	<p>Inspection of sewage system</p> <p>Perimeter drain oil trap Regular checking and cleaning of oil, fuel and waste spills</p> <p>Inspection of perimeter drain and road culverts</p>	<p>Drilling Contractor/ Camp Boss</p> <p>Drilling Contractor Drilling Contractor</p> <p>Operations Manager</p>	<p>Monthly</p> <p>Each Tour (12 hourly) Each Tour (12 hourly)</p> <p>Weekly</p>	<p>World Health Organisation (2011). WHO Guidelines for Drinking-water Quality, 2011</p> <p>International Best Practice:</p> <ul style="list-style-type: none"> Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) EHS General Guidelines (IFC 2007b)



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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
			<p>phase, disturbed areas will be contoured and vegetated to minimise the potential for soil erosion and water quality related impacts.</p> <ul style="list-style-type: none"> Temporary sediment and erosion control measures such as sediment fences installed where necessary especially in areas in close proximity to drains or surface water features to avoid runoff to water source. Any area artificially elevated via pad or access track construction will be lowered to original ground level by removal of paving material unless otherwise instructed by the landowners. Original drainage patterns will be restored. 					
8.	Groundwater All Phases	Minor	<ul style="list-style-type: none"> The freshwater aquifer at approximately 84m is cased off immediately after passing through before drilling continues Mud chemicals are non-toxic with the exception of biocide, but this is used in low quantities. 	Negligible	<p>Inspection of sewage system</p> <p>Perimeter drain oil trap</p> <p>Regular checking and cleaning of oil, fuel and waste spills</p> <p>Inspection of perimeter drain and road culverts</p>	<p>Drilling Contractor/ Camp Boss</p> <p>Drilling Contractor</p> <p>Drilling Contractor</p> <p>Operations Manager</p>	<p>Monthly</p> <p>Each Tour (12 hourly)</p> <p>Each Tour (12 hourly)</p> <p>Weekly</p>	<p>World Health Organisation (2011). WHO Guidelines for Drinking-water Quality, 2011</p> <p>International Best Practice:</p> <ul style="list-style-type: none"> Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) EHS General Guidelines (IFC 2007b)



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9.	Operational Leaks and Spills All Phases	Minor	<ul style="list-style-type: none"> Rig design incorporates leak minimisation and drainage containment systems to ensure that spillages do not enter the environment. All chemicals and fuel on site will be stored in bunded impermeable areas with adequate shading. Correct storage, handling, use and transportation of chemicals will be followed according to manufacturer's specifications, material safety data sheets and regulations. Provide a Hazardous Substance SOP for chemicals management in compliance with company rules and national standards. No disposal of unused chemicals, all excess materials will be quantified and recorded and returned to the vendors. Prepare spill contingency plans. 	Negligible	<p>OSCP</p> <p>Regular checking and cleaning of oil, fuel and waste spills</p> <p>Inspection of perimeter drain and road culverts</p> <p>OSCP drill</p>	<p>HSE Officer</p> <p>Drilling Contractor</p> <p>Operations Manager</p> <p>HSE Officer</p>	<p>Continuous</p> <p>Each Tour (12 hourly)</p> <p>Weekly</p> <p>Pre spud</p>	<p>TR Oil/Chemical Spill Contingency Plan (OSCP)</p> <p>International Best Practice:</p> <ul style="list-style-type: none"> IPIECA (2016). Oil spills: inland response good practice guidelines for incident management and emergency response personnel Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) EHS General Guidelines (IFC 2007b)
10.	Worst Case Oil Spill Operations	Major	<ul style="list-style-type: none"> Detailed well design aimed at prevention of any loss of control during drilling. Preventative measures and equipment integral in well design, including drilling fluids (mud) and blow-out preventer, well control procedures. See Project Safety Case. Prepare oil spill contingency plan. 	Moderate	<p>CMP / IMP</p> <p>ERP</p> <p>Maintenance of CMP/IMP</p>	<p>General Manager Exploration</p> <p>Drilling Contractor</p> <p>HSE Officer</p>	<p>Continuous</p> <p>Continuous</p> <p>Continuous</p>	<p>TR Crisis Management Plan (CMP) / Incident Management Plan (IMP)</p> <p>Emergency Response Plan (ERP)</p> <p>International Best Practice:</p> <ul style="list-style-type: none"> IPIECA (2015). Oil spills: inland response good



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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
					CMP/IMP/ ERP Drill	HSE Officer	Pre spud	practice guidelines for incident management and emergency response personnel No 514 2015. - IPIECA (2014). Incident Management System No 517 Nov 2014. - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
11.	Water Supply All Phases	Negligible	<ul style="list-style-type: none"> Procure adequate water for the operations with a high yield. Ensure no water use competition with the local community. 	Negligible	Monitor water usage Monthly water management report	Drilling Contractor Operations Manager	Daily Monthly	TR Grievance mechanism International Best Practice: IOGP (E&P Forum) and UNEP (1997). Environmental Management in Oil & Gas Exploration and Production 1997. IOGP Report No. 254



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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
12.	Biodiversity, flora, fauna and habitat All Phases	Negligible	<ul style="list-style-type: none">Education on the importance of flora and fauna in the areas, including the appropriate regulatory requirementsRapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the reestablishment of plant cover is desirable to prevent erosion if it was necessary.Implement a tree planting program to offset loss of trees due to the construction phaseClearing vegetation only in construction areas and demarcating areas where no clearing will happen.Vehicles coming into the site must use designated roads.Apply spill prevention practices and response actions in refuelling and vehicle-use areas to minimize accidental contamination of habitats.Address spills immediately per the appropriate spill management plan, and initiate soil clean-up and soil removal if needed.Turn off all unnecessary lighting at night to avoid disturbing wildlife and migratory birds.Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance.Schedule decommissioning activities to avoid disturbance of resources during critical periods, for example night, or year, for example breeding, nesting seasons.Rehabilitate all the areas of disturbed soil using	Negligible	Grievance/ Complaints records	Community Liaison Officer/HSE Officer	Continuous	TR Grievance mechanism IUCN (2020). <i>The IUCN Red List of Threatened Species. Version 2020-2.</i>



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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
			weed free native grasses and shrubs. • Undertake rehabilitation activities as early as possible on disturbed areas in consultation with the relevant authorities, e.g. Forestry Department.					
13.	Liquid Effluents All Phases	Minor	• Open drains on the rig floor will collect any oily residues and discharge to the mud pit. • Rainwater is routed via the perimeter drain to an interceptor where oil is separated. • Sewage will be collected and treated in a standard field septic system and the effluent discharged to the ground through a trickle feed weeping tile. • The drilling rig will have a test separator to process any produced fluid from well testing operations. Any produced liquids will be stored in tanks and transported to existing facilities for processing. • Compliance with Municipality on waste matters. • Employing a waste management plan.	Negligible	Inspection of sewage system Perimeter drain oil trap	Drilling Contractor/ Camp Boss Drilling Contractor	Monthly Each Tour (12 hourly)	TR Waste Management Plan TR Grievance mechanism International Best Practice: - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b) - IOGP (2009). Guidelines for waste management with special focus on areas with limited infrastructure Report No. 413, rev1.1 September 2008 (updated March 2009)

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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
14.	Solid Waste All Phases	Moderate	<ul style="list-style-type: none"> Work in concert with the Municipality to develop and implement a fit for purpose waste management plan. Assess and create opportunities for Reducing, Reusing, and Recycling of waste generated. Municipality making available suitable facilities for the collection, segregation, storage and safe disposal of the wastes. Create waste collection areas for segregation of waste with clearly marked facilities such as colour coded bins. The bins to be coded according to biodegradable and non-biodegradable, reuse, recycling and reduce. 	Minor	<p>Cuttings volumes recorded</p> <p>Rig wastes recorded, manifested and tracked</p> <p>Camp wastes recorded, manifested, tracked</p> <p>All wastes: Monthly Summary report</p>	<p>Drilling Contractor</p> <p>Drilling Contractor</p> <p>Camp Boss</p> <p>Operations Manager</p>	<p>Daily</p> <p>Daily</p> <p>Daily</p> <p>Monthly</p>	<p>TR Waste Management Plan</p> <p>TR Grievance mechanism</p> <p>International Best Practice:</p> <ul style="list-style-type: none"> Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) EHS General Guidelines (IFC 2007b) IOGP (2009). Guidelines for waste management with special focus on areas with limited infrastructure Report No. 413, rev1.1 September 2008 (updated March 2009)
15.	Noise Construction	Minor	<ul style="list-style-type: none"> Restrict construction activities to normal working hours 0800hrs to 1700hrs Inform local residents beforehand, via notices and advisories, of pending noisy periods and solicit their tolerance well before the commencement of demolition works. Machinery should be maintained regularly to 	Negligible	Noise monitoring at fence and sensitive receptors	Operations Manager	Monthly	<p>TR Noise Management Plan</p> <p>TR Grievance mechanism</p> <p>World Health Organisation (2015). WHO noise quality standard – WHO, 2015.</p>

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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
			reduce noise resulting from friction during operations. <ul style="list-style-type: none"> • Drivers to adhere to speed limits within the project site access roads and vicinity • A grievance procedure will be established whereby noise complaints by neighbours are recorded and responded to. • Restrict hooting of vehicular horns. • Locate all stationary construction equipment (i.e., compressors and generators) as far as practicable from any nearby sensitive receptors. • Shielding the area to reduce noise propagation at Raiketan as necessary. 					International Best Practice: <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
16.	Noise Operations	Moderate	<ul style="list-style-type: none"> • Machinery should be maintained regularly to reduce noise resulting from friction during operations. • A grievance procedure will be established whereby noise complaints by neighbours are recorded and responded to. • Muffle and maintain all construction equipment used. • Using modern machinery equipment with noise suppressing technologies in order to reduce the noise-rating as much as possible. 	Minor	Noise monitoring at fence and sensitive receptors	Operations Manager	Monthly	TR Noise Management Plan TR Grievance mechanism World Health Organisation (2015). WHO noise quality standard – WHO, 2015. International Best Practice: <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)



