AL DEBARAN ENERGY (PRIVATE) LIMITED

PROJECT PROPONENT

STATUTORY ENVIRONMENTAL DOCUMENT

ENVIRONMENTAL IMPACT ASSESSMENT

(EIA) REPORT

FOR

PROPOSED LPG STORAGE AND FILLING PLANT

AT NAZIMABAD KOWARDU, TEHSIL & DISTRICT SKARDU,
GILGIT-BALTISTAN

LPG Storage & Filling Facility — Representative Site View

Prepared in accordance with the Gilgit-Baltistan Environmental Protection Agency (Review of IEE and EIA) Regulations, 2024, and the Gilgit-Baltistan Environmental Protection Act, 2014

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PREPARED BY

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GILGIT-BALTISTAN • PAKISTAN

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List of Abbreviations

Abbreviation	Description
AA	Ambient Air
AD	Assistant Director
AOI	Area of Influence
BCP	Building Code of Pakistan
BDL	Below Detection Level
dB(A)	Decibel (A-weighted)
DHQ	District Head Quarter
DG	Director General / Diesel Generator (as per context)
EA	Environmental Assessment
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMMP	Environmental Monitoring and Management Plan
ERT	Emergency Response Team
ESIA	Environmental and Social Impact Assessment
GB	Gilgit-Baltistan
GB-EPA	Gilgit-Baltistan Environmental Protection Agency
GIS	Geographical Information System
GPS	Global Positioning System
HSE	Health, Safety and Environment
IEE	Initial Environmental Examination
KVA	Kilo-Volt-Ampere
LGO	Local Government Ordinance
LPG	Liquefied Petroleum Gas
MT	Metric Ton
M & M	Mines and Minerals
MV	Medium Velocity
NEQS	National Environmental Quality Standards
NGO	Non-Governmental Organization
NOC	No Objection Certificate

Abbreviation	Description
OGRA	Oil and Gas Regulatory Authority
OHS	Occupational Health and Safety
PEPA	Pakistan Environmental Protection Act
PPE	Personal Protective Equipment
RSPM	Respirable Suspended Particulate Matter
SOP	Standard Operating Procedure
STP	Sewage Treatment Plant
TDS	Tank Decantation Shed

Executive Summary

This Executive Summary presents the key findings of the Environmental Impact Assessment (EIA) carried out for the proposed LPG Storage and Filling Plant of M/S Al Debaran Energy Private Limited, located at Nazimabad Kowardu, Tehsil and District Skardu, Gilgit-Baltistan. The project seeks to provide a safe, reliable and economical supply of Liquefied Petroleum Gas (LPG) to Skardu and the surrounding Baltistan region, reducing the area's continuing dependence on firewood and thereby easing pressure on the region's already limited natural forest cover.

The plant is designed around two mounded storage bullets of 50 metric tons capacity each (100 MT aggregate storage), with a cylinder filling capacity of 10 MT per day. The facility is sited on 21 Kanals 11 Marlas of proponent-owned land at Nazimabad Kowardu, at a distance from the nearest settled community, and incorporates gas detection, fire-fighting, and emergency shut-down systems designed to OGRA and applicable international LPG-handling standards.

This report has been upgraded from the earlier Initial Environmental Examination (IEE) prepared for the project to a full Environmental Impact Assessment (EIA), in line with the categorization of LPG storage and filling facilities and the screening criteria set out under the GB-EPA (Review of IEE and EIA) Regulations, 2024. The EIA expands the baseline characterization, impact evaluation, and management planning of the original IEE, and adds the elements specifically required of an EIA-level submission: a structured stakeholder and public consultation process, a monitoring programme with defined parameters, locations and frequencies, a more detailed Environmental Management Plan with associated cost estimates, and a dedicated risk and hazard assessment for the storage and handling of a pressurized flammable gas.

Baseline surveys were carried out covering the physical (topography, geology, soils, climate, air quality, noise), biological (flora, fauna, aquatic ecology) and socio-economic environment (demography, land use, livelihoods, health, education, water supply and sanitation) of the project area and its area of influence. The project site itself is largely barren, non-agricultural land with sparse natural vegetation; the nearest populated settlement, Kowardu, lies approximately 4 km from the site.

Potential impacts identified during construction include dust generation, construction noise, vehicular emissions, and generation of construction waste — all localized, short-term, and manageable through standard mitigation. During operation, the principal environmental and safety concerns relate to the accidental release of LPG vapour, fire and explosion hazard, spillage during unloading and transfer operations, and management of domestic wastewater and solid waste generated by plant staff. Mitigation measures, engineering controls, and a monitoring programme have been developed for each of these impacts and are detailed in Chapters 5, 6 and 8 of this report.

A structured public consultation and departmental consultation process was carried out as part of this EIA (Chapter 7), consistent with the Guidelines for Public Consultation and the requirements of the 2024

Regulations. Community and departmental feedback obtained through this process has been incorporated into the design of the mitigation and monitoring plans.

As part of its Corporate Social Responsibility, the proponent has undertaken several community-benefit works ahead of and alongside project development, including the purchase of land to provide road access to the adjacent community, realignment and widening of bottlenecked sections of the unmetalled access road between Kowardu village and the project site to allow heavy transport and general traffic to pass safely, and the earmarking of six Kanals of land within the plant premises for development as a green belt. These initiatives are detailed in Chapter 6.

Based on the assessment presented in this report, it is concluded that, subject to full implementation of the Environmental Management Plan, the Emergency Response Plan, and the monitoring programme set out herein, the proposed project's residual environmental, health and safety impacts can be maintained within acceptable limits, while the project delivers substantive local benefit through employment, improved energy access, and reduced deforestation pressure in the Skardu-Baltistan region. Total project cost is estimated at approximately PKR 56.03 million, with additional environmental management and monitoring costs identified in Chapter 6 of this report.

Chapter 1: Introduction

1.1 Background

Al Debaran Energy Private Limited operates under the leadership of its management team and is supported by a trained and experienced workforce. The company is committed to operational excellence while creating sustainable value for its customers, employees and other stakeholders. Through continuous improvement, adherence to industry best practice, and a focus on quality and safety, Al Debaran Energy Private Limited has established itself within the LPG sector serving Skardu and the wider Baltistan region.

The company places a high priority on regulatory compliance and has ensured that all aspects of its LPG storage and filling operations are designed to conform to applicable national and international standards. By implementing stringent Health, Safety and Environment (HSE) measures, maintaining modern infrastructure, and following established operating procedures, Al Debaran Energy Private Limited aims to ensure the safe handling, storage and distribution of LPG while protecting people, the environment, and its business interests.

This report presents the Environmental Impact Assessment (EIA) prepared for the proposed LPG Storage and Filling Plant at Nazimabad Kowardu, District Skardu. The purpose of this study is to establish the environmental baseline — physical, biological and socio-economic — of the project area and its area of influence; to assess the impacts likely to arise during the construction and operational phases of the project; to identify appropriate mitigation measures to eliminate or reduce those impacts to an acceptable level; and to formulate an Environmental Management Plan (EMP), monitoring programme, and Emergency Response Plan for implementation of the project in an environmentally responsible manner.

1.2 From IEE to EIA: Basis for this Report

An Initial Environmental Examination (IEE) was earlier prepared for this project by Eco Solution and Services Pvt Ltd. Following review of the project's storage capacity, hazard profile, and proximity considerations against the screening criteria of the GB-EPA (Review of IEE and EIA) Regulations, 2024, the study has been elevated to a full Environmental Impact Assessment (EIA). This EIA report supersedes the earlier IEE and incorporates all of its baseline findings, while extending the assessment to meet EIA-level requirements, including:

- A more detailed baseline characterization of the physical, biological and socio-economic environment, supported by a defined field monitoring programme (Chapter 4);
- A structured, documented public consultation and inter-departmental consultation process (Chapter 7);
- A dedicated hazard identification and risk assessment for LPG storage, handling and transport (Chapter 5);
- An expanded Environmental Management Plan (EMP) with defined institutional responsibilities, monitoring parameters, and associated cost estimates (Chapter 6); and
- A revised Emergency Response Plan aligned with OGRA and NEQS requirements (Chapter 8).