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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
17.	Noise Decommissioning	Minor	<ul style="list-style-type: none"> Restrict decommissioning activities to normal working hours 0800hrs to 1700hrs Inform local residents beforehand, via notices and advisories, of pending noisy periods and solicit their tolerance well before the commencement of demolition works. Machinery should be maintained regularly to reduce noise resulting from friction during operations. Drivers to adhere to speed limits within the project site access roads and vicinity A grievance procedure will be established whereby noise complaints by neighbours are recorded and responded to. Restrict hooting of vehicular horns. Locate all stationary construction equipment (i.e., compressors and generators) as far as practicable from any nearby sensitive receptors. Limit pick-up trucks and other small equipment to an idling time, observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible. Shielding the area to reduce noise propagation at Raiketan as necessary. 	Negligible	Noise monitoring at fence and sensitive receptors	Operations Manager	Monthly	<p>TR Noise Management Plan TR Grievance Mechanism</p> <p>World Health Organisation (2015). WHO noise quality standard – WHO, 2015.</p> <p>International Best Practice:</p> <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
18.	Light, Heat and Odours	Negligible	<ul style="list-style-type: none"> The site occupies a small area will be in place temporarily. Any important sensitivity in the project areas (e.g. infrastructures, areas of significant vegetation cover, sensitive cultivations, important sites for cultural heritage, etc.) will be identified and avoided as appropriate. 	Negligible	Grievance/ Complaints records	Community Affairs Officer	Continuous	<p>Grievance mechanism</p> <p>International Best Practice:</p> <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas

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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
			<ul style="list-style-type: none"> Use a lower level of lighting i.e. sufficient to enhance the night-time visibility required for safety and security Use specifically designed lighting equipment that minimises the upward spread of light near to and above the horizontal. Shading floodlights to only shine inside the site perimeter Turn off all unnecessary lighting at night to avoid disturbing wildlife and migratory birds. 					Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
19.	Community All Phases	Minor	<ul style="list-style-type: none"> Consultation with the Municipality and liaison with community during the planning phase. Establish a robust, open, two way Complaints/ Grievance Mechanism. Establishing emergency procedures and ensuring the community are aware and educated on following them and commensurate to the magnitude and type of risk. The work site(s) will be fenced off to protect the general public from dangers associated with the drilling operations, including security in and around the site to control the movement of people. Placing visible and readable warning signs around the work sites and access roads where there are exposures. Compliance with Timor Resource's local content policy that reflects the requirement to hire locally, including a transparent and accessible application and short-listing process of workers. 	Negligible	Grievance/ Complaints records Local Recruitment Program New recruit Training and Induction Local Community Education and Awareness Program	Community Affairs Officer Country Manager Community Affairs Officer Community Affairs Officer	Continuous Pre-project Continuous Continuous	Grievance mechanism National Labour Code and SEPFOPE Regulation International Best Practice: - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)



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No.	Impact	Impact Rating	Proposed Mitigation Measures	Residual Impact	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
			<ul style="list-style-type: none">Where possible, look into vocational training programs for the local workforce to promote development of skills required by the oil and gas industry.					
20.	Visual	Negligible	<ul style="list-style-type: none">The site occupies a small area and the drilling facilities will be in place temporarily.The project is limited spatially to the one-hectare drilling location and its immediate surrounds and is short term and transient in nature.Any important sensitivity in the project areas (e.g. infrastructure, areas of significant vegetation cover, sensitive cultivations, important sites for cultural heritage, etc.) will be identified and avoided as appropriate.	Negligible	Grievance/ Complaints records	Community Affairs Officer	Continuous	Grievance mechanism

Table 19 - Summary of Monitoring Activities

No.	Monitoring	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
1.	Land Use All Phases	Grievance/ Complaints records	Community Affairs Officer	Continuous	TR Grievance mechanism International Best Practice: IOGP (E&P Forum) and UNEP (1997). Environmental Management in Oil & Gas Exploration and Production 1997. IOGP Report No. 254
2.	Traffic All Phases	Adherence to Traffic Management Procedure Journey Management Speed Monitoring Engine and generator service records Driver training Defensive driving	Operations Manager	Daily Daily Daily Monthly Induction	TR Traffic Management Plan Grievance mechanism International Best practice: IOGP Land Transportation Safety Recommended Practice 365 November 2016 Issue relevant Reports and Standard Operating Procedures Accident and Incident Reports
3.	Soil All Phases	Regular Inspection of road culverts and rig drainage system Adherence to Site Civils Construction Procedure	Operations Manager Civils Construction Engineer	Weekly Monthly	International Best Practice: - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a)
4.	Air Quality Construction	Dust management Particulates Monitoring Fuel Consumption Engine and generator service	Civils contractor for construction Civils Contractor for construction Transport Contractor for service vehicles Transport Contractor	Daily Monthly Daily Monthly	TR Air Quality Management Plan World Health Organisation (2005). WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide. Global update 2005 - Summary of Risk Assessment. World Health Organisation (2018). WHO Fact Sheet Ambient (outdoor) air pollution. 2 May 2018. International Best Practice:

No.	Monitoring	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
		records			<ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b) - IFC Performance Standard 1 (PS 1) - Assessment and Management of Environmental and Social Risks (IFC 2012).
5.	Air Quality Operations	Dust management Generator fuel consumption Particulates Monitoring Fuel Consumption Engine and generator service records	Drilling contractor Drilling Contractor for rig emissions/ Transport contractor for service vehicles Transport Contractor Drilling contractor	Daily Daily Monthly Daily Monthly	TR Air Quality Management Plan World Health Organisation (2005). WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide. Global update 2005 - Summary of Risk Assessment. World Health Organisation (2018). WHO Fact Sheet Ambient (outdoor) air pollution International Best Practice: <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b) - IFC Performance Standard 1 (PS 1) - Assessment and Management of Environmental and Social Risks (IFC 2012).
6.	Air Quality Decommissioning	Dust management Particulates Monitoring Engine and generator service records	Civils contractor Civils contractor Transport contractor for service vehicles	Daily Monthly Monthly	TR Air Quality Management Plan World Health Organisation (2005). WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide. Global update 2005 - Summary of Risk Assessment. World Health Organisation (2018). WHO Fact Sheet Ambient (outdoor) air pollution International Best Practice: <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b) - IFC Performance Standard 1 (PS 1) - Assessment and Management of Environmental and Social Risks (IFC 2012).

No.	Monitoring	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
7.	Surface Water All Phases	Inspection of sewage system Perimeter Drain Oil Trap Regular checking and cleaning of oil, fuel and waste spills Inspection of perimeter drain and road culverts	Drilling Contractor/ Camp Boss Drilling Contractor Drilling Contractor Operations Manager	Monthly Each Tour (12 hourly) Each Tour (12 hourly) Weekly	World Health Organisation (2011). WHO Guidelines for Drinking-water Quality, 2011 International Best Practice: - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
8.	Groundwater All Phases	Inspection of sewage system Perimeter drain oil trap Regular checking and cleaning of oil, fuel and waste spills Inspection of perimeter drain and road culverts	Drilling Contractor/ Camp Boss Drilling Contractor Drilling Contractor Operations Manager	Monthly Each Tour (12 hourly) Each Tour (12 hourly) Weekly	World Health Organisation (2011). WHO Guidelines for Drinking-water Quality, 2011 International Best Practice: - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
9.	Operational Leaks and Spills All Phases	OSCP Regular checking and cleaning of oil, fuel and waste spills Inspection of perimeter drain and road culverts OSCP drill	HSE Officer Drilling Contractor Operations Manager HSE Officer	Continuous Each Tour (12 hourly) Weekly Pre spud	TR Oil/Chemical Spill Contingency Plan (OSCP) International Best Practice: - IPIECA (2016). Oil spills: inland response good practice guidelines for incident management and emergency response personnel - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
10.	Worst Case Oil	CMP / IMP	General Manager	Continuous	TR Crisis Management Plan (CMP) /

No.	Monitoring	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
	Spill Operations	SERP Maintenance of CMP/IMP CMP/IMP/ SERP Drill	Exploration Drilling Contractor HSE Officer HSE Officer	Continuous Continuous Pre spud	Incident Management Plan (IMP) Site Emergency Response Plan (SERP) International Best Practice: <ul style="list-style-type: none"> - IPIECA (2015). Oil spills: inland response good practice guidelines for incident management and emergency response personnel No 514 2015. - IPIECA (2014). Incident Management System No 517 Nov 2014. - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
11.	Water Supply All Phases	Monitor water usage Monthly water management report	Drilling Contractor Operations Manager	Daily Monthly	TR Grievance mechanism International Best Practice: IOGP (E&P Forum) and UNEP (1997). Environmental Management in Oil & Gas Exploration and Production 1997. IOGP Report No. 254
12.	Biodiversity, flora, fauna and habitat All Phases	Grievance/ Complaints records	Community Liaison Officer/HSE Officer	Continuous	TR Grievance mechanism IUCN (2020). <i>The IUCN Red List of Threatened Species. Version 2020-2.</i>
13.	Liquid Effluents All Phases	Inspection of sewage system Perimeter drain oil trap	Drilling Contractor/ Camp Boss Drilling Contractor	Monthly Each Tour (12 hourly)	TR Waste Management Plan TR Grievance mechanism International Best Practice: <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b) - IOGP (2009). Guidelines for waste management with special focus on areas with limited infrastructure Report No. 413, rev1.1 September 2008 (updated March 2009)
14.	Solid Waste All Phases	Cuttings volumes recorded Rig wastes recorded, manifested and tracked Camp wastes recorded,	Drilling Contractor Drilling Contractor	Daily Daily Daily	TR Waste Management Plan TR Grievance mechanism International Best Practice: <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b) - IOGP (2009). Guidelines for waste management with special focus on