1.3 The Proponent

Particular	Detail
Company Name	Al Debaran Energy Private Limited
Chief Executive Officer	Mr. Moazzam Saghir
Registered Address	House No. 410, Nazim-ud-Deen Road, Sector F-11/1, Islamabad
Project Site Address	Nazimabad Kowardu, Tehsil & District Skardu, Gilgit-Baltistan
Contact	0334-9622220
Sector	LPG Storage, Filling and Distribution

This report has been prepared to the format prescribed by GB-EPA to facilitate the Agency's review and the issuance of environmental approval for the project.

1.4 The Project

Al Debaran Energy Private Limited operates a trade complex at Kowardu, Skardu, comprising 21 Kanals 11 Marlas of land at Nazimabad Kowardu, with a sub-office located within the LPG plant premises. The proponent introduced LPG supply at an economical price as an alternative fuel in Skardu for the first time, with the specific objective of reducing local dependence on firewood and fruit-bearing trees for domestic heating and cooking — a practice that has placed increasing pressure on the region's natural forest cover and agricultural tree stock as population and heating demand have grown.

The LPG plant was designed by qualified engineers and is equipped with a storage capacity of 100 Metric Tons (two mounded bullets of 50 MT each) and a cylinder filling capacity of 10 MT/day. In view of increasing market demand across Baltistan, the Board of Directors of Al Debaran Energy Private Limited has approved enhancement of supply capacity, and the company is pursuing certification from the Oil and Gas Regulatory Authority (OGRA) for the plant's operation. OGRA has directed the proponent to first obtain environmental approval from GB-EPA, in line with Section 16 of the Gilgit-Baltistan Environmental Protection Act, 2014, which requires that an IEE or EIA (as applicable) be filed and approval obtained before commencement of construction or operation.

Total project cost is estimated at approximately PKR 56.03 million, inclusive of process equipment, fire-fighting systems, civil works, and safety systems (see Chapter 2 and Chapter 6 for a detailed cost breakdown).

1.5 Justification of the Project

Rapid population growth and expanding commercial activity in Skardu and the wider Baltistan valley have significantly increased demand for a safe, affordable domestic and commercial fuel. Historically, this demand has been met substantially through firewood and biomass, a pattern that directly contributes to deforestation and loss of fruit-bearing trees, and that carries associated public health costs from indoor air pollution. The proposed LPG plant is intended to provide a cleaner, more efficient substitute fuel, supporting both climate-change mitigation objectives and forest conservation in a region where natural forest cover is limited and ecologically significant.

1.6 Project Location

The proposed project is located at Nazimabad Kowardu, Skardu, on a plot of 21 Kanals covering Plot Nos. 651, 653, 663 and 675, Moza Satrang Do Nagmo, District Skardu. The site lies in the northeast of Kowardu, Skardu city, and is accessible via a jeep road connecting to the Kowardu–Shigar road. The nearest populated locality, Kowardu, is situated approximately 4 km from the project site (see Chapter 4 for detailed baseline description and Annexure for the site layout plan).

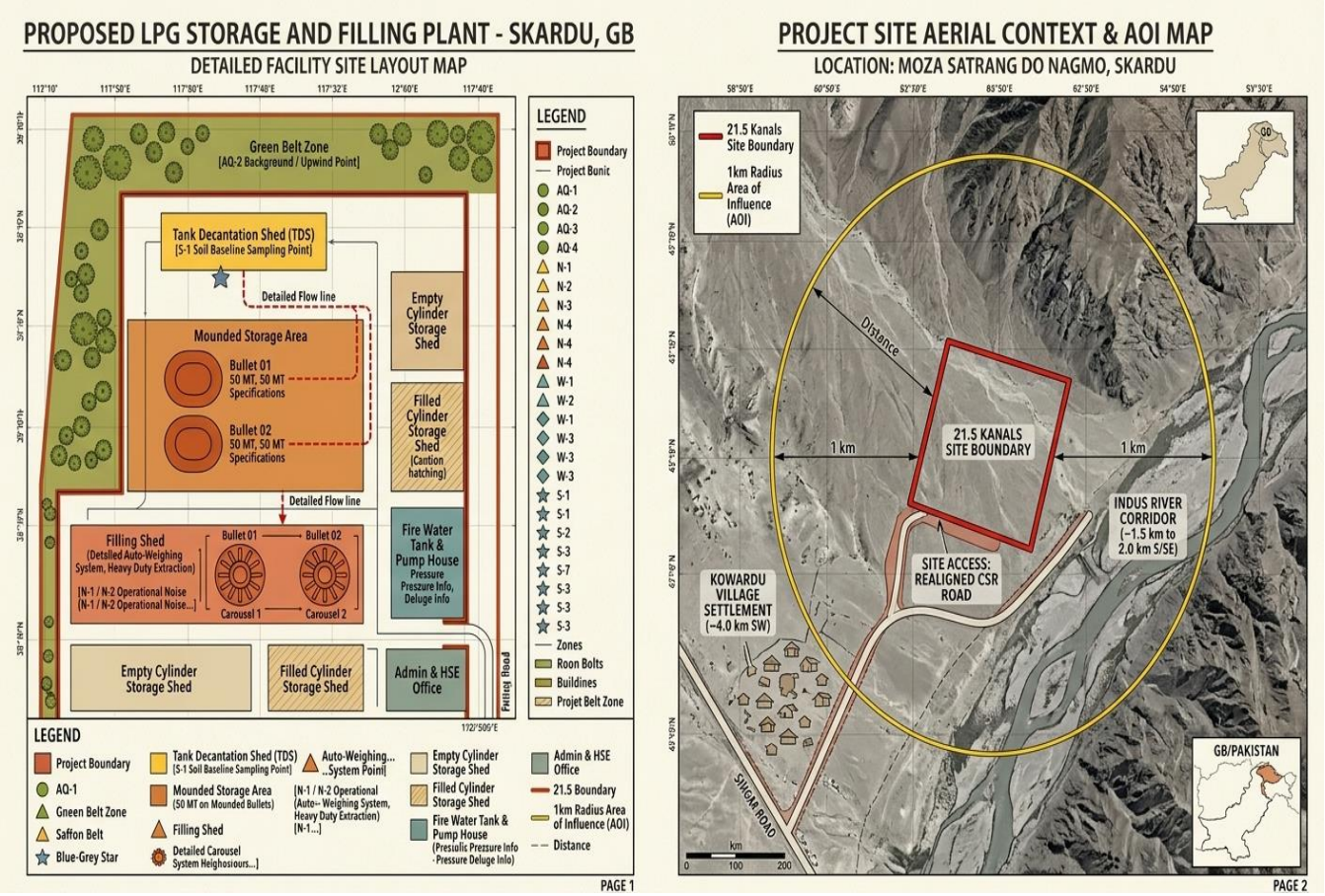


Figure 1 (a): Technical engineering layout plan alongside an annotated satellite aerial context map, highlighting internal process zones and regional spatial surroundings.

Figure 1 (b): Aerial satellite map delineating the 1.0km Area of Influence (AOI) buffer around the project site, showing spatial distances to Kowardu Village ($\sim 4.0\text{km}$ SW), the Indus River Corridor ($\sim 1.5\text {--}2.0\text{km}$ S/SE), and the CSR access road connection.