No.	Monitoring	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
		manifested, tracked All wastes: Monthly Summary report	Camp Boss Operations Manager	Monthly	areas with limited infrastructure Report No. 413, rev1.1 September 2008 (updated March 2009)
15.	Noise Construction	Noise monitoring at fence and sensitive receptors	Operations Manager	Monthly	TR Noise Management Plan TR Grievance mechanism World Health Organisation (2015). WHO noise quality standard – WHO, 2015. International Best Practice: - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
16.	Noise Operations	Noise monitoring at fence and sensitive receptors	Operations Manager	Monthly	TR Noise Management Plan TR Grievance mechanism World Health Organisation (2015). WHO noise quality standard – WHO, 2015. International Best Practice: - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
17.	Noise Decommissioni ng	Noise monitoring at fence and sensitive receptors	Operations Manager	Monthly	TR Noise Management Plan TR Grievance Mechanism World Health Organisation (2015). WHO noise quality standard – WHO, 2015. International Best Practice: - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
18.	Light All Phases	Grievance/ Complaints records	Community Affairs Officer	Continuous	Grievance mechanism International Best Practice: - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)

No.	Monitoring	Monitoring/ Performance Indicator	Responsible Person / Function	Timing and Frequency	Performance Standard
19.	Odours All Phases	Grievance/ Complaints records	Community Affairs Officer	Continuous	Grievance mechanism International Best Practice: <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)
20.	Community All Phases	Grievance/ Complaints records Local Recruitment Program New recruit Training and Induction Local Community Education and Awareness Program	Community Affairs Officer Country Manager Community Affairs Officer Community Affairs Officer	Continuous Pre-project Continuous Continuous	Grievance mechanism National Labour Code and SEPFOPE Regulation International Best Practice: <ul style="list-style-type: none"> - Environmental Health and Safety (EHS) Guidelines for Onshore Oil and Gas Development (IFC 2007a) - EHS General Guidelines (IFC 2007b)

11 REPORTING REQUIREMENTS

Routine reports and records are used to record performance against the EMP requirements and to demonstrate that legal requirements such as the Environmental Basic Law No 26/2012 and Environmental Licensing Decree Law 5/2011 are met, as well as meeting TR policy and OMS expectations. Reports are presented as daily/weekly operational reports and in monthly/quarterly/annual performance formats, as described below.

Daily operational reports are prepared for routine drilling and project activities and include a brief summary of any HSE and/or community issues during the previous 24 hour period.

Weekly operational reports are provided to management including any HSE/community incidents. Weekly operational reports are required under Law 18/2020.

Monthly, Quarterly and Annual performance reports prepared for the Chief Executive Officer are a compilation of the weekly operations report and include the performance metrics shown in Table 20. Similar Community Affairs reports are prepared by the Community Affairs Officer. An annual report is required under Law 18/2020 as per Article 23 which is to include a summary of HSE performance through the year.

Incident reports are required following any incident or near miss and are specified under the TR OMS and Law 18/2020 Article 125.

Environmental Reporting under Law 5/2011 includes biannual inspection reports during the construction and decommissioning phases and an annually during the operational phase. Environmental Provisions are also specified in Decree Law 18/2020, Chapter XVII, in particular Article 144 - Environmental Management Plan, Article 145 - Environmental Monitoring and Article 147 - Environmental Performance Report.

The EMP monitoring and performance requirements are detailed in Table 19, and the reports generated by this activity are summarised in Table 21 and will be prepared and submitted in accordance with the project environmental license reporting requirements typically:

Table 20 - Quarterly/Annual HSE Reporting (Lagging and Leading Indicators)

LAGGING INDICATORS	Target Per well	Well 1	Well 2	Well 3	Well 4	Well 5
CO ₂ Emissions (tonnes per well)	200 tonnes					
Oil and Chemical Spills (Number of spills > 15 bbls)	Zero					
Oil and Chemical Spills – Total Spilt (tonnes)	Zero					
Oil and Chemical Spills – released to the environment (tonnes)	Zero					
LEADING INDICATORS						
Extent of compliance with EIA mitigation measures (per Quarter - percentage) The extent to which mitigation measures identified in the EIA have been set and achieved. Expressed as a percentage: Total number of mitigation measures satisfactorily completed x 100 Total number of mitigation measures identified	60%					
Recycled waste (per well - tonnes) Segregated waste for recycling - plastic bottles and tin cans. Expressed as a weight tonnes.	2 tonnes					
Complaints made and redress agreed (per well - percentage) Ratio of complaints received vs number redressed Total number complaints redressed x 100 Total number of complaints made	80%					
Employment Number of local people working in the campaign (rig and camp)	76					
Environmental Inspections and Audits Conducted (per well) Area inspections are primarily operational (e.g. weekly rig and camp inspections), and also weekly inspections for Logistics operations (e.g. road transport/Journey Management System).	5					
Regular inspection and maintenance of road culverts and rig drainage system The extent to which inspections are have been set in the EMP and the number achieved. Expressed as a percentage: Total number of inspections completed x 100 Total number of inspections required	80%					
Regular maintenance or service of vehicles, equipment and/or machinery The extent to which vehicle/plant/equipment servicing is set in the EMP and the number achieved. Expressed as a percentage: Total number of services completed x 100 Total number of services required	80%					

Table 21 - Project report type and distribution list

Monitoring/ Performance Activity	Report	Timing and Frequency	Distribution	Responsible Person / Function
Local Recruitment Program - as required under the National Labour Code/SEPFOPE	Personnel records	Pre-project	External - ANPM	Country Manager
New recruit Training and Induction	Community Affairs reports	Continuous	Internal	Community Affairs Officer
Local Community Education and Awareness Program		Continuous	Internal External - ANPM	Community Affairs Officer
Drills: CMP/IMP/ SERP/OSCP	Exercise/Drill Reports	Pre spud	Internal	HSE Officer
Implementation: CMP/IMP				General Manager Exploration
SERP				Drilling Contractor
OSCP				HSE Officer
Driver training Defensive driving	Personnel records	Induction	Internal	Operations Manager
Grievance/ Complaints records	Grievance Report Forms	Continuous	Internal External - ANPM	Community Affairs Officer
DAILY				
Perimeter drain oil trap inspection Each Tour (12 hourly)	Non-conformance report as required	As required	Internal	Drilling Contractor
Regular checking and cleaning of oil, fuel and waste spills Each Tour (12 hourly)	Non-conformance report as required	As required	Internal	Drilling Contractor
Daily - Adherence to Traffic Management Procedure	Non-conformance report as required	As required	Internal	Operations Manager
Journey Management	Journey Management Sheets	Daily	Internal	Operations Manager
Speed Monitoring - Daily	Non-conformance report as required	As required	Internal	Operations Manager
Dust management - Daily	Visual		Internal	Civils contractor for construction Drilling Contractor for rig operations
Fuel Consumption	Operations Report	Daily/Weekly/Monthly	Internal	Transport Contractor for service vehicles
	Performance Reports	Quarterly and Annual	Internal	Drilling Contractor for rig operations
	Inspection Reports (under Law 5/2011)	Biannual and annual	External - ANPM	


Monitoring/ Performance Activity	Report	Timing and Frequency	Distribution	Responsible Person / Function
Monitor water usage	Operations Report	Daily/Weekly/Monthly	Internal	Drilling Contractor
	Performance Reports	Quarterly and Annual	Internal	
	Inspection Reports (under Law 5/2011)	Biannual and Annual	External - ANPM	
Cuttings volumes recorded	Operations Report	Daily/Weekly/Monthly	Internal	Drilling Contractor
	Performance Reports	Quarterly and Annual	Internal	
	Inspection Reports (under Law 5/2011)	Biannual and Annual	External - ANPM	
Rig wastes recorded, manifested and tracked	Operations Report	Daily/Weekly/Monthly	Internal	Drilling Contractor
	Performance Reports	Quarterly and Annual	Internal	
	Inspection Reports (under Law 5/2011)	Biannual and Annual	External - ANPM	
Camp wastes recorded, manifested, tracked	Operations Report	Daily/Weekly/Monthly	Internal	Camp Boss
	Performance Reports	Quarterly and Annual	Internal	
	Inspection Reports (under Law 5/2011)	Biannual and Annual	External - ANPM	
WEEKLY				
Weekly Inspection of road culverts and rig drainage system	Non-conformance report as required	As required	Internal	Operations Manager
MONTHLY				
Engine and generator service records	Operations Report	Daily/Weekly/Monthly	Internal	Transport Contractor
	Performance Reports	Quarterly and Annual		
Adherence to Site Civils Construction Procedure	Operations Report	Daily/Weekly/Monthly	Internal	Civils Construction Engineer
	Performance Reports	Quarterly and Annual		
Particulates Monitoring	Operations Report	Monthly	Internal	Civils Contractor during construction
	Performance Reports	Quarterly and Annual	Internal	Operations Manager during operations and decommissioning
	Inspection Reports (under Law 5/2011)	Biannual and Annual	External - ANPM	
Monthly inspection of sewage system	Non-conformance report	As required	Internal	Drilling Contractor/ Camp Boss
Monthly water management report	Operations Report	Monthly	Internal	Operations Manager
	Performance Reports	Quarterly and Annual	Internal	
	Inspection Reports (under Law 5/2011)	Biannual and Annual	External - ANPM	



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Monitoring/ Performance Activity	Report	Timing and Frequency	Distribution	Responsible Person / Function
All wastes: Monthly Summary report	Operations Report	Monthly	Internal	Operations Manager
	Performance Reports	Quarterly and Annual	Internal	
	Inspection Reports (under Law 5/2011)	Biannual and Annual	External - ANPM	
Noise monitoring at fence and sensitive receptors	Operations Report	Monthly	Internal	Operations Manager
	Performance Reports	Quarterly and Annual	Internal	
	Inspection Reports (under Law 5/2011)	Biannual and Annual	External - ANPM	

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12 RESPONSIBILITIES FOR MITIGATION AND MONITORING ACTIVITIES

Responsibilities are presented in Table 18, Table 19 and Table 21.