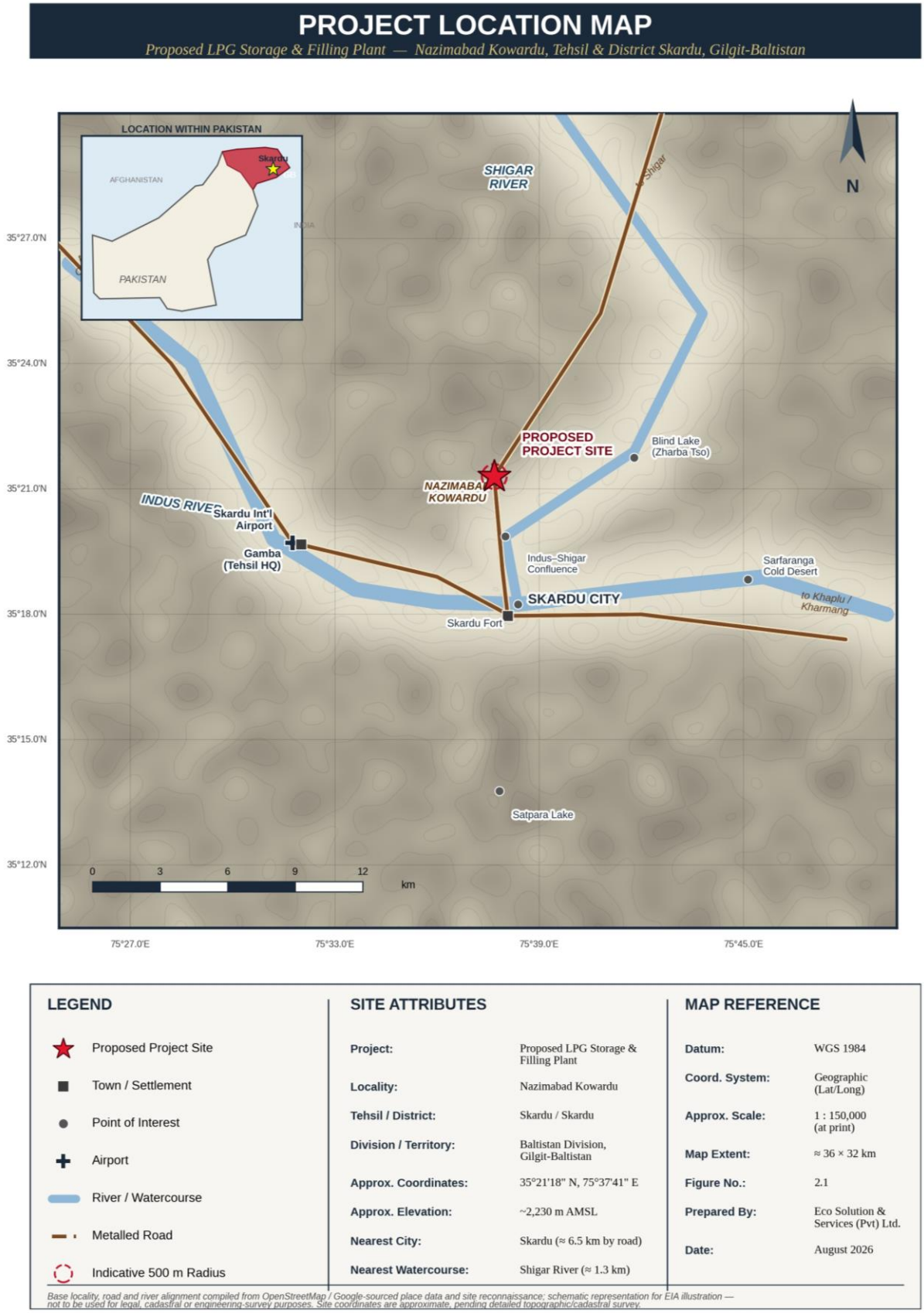


Figure 2: Project Location Map showing the proposed site of the LPG Storage and Filling Plant at Nazimabad Kowardu, Tehsil & District Skardu, Gilgit-Baltistan, in relation to Skardu city, the Indus and Shigar Rivers, and the regional road network.

1.7 Scope and Objectives of the EIA

This EIA has been carried out to provide GB-EPA and other relevant departments with the information needed to evaluate the environmental and social soundness of the proposed project prior to granting environmental approval. The specific objectives of this assessment are to:

1. Fulfil the regulatory requirements of the Gilgit-Baltistan Environmental Protection Act, 2014 and the GB-EPA (Review of IEE and EIA) Regulations, 2024;
2. Establish the physical, biological and socio-economic baseline of the project area and its area of influence;
3. Identify, categorize and evaluate the significance of positive and negative impacts likely to arise during the construction and operational phases;
4. Assess hazards specific to LPG storage, handling and transport, including fire, explosion and toxic release scenarios;
5. Recommend mitigation measures and formulate an Environmental Management Plan (EMP), monitoring programme, and Emergency Response Plan;
6. Document the public consultation and departmental consultation process and incorporate stakeholder feedback into project planning; and
7. Provide the public and relevant departments the opportunity to understand the project and its implications for the community and environment, in the context of sustainable development.

1.8 Methodology

The EIA was conducted through the following sequential steps.