13 EMERGENCY PLAN

The Emergency response system in place for the project is presented in the project Safety Case Bridging Document and is include below.

13.1 EMERGENCY RESPONSE PROCEDURES

Planning for the drilling program crisis and emergency response in PSC TL OT 17 08 falls under three main categories:

- Incidents concerning Eastern Drilling (ED) Rig #1 rig site will be managed by the ED Emergency Response Team (ERT). Timor Resources Incident Management Team (IMT) and, as required, Crisis Management Team (CMT) will support and work in co-operation with ED ERT.
- Incidents off the rig site concerning Timor resource's operations, activities, personnel, families, office, vehicles, camp and expatriate accommodation. In such cases the Timor Resources in country Incident Management Team (IMT) will directly manage the incident, in liaison with ED and ANPM as necessary.
- Incidents that may affect Timor Resource's reputation and cooperation with Government and ANPM , its capability and capacity of doing business, business continuity and recovery, and direct stakeholder involvement or interest. The incident will be coordinated under the TR Crisis Management Team (CMT) may or may not be related to operational activities.

Both TR and ED have an Emergency/Incident Management Team that operate within the following guidelines:

- Timor Resources: Site Emergency Response Plan TR-PLN- 003
- Eastern Drilling Site: Emergency Response Procedure ED-HSE-SOP-05.

The purpose of these documents is to provide written guidance for the actions to be taken by personnel during an emergency. ED has primacy in any emergency situation that endangers the safety of personnel or the integrity of the rig. TR has primacy in a pollution incident and an incident off the rig.

The ED Rig Superintendent has primacy in any emergency situation involving rig personnel or equipment. The ED Rig Superintendent is the designated On-Scene Commander (OSC) during any emergency situation on RIG #1 and is responsible for directing the response to the emergency in accordance with the ED Emergency Response Procedure ED-HSE-SOP-05.

The TR Drilling Supervisor provides support and advice to the OSC during the emergency situation. He has overall responsibility for communicating with the TR General Manager Exploration and TR Dili Incident Management Team (IMT) lead by Director Commercial and Compliance. The TR Drilling Supervisor will also coordinate clean-up operations in case of oil or fuel spillage.

Muster lists are kept in the RIG #1's Rig Superintendent's office which serves as the Emergency Control Centre (ECC). These POB lists are updated daily and are maintained by the Rig HSE Officer and communicated daily in the daily HSE report to Dili.

The ED Rig Superintendent is responsible for organising Emergency Drills at frequent intervals, as per the RIG #1 HSE Safety Plan.

Table 22 - ED Rig #1 Emergency Drills

TYPE OF DRILL	FREQUENCY	PERSONNEL
Any Scenario	Pre-spud	All
BOP	14 days (not to exceed 21 days)	Drilling Crew
Pit Drill	14 days	Drilling Crew
Kick/Trip Drill	Daily	Drilling Crew
Fire / Abandon	Weekly	All
Fire / Mock injury	Monthly	All
Emergency Response plan	6 Month	Rig + Base + Dili
Medical Evacuation	6 Month	ISOS
Search & Rescue	Monthly	All

13.2 MEDICAL ORGANISATION

ED will maintain a clinic on the rig site and a trauma trained medic will be on site at all times. The medical arrangements for ED Rig #1 is provided in *ED-HSE-SOP-21 Site Medical Treatment & Facility Standard*.

13.3 MEDEVAC ARRANGEMENTS

TR have in place a contract with Mission Aviation Fellowship (MAF) for the chartering of an aircraft to execute medevac of injured persons (IP) from the field using Suai airport. The rig medic will accompany an IP to Dili where transfer to a local medical provider or, if necessary, direct onward movement by air ambulance to Darwin or Denpasar. Full details of the medevac arrangements for field operations are included in TR *Site Emergency Response Plan TR-PLN-003*.

13.4 EMERGENCY COMMUNICATIONS

TR are solely responsible for all communications with ANPM. ED will refer any matters requiring ANPM involvement to TR Director Communications and Compliance.

PNTL

TR will provide ANPM and the appropriate law enforcement agencies with a verified POB list. The TR IMT will cross check this with TR POB list before it is released.

In the event of any fatalities, TR will inform ANPM and the PNTL as soon as possible of the names of the deceased. The PNTL will then notify the next-of-kin, accompanied, if possible, by a representative from TR/ED if the deceased is a TR/ED employee.

Media

TR will coordinate with ANPM during any incident. TR will support ANPM in liaising with government departments and handling any local media.


In the event of an emergency, early contact will be established between TR and ANPM Media Response Teams. TR will issue a Holding Statement at the earliest opportunity, to the designated government organisation. All subsequent communications with the media will originate from the TR IMT and will be reviewed in a timely manner and approved by ANPM and ED prior to any release.

Relatives

TR will handle enquiries from relatives of TR personnel and TR contracted employees. Relatives of ED employees and contractors will be handled by the ED HR team. (All efforts will be made to issue consistent statements).

13.5 OIL SPILL RESPONSE

TR will organize the mobilisation of people and equipment in accordance with the TR Oil Spill Contingency Plan. The TR Drilling Supervisor is responsible for oil spill response and will keep the ED Rig Superintendent apprised of the oil spill response situation. TR IMT will prepare and send the appropriate government notification with a copy to the ED Manager and to the TR Drilling Supervisor.

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14 DECOMMISSIONING PLAN (P&A)

Timor Resource will restore the project locations as part of its project remediation plan (see Appendix B: Rehabilitation Plan).

15 CAPACITY BUILDING AND TRAINING

15.1 CAPACITY BUILDING


The following methods are used to ensure that personnel have the necessary knowledge, skills and abilities to meet their responsibilities and to perform their jobs safely, effectively and with due regard for the environment and communities.

- Each manager or supervisor ensures that the knowledge and skills of personnel are appropriate to their work environment. This includes the induction/ orientation procedure, regular awareness training and the provision of relevant information to ensure that personnel are aware of their HSE Obligations.
- Establishing competencies both general and specific (e.g. well control, fire team leader, etc.) required to meet the responsibilities for each job function.
- Assessing individual competencies against the defined responsibilities for the job.
- All newly hired employees are provided with an HSE orientation on the first day and are made aware of any inherent hazards associated with their job.
- Any employee transferred to a new job duty receives the same training as a new hire.

15.2 TRAINING

A training needs assessment is an essential part of the local hire training program and will identify the training needs for each new hire/local hire job in relation to critical exposures. This is primarily a site activity that is conducted by Line Managers/Superintendents and Supervisors. The following routine training is conducted:

- Induction Training, a general orientation to all new employees.
- Specific training on how to do assigned tasks includes training on grinding, cutting and welding, handling tools, spill management and defensive driving.
- Safety training on lifting and rigging equipment.
- Training in hazardous materials handling and specialist machinery/equipment operation.
- First aid, fire-fighting and emergency response, MSDS, PPE, etc.
- Personnel certification, training and examination on NDT, Heavy Equipment (Forklift, Crane, Lifting Boom), Welding, etc.

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16 PUBLIC CONSULTATION AND DISSEMINATION OF INFORMATION

16.1 PURPOSE OF THE CONSULTATION DURING THE PREPARATION OF EIS

Public Consultation for proposed drilling activity of Timor Resource in Suai is key, not only as part of the normal standard for obtaining the environmental licence, but also to gather input, opinions and ideas from communities affected by the proposed activity whilst at the same time serving as a means of disseminating technical and non-technical information. Timor Resources, facilitated by Safety Management Consultancy (SMC) presented information to the communities such as location of the drilling sites (Five drilling sites in total), the well depth, equipment use, infrastructure involved, legal basis, local content, and the potential effect of activity on communities and the surrounding environment.

In addition to dissemination of drilling information, the consultation was used to identify community or individual land and housing which might be directly or indirectly affected by the activities.

16.2 METHODOLOGY AND APPROACH

Consultation was carried out through individual approach, small group discussion and public consultation. Affected individuals or families were directly approached in the case of land use or farmland use as drilling sites. Small group gatherings were also carried out with local elderly to discuss on the cultural ceremony requirements and, with local authorities, to disseminate information and discussion on public consultation.

The Public Consultations were conducted by means of direct meeting between the project owner and general public, local institutions and other interest parties. The facilitator and the project owner directly presenting the material to the participants with a specific section dedicated to question and answer.

Before starting the consultation, the facilitator engaged directly with the participant to provide information on the structure of the public consultation itself. Apart from direct engagement the invitation was also formally issued to the participant.

The Public Consultation was carried out on separate gathering for each drilling location. Nearest villages or sucros to drill sites were invited to attend one day presentation, however, public notices were also sent out to invite any interested parties or individual to attend.

16.3 SUMMARY OF CONSULTATION ACTIVITIES

Below is a summary of consultation activities which were carried out in different stages:

Early Engagement

Prior to the finalization of well site determination through seismic evaluation, TR establish communication with local elderly people and local authority to disseminate information that TR has a confirmed plan to carry out drilling activities. Through these engagements, TR seek the support of local authorities to identify land ownership of well site area and possible access road. TR eventually secure a deal with farm land owner which used for Karau well site. Land entitlements for other four well sites are belonging to the government. National and Municipal land and Property department were also engaged to confirm the well site land entitlement.

Period of data collection and drafting of EIS

During data collection, TR through its consultant (SMC) directly approached Local authorities of Camenasa, Belekasak, Labarai, Matai, Tashilin, Administrador Municipio and Administrador do Posto that a team of engineers will visit potential well sites and community areas to collect environmental data. The team may also access bush land and farm areas for collection of ecological data and carried out transect survey for Flora and Fauna. They were also informed on coming public consultation and formal invitation to be delivered once the date and venue are confirmed.

Local institution such as Suai hospital and Clinics were also visited to collect health statistics and to discuss hospitals condition or readiness to respond to any emergency during the drilling.

Traditional elders from 5 Sucos were also met to discuss the traditional ceremonies prior to drilling and also to identify any landmark sacred sites which may need to be protected or aware of access restriction.

Actual Public Consultation

When the public gathering dates were determined, local authorities from 5 Sucos were approached again to secure Community Halls as the consultation venue. Formal invitations were dispatched to local authorities, local institution, NGOs and other interest parties. Village chiefs were requested to assist by disseminating the invitation verbally to general public, village elders and youth groups. A formal public announcement was also made through media and notice boards at Sucos and TR Suai office.

Community members were really enthusiastic to attend the presentation. This is shown by wide range of participants such as parents, elderly people, youth, students, member of public institutions, local authorities and Police.

16.4 SUMMARY OF MAIN COMMENTS FROM PARTICIPANTS

The following questions were raised by participants during the public consultation at the five well locations:

Local participation

The preoccupation of the locals were focusing on how their participation in terms of workforce and direct contribution such as providing goods and services to the project owner. Timor Resource advised that preference will be given to locals on merit base and as per requirement. However, the readiness of locals to participate is the key. TR will provide the means to enhance local participation for example providing training to workforce and if available with preferable standards, goods and service which will be acquired from locals.

Cultural and traditional respect and ceremonies

Before, during and after the drilling activities, respecting the cultural and traditional sites and ceremonies has to be prioritized by the project owner. Indeed there are some traditional ceremonies has been taken place during the initial engagement and TR pledges its promise to pay respect always the culture and traditions of the surrounding drilling sites. Local elders advised that traditional ceremony prior to spud on each well is a compulsory to follow local custom.

Avoiding damaging the environment

It is hoped that the project owner will pay much attention to the environment specially the flora and fauna. Livestock and their feeding ground has to be preserved. Locals also requested for TR to ensure no contamination of underground fresh water table. Experience from other companies on oil well blow outs were also raised by local leaders.

Compensation to land and other valuable Trees

Compensation for the community's land has become one of the central issues raises during the Public Consultation. Project owner pledges to pay attention to it and work hand in hand with the related authority to identify and taking care of the issue properly.

Providing infrastructure to communities

Providing clean water, road accesses, schools, gathering places for communities, sports facilities have also been asked to the project owner. The pledges has been given to communities by the project owner that as much as they can, the project owner will in coordination with other related government institution as well as communities leader to realize their queries.

16.5 COMMENTS TAKEN FOR CONSIDERATIONS

Timor Resources are well aware that having a good relationship with the public is key for the success of the drilling campaign. All issues, concerns and comments both technical and non-technical were noted and responded to accordingly during the public consultations. Below is a summary of the main issues which TR has taken into consideration:

Local participation

TR agreed to employ local people where possible in appropriate positions based on individual knowledge and capabilities. These jobs include; drivers, cleaners, security, kitchen hand and logistical assistance. Due to the short nature of the project period, technical recruitments for young graduates may not be available however this could be assessed when need arise. Local supply will also be considered however certain requirements may need to be fulfilled especially on food and beverage supply. It is paramount that supply is continues and hygiene to be maintained at all phases of preparation to prevent disruption and illnesses. Heavy equipment (trucks and road construction equipment) may also be sourced from local provided that equipment meets criteria.

Cultural ceremony and cultural sites

Requirement of traditional elders to carry out cultural ceremony prior to each spud and after drilling was also agreed. This is to follow the custom of one ceremony to open up the activity and one ceremony to close the activity. TR shall provide main material needed for each ceremony which may include a pig or a goat and other materials. TR is also committed to respect local cultural sites and will make every possible means to avoid disruption. Should there be a need to move a cultural site, local elders to be consulted and relocation to be made appropriately by following ceremonial requirements.

Avoid damaging to the environment

Well drilling will strictly follow standard and guideline describe under Well Application. Each well application contains various measures to ensure well integrity is maintained during and after the drilling to avoid blow outs. This include set appropriate casing to an appropriate depth to isolate underground fresh water table from drilling fluid. As for land damage, TR is committed to replant the well site area to its previous state if well site to be fully released. Similar treatment to be applied for access road however this access road could be left as it is if community requested to use the road.

Land Compensation

If a well site is designated at private land, TR will identify and discuss privately with the owner. All negotiation and compensation shall follow land and compensation law set by government until an agreement is reached. In case of discovery, a small size of area around well site will be secured for production activities. TR will engage land owner to negotiate whether to purchase or rent the well site area.

16.6 DETAILS OF ACTIVITIES AND PARTICIPANTS

The participants include Local Community leaders such as Chefe Suco, Chefe Aldeia and Local Youth Groups. There were also Representative of Local Authorities such as District Administrator, Sub District Administrator and Vice Commander of Police.

TR carried out individual or small group engagement through direct contact and face to face meetings. For large gathering, TR together with its consultant (SMC) carried out public consultation which accommodated all level of community and institutions.

Below was the sequence of Public Consultation:

- Opening remarks by of Administrador do Posto
- Presentation by TR country manager to introduce the company and drilling activities
- Presentation of SMC on technical activities, data collection and potential impacts (positive and negative impacts)
- Question and Answers
- Closing remarks by Police representative, Chefe Suco and Administrador do Posto.

Following are the detail schedule and participants:

1. Date: Monday, 21 October 2019, Location: Camenasa Community Hall
Attendance: ANPM - HSE team, TR team, Local community leaders of Camenasa: Chefe Suco, Chefe Aldeia, Oficiais Policia Comunitaria (OPS) and Cultural leaders of Holbelis; Local Authorities: Representatives of Municipio Administração Estatal (MAE), Segundo Commandante PNTL, other members of PNTL.
 Total Participants: 97 participants
 Consultation Commenced at 9:00 am to 12:30 pm
2. Date: Tuesday 22 October 2019 Location: Belecasac Community Hall
Attendance: SMC team, Local Community leaders of Belecasac-Chefe de Suco and Chefe villages Representative of Local Authorities- Representative of the District Administrator Sub District Administrator of Maucatar, Representative of Local Youth Group, Vice Command of Police, Local Community – Total 89 participants
 Consultation Commenced at 9:00 am to 12:30 pm
3. Date: Wednesday, 23 October 2019 Location: Matai Community Hall
Attendance: ANPM – HSE team and 9 other members, TR team, SMC team, Local Community leaders of Matai-Chefe de Suco and Chefe villages Traditional leaders. Representative of the Local Authorities- Agriculture, Environment Representative of the District Administrator, Sub District Administrator of Maucatar, Representative of Local Youth Group
 Local Police Commander, Local Community – Total 135 participants
 Consultation Commenced at 9:00 am to 12:30 pm

4. Date: Thursday, 24 October 2019 Location: Labarai Community Hall
Attendance: ANPM – HSE team and 9 other members, TR team, SMC team. Local Community leaders of Labarai: Chefe de Suco and Chefe villages Traditional Leaders. Representative of the Local Authorities- Agriculture Representative of the District Administrator, Sub District Administrator of Suai, Representative of Local Youth Group Local Veterans, Local Police Commander, Local Community – Total 132 participants Consultation Commenced at 9:00 am to 12:30 pm

5. Date: Friday 25 October 2019 Location: Community Hall of Tashilin
Attendance: Representative of the Local Authorities - The District Administrator, Sub District Administrator of Suai, Representative of Local Youth Group. Local Veterans, Local Police Commander, OPS and Local Community – Total 89 participants. Consultation Commenced at 9:00 am to 12:30 pm

16.7 SUMMARY OF PUBLIC OPINION AND ACCEPTANCE OF PUBLIC

During the public consultations and direct engagement, the public demonstrated great interest with the expectation that drilling could bring new opportunities for employment and business activities. Community and local authorities confirmed their support for the success of the project, however, advising TR to ensure that all activities are carried out with due diligence and based on applicable laws to minimize negative impacts in all phases of activities. Local authorities demonstrated their support by advising the public that this project is a national interest therefore requires cooperation from all levels of the community.

16.8 DESCRIPTION OF RELEVANT ACTIVITIES AND MATERIALS FOR CONSULTATIONS

Below are the activities carried out in preparation for consultation:

- Direct Contact was made to individuals and group informing certain activities and upcoming public consultation.
- Formal invitation letters were also distributed to local authorities, public institutions, Police and other interest parties.
- Information Dissemination through Media
- Information on the draft of EIA including the Public Notice was posted through national newspapers such as Timor Post and STTL and a hard copy of these documents were disseminated to Ministry for Mineral and Petroleum in Covalima as well as Post Administratives and affected sucos. As per the requirement under DM 47/2017. Identified/affected parties were given opportunities no less than 10 working days to provide feedback and comments on the draft EIA and submitted to proponent or the Environmental Authority

16.9 RECOMMENDATION FOR FUTURE CONSULTATIONS

Overall, the Public Consultation was successful in terms of participation and enthusiasm of communities. All preoccupation of communities have been addressed properly by the project owner. However, strong coordination between the project owner, communities and related government institution is advised.

16.10 PUBLIC CONSULTATION AFTER DRAFT EIA/EMP SUBMISSION TO ANPM

Timor Resources carried out one day Public Consultation in Suai Municipality on 21st of February 2020. It was mostly attended by local authorities, community leaders, community representative and other interest parties. The objective of this consultation was to disseminate information on the result of baseline study, current environmental condition, social impacts, further update on drilling preparation and also to obtain further public queries.

After the submission of draft EIA/EMP to ANPM, Timor Resources made a public notification through printed media and websites on this Public Consultation and also delivered direct invitations to local authorities, community leaders and interest parties. The open invitation is to invite any community members who may be interested or may be affected by this drilling activity to attend and carry forward any concern to the attention of Timor Resources and relevant authorities. The Public Notice was also to invite community members or any interest parties to obtain a copy of draft EIA/EMP for their review and comment.

Most of the concerns or questions from the participants are on the drilling impacts to communities, land and farms, mitigation on drilling issues environmental impacts, job opportunities and local supplies.

17 GRIEVANCE REDRESS MECHANISMS

The TR Grievance Redress Mechanism (GRM) (see Appendix C) is a requirement under the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP). TR is committed to implementing appropriate controls to avoid, manage, mitigate and remediate any negative impacts whilst maximising positive impacts. TR will establish positive, co-operative relationships with relevant government agencies and surrounding communities with the aim of ensuring key stakeholders are informed of TR performance.

The objectives of the GRM are to:

- Help TR understand the community's or stakeholder groups' perception of the environmental and social risks and impacts of the project.
- Ensure that formal grievances from the communities or others are promptly heard, analysed, handled and answered in order to take preventative actions and detect causes before they can have significant implications on business performance.
- Have a transparent and fair process for affected communities and other stakeholder groups seeking to have their grievances resolved.

17.1 SCOPE

The GRM provides a complaints and grievance procedure for PSC TL-OT-17-08 Drilling Campaign only. The procedure will cover or apply from the beginning of the social and environmental assessment process and exist throughout construction and operations phases through to the end of project life. This procedure does not cover or apply to Human Resources issues. This procedure will help provide a transparent and consistent process for resolving complaints and grievances against TR.

17.2 PRINCIPLES OF PROCESS

Grievance: An issue, concern, problem, or claim (perceived or actual) that an individual or community group wants a company or contractor to address and resolve.

Senior Management will provide active and sustained support to this procedure in order for it to be effective and gain legitimacy. The Operations Manager will be responsible for the implementation of the procedure supported by the Health, Safety and Environment (HSE) Officer, and the Community Affairs (CA) Manager and Officers.

The following principles will be applied to the GRM process:

- All complaints and grievances will be treated seriously and entered into the grievance register kept by Timor Resources.
- Strict confidentiality will be upheld.
- The guiding principles of negotiation, mediation and conciliation will be applied.

- All complaints and grievances will be dealt with a specified timeframe.
- No form of persecution, harassment or discrimination will be tolerated.
- Clear and appropriate communication is to occur throughout the process.
- A report will be filed at the completion of the complaints and grievances process

The structure of the GRM procedure is shown in Figure 29 see also Appendix C.

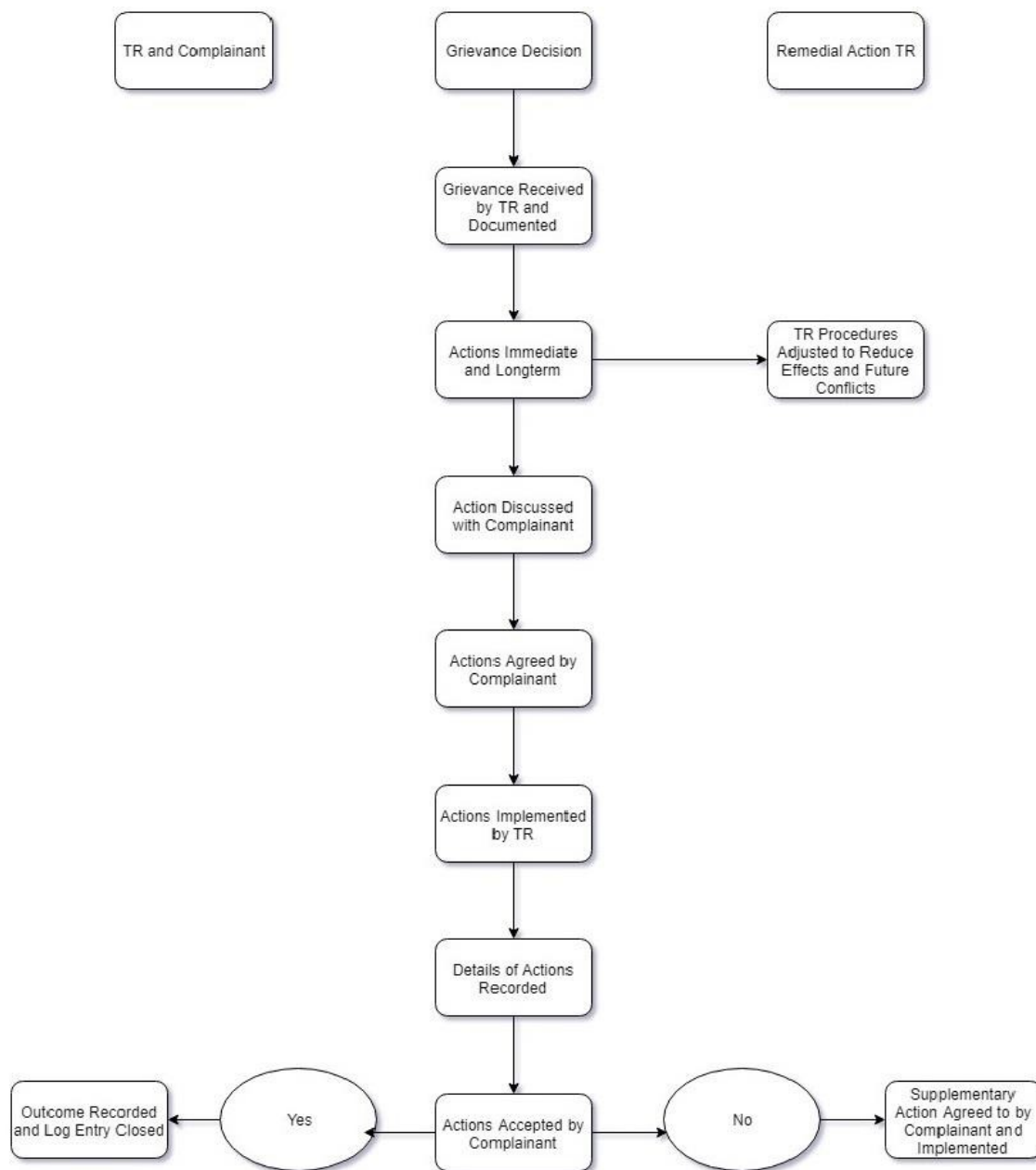


Figure 29 - GRM procedure structure
(After Appendix C)

18 WORK PLAN AND IMPLEMENTATIONS SCHEDULE

Table 23 - Work Plan and Implementation Schedule


	DRILLING CAMPAIGN IN TIMOR-LESTE (May be subject to variation, pending future updates on COVID-19, quarantine and flight restrictions)	START	FINISH
1	Rig Commissioning – Certification of Civil works Block A, land clearance and construction of well pads built. Subject to ANPM issuing Category A license	15/02/2020	28/04/2021
2	Kumbili-1 drilling (37 days)	01/05/2021	06/06/2021
3	Rig move (Kumbili to Karau 7 days)	07/06/2021	13/06/2021
4	Karau-1 drilling (26 days)	14/06/2021	09/07/2021
6	Civil Works Block C start (90 days) Subject to ANPM issuing Category A license for Block C	01/06/2021	01/09/2021
5	Rig move (Karau to Lafaek 7 days)	10/07/2021	17/07/2021
6	Lafaek-1 drilling	18/07/2021	10/09/2021
7	Rig move to block C (Relocate rig to Block C - 18 days)	11/09/2021	29/09/2021
8	Rusa-1 drilling	30/09/2021	16/11/2021
9	Rig Demob via Suai Port	16/11/2021	07/12/2021

19 COST ESTIMATE

The costs related to environmental mitigation measures are summarised in Table 24, this includes high cost capital equipment items such as blow-out preventers, diverter, emergency valves the flare line and pressure and flow monitoring equipment (see Items 1 and 2 below), all such items may be categorised as “environmental” spend as they perform environmental protection functions, e.g. preventing a blow out, monitoring high pressure events that could lead to a blow-out. Item 3 is a cost estimate for the mud chemicals which provide a key “barrier” down hole balancing downhole pressures so removing the risk of over-pressure and a blowout. Item 4 covers training costs for personnel and permitting costs, Items 6, 7 and 8 are costs to be considered as local costs in and around the project area.

Table 24 - Project Environmental Costs

	Item	Pre-Project/ Construction	Drilling	Decommissioning
1	Equipment Used for Environmental and Risk Mitigations. BOPS's, Diverter, ESD, Flare Line	\$3,400,000		
2	Pumps, Choke Lines, Pressure and Flow Monitoring, equipment redundancy	\$1,500,000	\$400,000	
3	Mud Weighting and Lost circulation	\$300,000	\$100,000	
4	Rig Certification, Crew training, Crew Certification, Rig maintenance, Approvals, Safety Case, HSE, Category A license	\$560,000	\$400,000	\$260,000
5	Air Noise Light Pollution Habitat, Baseline Studies.	\$200,000	\$180,000	\$120,000
6	Community and cultural, education, inclusion employment, procurement of goods and services, community relations, information sharing, celebrations, local sponsorship, land and surface leasing fees.	\$550,000	\$600,000	\$400,000
7	Civil construction, planning, equipment, logistics inside Timor-Leste incl. import duties, WHT	\$1,500,000	\$140,000	\$320,000
8	Decommissioning, Reforestation, removal of civil constructed sites, monitoring, reporting.	-	\$80,000	\$600,000

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20 REVIEW OF THE EMP

The EMP will be implemented through the Timor Resources Operating Management System. The mitigation measures identified for the management of potential environmental impacts will be integrated into the project design through the OMS.

The key OMS elements applied in the review and audit of the EMS are:

- Element 7 Operational Controls:
 - Health, Safety and Environmental Management
 - Management of Change
 - Contractor and Purchasing Management
 - Asset Integrity, Engineering and Project Management
- Element 9 Crisis and Emergency Management
- Element 10 Assurance
 - Inspection and Audit
 - Non-Conformance Corrective and Preventative Action
- Element 11 Performance and Compliance

The EMP and its frameworks may be subject to review for the various reasons:

- Changes of a plan, activity, process or procedure that is considered to pose any detrimental effect to project, human or environmental as whole; it also applicable for any positive changes that are considered to add value to the project, social or environmental as whole.
- Changes of responsibility towards any social and/or environmental aspects identified within the project EIS or EMP and its frameworks.
- Changes of any project related legislation that may require an update to the EMP and its frameworks.
- Changes of monitoring results that may require an update any threshold or environmental limit value identified within project EIS or EMP and its frameworks.

Table 25 - Timor Resources Operating Management System

PDCA CYCLE	OMS ELEMENT	OBJECTIVE
CORE	1. LEADERSHIP AND ACCOUNTABILITY	Provide visible leadership at Corporate and Business Unit level with clearly defined and documented authority and accountability. Champion Corporate culture, behaviours and performance.
PLAN	2. RISK ASSESSMENT AND CONTROL	Conduct comprehensive and routine assessment of the hazards and risks associated with activities and operations. Appropriate action is taken to control and mitigate risks. Conduct routine reviews.
	3. POLICIES, EXPECTATIONS AND LEGAL REQUIREMENTS	Policies, Expectations, Standards and legal requirements are properly identified, interpreted and tracked.
	4. OBJECTIVES, TARGETS AND IMPROVEMENT PLANS	Set Objectives and establish annual Targets and Key Performance Indicators. Define effective ways of measuring progress and performance. Specify how performance improvements will be achieved and assign responsibilities.
	5. ORGANISATION, RESOURCES AND CAPABILITY	Define and document organisational structure. Specify resource, competence and assurance requirements. Implement training, organisational learning, and competency development programs.
	6. DOCUMENTS AND RECORDS	Establish and maintain appropriate and practical documentation and records, document control and record management systems.
DO IMPLEMENTATION AND OPERATIONS	7. OPERATIONAL CONTROLS	Appropriate systems and controls are implemented and maintained for all HSE, Security, Engineering, Project, Asset Integrity, Process Safety and Operational activities. Monitor and report on the effectiveness of the systems, and establish mechanisms to prevent non-compliance, corrective and preventative action. Implement methods to manage change and controls for contractors.
	8. COMMUNICATIONS	Establish and maintain processes and procedures for effective communication of information internally and engagement with partners and all other stakeholders.
	9. CRISIS AND EMERGENCY MANAGEMENT	Develop Crisis and Emergency Management capability. Implement and maintain for all activities and operations. Plans are tested and personnel are trained in their expected roles.
CHECK ASSURANCE	10. ASSURANCE	Implement a routine Assurance program: inspection and audit, and a system for managing non-conformance. Report, investigate and analyse all incidents, and act effectively on results.
ACT	11. PERFORMANCE AND COMPLIANCE	Establish and maintain appropriate systems for monitoring and reporting performance and the status of Governance: compliance with and performance of Policies, Expectations, Standards and legal requirements. Assess the effectiveness of the OMS to deliver sustainable performance through management review.

21 NON-TECHNICAL SUMMARY

TETUM

Timor Resources Pty Ltd akiera ona rai maran PSC TL-OT-17-08 iha Municipio Covalima iha loron 7 de Abril 2017. Lisença ida ne'e cobre area kuaze 1445.2 km²; 1,057.8 km² rai maran no 387.4 km² extende ba tasi klaran ho distansia 7km, parte tasi ibun ho distansia 64 Km no kuaze 34.5 km husi tasi ibun tama ba iha rai maran.

Projeto ida ne'e halao ho intensaun atu halo perfurasaun ba iha posu mina lima ne'ebe mak identifika ona ho naran Kumbili, Karau, Lafaek, Laisapi no Raiketan. Posu mina hirak ne'e lokaliza iha Sub distrito Suai, Maukatar no Zumalai iha Municipio Covalima. Perfurasaun ne'e plano ona atu hahu iha inicio tinan 2021 ho rasaun tanba restrisaun ne'ebe implementa tanba pandemia Covid-19.

Posu mina lima ne'ebe identifika ona liu husi resultadu evaluasaun ne'ebe halao husi Timor Resources no ikus mai identifika duni area ne'ebe atu fura ba.

Metodo ne'ebe usa ba identifikasaun no estudu kona ba potencial impaktu ambiental husi projeto ne'e tuir rekeremento legislativo Timor Leste nian, ne'ebe mak define ona iha Dekreto Lei Numero 5/2011 no suporta husi Diploma Ministerial Numero 46 Ne'ebe mak esplika ona oinsa Timor Resources bele identifika impaktu husi projeto ne'e iha fase: Konstrusaun, operasaun no decommissionamento (Tempu remata nian)

Atividade prjeito nian sei bele fahe ba fase tolu relasiona ho estudu ba nia impaktu: konstrusaun, perfurasaun no deskomissionamentu. Sumario husi atividade perfurasaun nian Maka hanesan tuir mai

- **Asesu ba Rai** - Area nebe atu fura ba sei la precisa relokasaun ba comunidade, maibe karik sei iha akomodasaun alternativo ho durasaun temporario iha area Raiketan. Sei hadok an mos husi area kultural nian Ne'ebe iha. Prosesu ba usa no asesu ba rai sei inklui:
- Konsultasaun ho rai nain atu hetan sira nia akordu. Konsultasaun sira ne'e sei cobre mos impaktu no termus ne'ebe proposta ona husi usa rai refere, campo servico no desenvolve oportuniade ba negocio.
- Negosiasaun ho maneira ida ne'ebe rasoavel, fiar malu no respeito.
- Akordo ho comunidade ba usa sira nia rai, plano ba relokasaun no restorasaun no akordo ho comunidade se karik precisa halo relokasaun.
- Kompensasaun no aluga rai ho rai nain tuir lei ne'ebe mak aplika iha Timor-Leste, tuir Dekreto Lei Rai Maran. Pagamantu ba kompensasaun sei halao ho transparente no participa mos husi comunidade relevante no mos representante husi governo ou observador independente.

- **Survey Geoteknikal, Geokemikal and Topografia** - Survey ne'e halao hodi hatene topografia husi area refere no karakteristikas husi rai iha area posu mina no Estrada ho asesu ba iha prjeito fatin.
- **Hamos dalan ou rai ba loke dalan ba iha projeto fatin.** Rai leten ne'ebe suru no ai horis sei rai iha fatin ida atu bele usa fali hodi restaura fila fali fatin ne'e bainhira projeto remata.
- **Survey ba iha Estrada no ponte** - Survey hala'o tiha ona hodi hare Estrada ne'ebe iha, Ponte, Auto-estrada no halo ona mapamento ou plano ba transportasaun makina perfurasaun.
- **Estabelece supply ba be** - Be sei foti husi sub-contractor local. Total be ne'ebe mak sei usa mos sei konsidera atu nune'e la bele fo impaktu bae ma seluk atu usa.
- **Area posu mina** - area ba perfurasaun sei kobre rai ho medidas 100m x 100m. Rai tahu husi perfurasaun nian sei rai iha kuak rua ho medidas 18 x 20 x 3m no 14 x 30 x 3m. Kuak sira ne'e sei nahe ho membrana ne'ebe impermeable hodi nene'e bele prevene kontaminasaun ba iha rai. Kuak ne'e sei haleu ho lutu
- **Perfurasaun** - Perfurasaun sei halao tuir padraun ne'ebe iha ona no dokumentus relasiona ho planu perfurasaun sei hetan aprovasaun husi ANPM. Tempu ne'ebe mak precisa hodi finaliza perfurasaun ida sei han loron 30-50.
- **Teste ba posu mina** - Teste ba posu mina sei halao se karik perfurasaun ne hetan duni hidrocarbono (mina).
- **Movimento ba Rig** (equipamentos hodi halo perfurasaun) - Plano ba movimento rig nian husi fatin ida ba fatin seluk planeado ona no inklui mos avaliasaun ba Estrada nia luan, cruzamento, ponte, comunidade no infraestrutura publiku nian.
- **Dekomisionamento** - se karik posu nebe fura ona la iha mina, area refere sei restaura fila fali hanesan ho kondisaun anterior ou hanesan ho saida mak akordadu ona ho rai nain no aprova ona husi autoridade relevante.

Avaliasaun ba alternative balun mos halao ona ba iha projeto ne'e unclui:

- **Lokalizaun ba posu** - Posu mina nebe determina ona considera ona mos problema relasiona ho ambiental, social kultural no ekonomia.
- **Desenho ba projeto** - decisaun antes ne'e foti ona hodi decide halo perfurasaun vertical ou los deit tun ba rai okos tanba konsidera mos seguransa nomos kustu.
- **Fonte ba Be** - sub-contractor local mak sei fornese be tanba be ne'ebe mak percisa sei la fo impakto ba ema seluk atu usa mos be refere.

- **Eletricidade** - eletricidade ba iha rig sei fornese husi gerador diesel iha area projeto. Akampamento iha Haemanu sei usa eletricidade ne'ebe mak publiko hotu usa no mos gerador ida sai hanesan suplente.
- **Fatin rai cutting disposal** - cuttings sei falun ho forro impermeable iha area projeto nia laran.
- **Fluido husi perfurasaun** - Fluido sira ne'e sei usa fila fali durante period perfurasaun.
- **"La iha Projeto"**- Alternativo atu la iha projeto ne'e rejeitado

AMBIENTE

Atividade perfurasaun ida ne'e sei la halo impaktu negativo ne'ebe significante ba animal no ai-horis sira iha area refere tanba animal sira ne bele muda ba fatin seluk bainhira atividade perfurasaun hahu.

IMPAKTU POSITIVO

- **Kampo de trabalho**- Total posisaun 150-180 mak sei preenche hosi Timor oan durante actividade perfurasaun. Sei iha kombinasan entre posisaun kualifikada no la kualifikada nian iha ekipa ba perfurasaun, ekipa ba konstrusaun civil, ekipa geologista, ekipa seguransa, ekipa catering nian no sira ne'ebe tein, cleaners, no staff administrasaun nian.
- **Programa ba comunidade**- Timor Resources implementa ona programa ba comunidade inklui mos programa hortikultura ne'ebe lao diak los. Grupo ne'ebe mak iha rai hetan ona ajuda hanesan fini, irigasaun, no suporta financial atu hasa'e sira nia kapasidade atu kuda ai horis ou hahan ho valor commercial ne'ebe diak.
- **Keixa**- Membro comunidade bele hatoo keixa liu husi oficiais ba ligasaun komunitario. Sira nia keixa sei regista no avalia nia potencialidade atu kria risku no hatan ba kestaun sira tuir los ou hatoo ba jerrente senior. Aproximasaun ida ne'e sei halo fasil liu ba comunidade atu hatoo sira nia kestaun ne'ebe mak kauza husi actividade projeto nian.
- **Prokuramento ba sasan no services**-Prokuramento ba business ne'ebe mak halao husi Timor oan sira inklui maibe la limite ho:

- Hahan fresku no be	\$477,040.00
- Hela fatin/officina	\$186,000.00
- Fornece mina diesel	\$1,050,000.00
- Servisu de importasaun no customs clearance	\$62,000.00
- Aluga equipamentos pesadas, truck no cranes	\$190,000.00
- Konsultasaun ba impaktu ambiental	\$190,000.00
- Fatuk rahun no fatuk	\$140,00.00

IMPAKTU RESIDUAIS

Trafiku- movimentu trafiku ne'ebe mak aumenta karik sei inkomoda no iha possibilidade atu fo impaktu ba seguransa ema seluk ne'ebe mak usa Estrada. Maibe lokalisaun no estrada ne'ebe mak limitadu, programa ne'ebe mak ho durasaun badak sei limita possibilidade ba impaktu ne'e.

Rai- suru rai parte leten nian no kompaktasaun sei akontese durante fase konstrusaun no kontinua to'o fase dekommissionamentu no rehabilitasaun ba rai ne'e.

Kualidade ar- Kualidade ar karik sei redus husi rai rahun no emisaun gas durante fase operasaun karik sei inkomoda no karik sei fo impaktu ki'ik ba animal no ai horis iha area projeto. Programa perfurasaun ne'ebe badak (loron 30 ba kada posu) no usa gasoel ne'ebe mak la barak sei limita nia impaktu. Ho periodo projeto ne'ebe badak signifika nia impaktu mos sei akontese iha tempu badak nia laran.

Lixo Solido – tuir lalaok projeto nian, lixo solido sei existe, jestaun lixo nian sei oferese solusaun nebe diak atu maneja lixo solido sira ne'e, maibe, metodo principal insinerasaun (sunu) sei resulta emissao ba atmosfera.

Barulhu- Atividade perfurasaun sei halao durante loron no kalan (24 horas) no loron hitu kada semana. Tamba ida ne'e, karik sei inkomoda comunidade local no animal fuik sira. Maibe, durasaun projeto sei hotu iha tempu badak e tamba ida ne'e, nia ipaktu mos sei akontese durante tempu ne'ebe badak.

Konsultasaun Publiku

Apresentasaun ba programa halo ona ba komuidade local iha area ne'ebe besik ba iha posu lima ne'ebe atu fura.

Partisipante iha konsultasaun publiko inklui comunidade local, lideres locais hanesan Chefe Suco, Chefe Aldeia no juventude local no mos representante husi autoridade local hanesan Administrador Municipio, Administrador sub distrito no vise komando PNTL. Konsultasaun publiku halo iha fatin sira hanesan tuir mai ne'e:

- Segunda, 21 de Outubro 2019 iha Sede suco Kamenasa.
- Tersa, 22 de Outubro 2019 iha Sede suco Belecasac
- Kuarta, 23 de Outubro iha Sede suco Matai
- Kinta, 24 de Outubro 2019 iha sede suco Labarai
- Sexta, 25 de Outubro 2019 iha sede suco Tashilin.

CONCLUSAUN

Proposta atu halo mitigasaun planeado ona hodi hatan ba iha impaktu residual hodi bele mos proteje ambiente physical, biologia, no socio-economikal. Sistema jestaun ambiental desenvolve ona atu bele maneja impaktu ne'ebe karik sei akontese no garante katak sei halo tuir nafatin durante programa ne lao.

REKOMENDASAUN

Rekomendasaun principal sira mak hanesan tuir mai ne'e:

- Kria Sistema atu bele hodi simu reklamasan no sei implementa durante period projeto nian
- Oficiais ba ligasaun ho comunidade sei mantem kontaktu ho comunidade no parte interesada sira no mantem informa ba comunidade kona ba fase husi projeto nian no atividade, programa no impaktu potensial balu.
- Atividade hotu sei halao tuir lei ne'ebe aplikavel inklui mos lei Nu.3 2012 konaba autoridade legislativo ba problema ambiental, Lei numero 26 2012 konaba lei basico ambiental, Dekreto Lei numero 18/2020 konaba atividade petrolifero iha rai maran.
- Atividade hotu sei halao tuir Timor Resources nia Sistema Saude Seguransa Ambiental no Padraun ne'ebe iha.
- Konsulta ho administrasaun local no agencia seguransa atu suporta iha parte seguransa.
- Kordena ho comunidade local durante prosesu rekrutamento.
- Implementa Sistema de jestaun ba lixu no acorda praticas jestaun lixu no facilidades nian, em consulta ho municipio.
- Lixu so bele transporta husi kompanhia ne'ebe hetan ona aprovasaun atu transporta lixu.
- Implementa Sistema de jestaun ba trafiku no reforsa limite de velocidade hodi bele minimiza rai rahun.
- Utiliza dalan ne'ebe mak iha nanis ona se possivel.
- Minimiza hamos ou tesa ai horis
- Prepara plano ba rehabilitasaun
- Implementa Sistema de jestaun ba qualidade ar no barulho
- Implementa Sistema de jestaun ba incidente hanesan: Plano jestaun de Krise – Corporativa, Plano de jestaun ba incidente – Nasional, no Plano hodi resposta ba situasaun emergencia, plano hodi resposta ba Mina fakar – local.

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APPENDIX A - WASTE MANAGEMENT PLAN

TR-HSE-PLN-007



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APPENDIX B - REHABILITATION PLAN

TR-HSE-PLN-008



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APPENDIX C - REDRESS AND GRIEVANCES PLAN

TR-HSE-PLN-009



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APPENDIX D - OIL SPILL CONTINGENCY PLAN

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APPENDIX E - TRAFFIC MANAGEMENT PLAN

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APPENDIX F - INSPECTION SCHEDULES

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APPENDIX G - NOISE MANAGEMENT PLAN

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APPENDIX H - INCIDENT REPORTING AND INVESTIGATION STANDARD

TR-GEN-STD-00-000-010_3



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APPENDIX I - COMMUNITY CONSULTATION

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APPENDIX J - AIR QUALITY PLAN

TR-HSE-PLN-014