1.8.1 Screening and Scoping

The project was screened against Schedules I and II of the applicable IEE-EIA framework and the GB-EPA (Review of IEE and EIA) Regulations, 2024, to confirm its categorization and to identify the Valued Environmental and Social Components (VECs) requiring detailed assessment — principally air quality, noise, soil and groundwater, occupational and public safety (fire/explosion/toxic release), and socio-economic conditions of the surrounding community.

1.8.2 Understanding of the Proposed Project

This step involved collection of design and operating data from the proponent, Al Debaran Energy Private Limited, through meetings held to clarify the nature of activities in each project phase and the likely magnitude of impact on the physical and social environment. This information was used to screen potential impacts during construction and operation.

1.8.3 Review of Legislation and Guidelines

Applicable national and Gilgit-Baltistan legislation, international agreements, and sectoral guidelines were reviewed to establish the regulatory standards against which the project has been assessed (see Chapter 3).

1.8.4 Secondary Data Collection

Published and unpublished data relevant to the project area — including prior environmental studies, meteorological records, and regional socio-economic data — were reviewed to inform the baseline description in Chapter 4.

1.8.5 Field Data Collection and Baseline Monitoring

The EIA team conducted site visits to the project area to collect primary baseline data on physical, biological and socio-economic conditions, using a structured field checklist. Ambient air quality, noise levels, and soil and water sampling were carried out at representative locations as described in Chapter 4; results, sampling locations and site photographs are presented in that chapter and its annexures.

1.8.6 Stakeholder and Departmental Consultation

A public hearing and a series of departmental consultations were conducted as part of this study, consistent with the GB-EPA Guidelines for Public Consultation. The process, attendance, issues raised, and the proponent's response are documented in Chapter 7.

1.8.7 Impact Assessment and Management Planning

Baseline and consultation findings were used to identify and evaluate potential impacts (Chapter 5) and to formulate the Environmental Management Plan, monitoring programme, and Emergency Response Plan (Chapters 6 and 8).

1.9 EIA Study Team

This EIA has been prepared by Eco Solution and Services Pvt Ltd, comprising environmental engineers, environmental scientists, and specialists with relevant sectoral experience. The composition of the study team, and the specific responsibility of each member within this assessment, is summarized below.

Name	Qualification / Designation	Role in this EIA
Mr. Ehsan Ali	M.Phil. Environmental Science]	Team Lead / Report Compilation
Engr. Arif Hussain	Civil Engineer	Baseline Survey — Physical Environment
Dr. Attarad Ali	PhD in Environmental Sciences	General Supervision
Dr. Ishtiaque Hussain	PhD in Hydro-Geology	Water Quality/ Hydro-geo Analysis
Dr. Alamdar Hussain	PhD in Ecology & Climatology	Baseline Survey — Biological Environment
Dr. Jafar Aman	PhD in Sociology	Socio-economic Survey and Public Consultation
Hamid Hussain	MS in Disaster Risk Reduction	Hazard and Risk Assessment
Muhammad Abbas	MPhil Biological Sciences	Field Sampling — Air, Noise, Soil, Water

Note: Team member names and qualifications are to be finalized and inserted by Eco Solution and Services Pvt Ltd prior to submission, together with CVs to be attached as an annexure, as required under the GB-EPA (Review of IEE and EIA) Regulations, 2024.

1.10 Limitations of the Study

This assessment has been prepared on the basis of design information provided by the proponent, published secondary data for the Skardu-Baltistan region, and field observations and measurements taken during the site

visits identified in Chapter 4. Where site-specific instrumental records (e.g., a continuous meteorological or air-quality monitoring station) do not exist for Kowardu, regional data from the nearest representative station has been used and is identified as such. Seasonal variation in some parameters (e.g., surface water flow, dust levels under varying wind conditions) may not be fully captured by monitoring conducted during a single field campaign; this is addressed through the ongoing monitoring programme proposed in Chapter 6, which is intended to supplement the baseline established here throughout the project's construction and operational life.

Chapter 2: Project Description

2.1 Overview

The proposed project involves the establishment of a Liquefied Petroleum Gas (LPG) Storage and Filling Plant at Nazimabad Kowardu, District Skardu, Gilgit-Baltistan. The project has been initiated to meet increasing demand for a clean, reliable and efficient cooking and heating fuel in Skardu and the surrounding Baltistan region. With rapid urbanization, population growth, and expansion of commercial activity in the region, the need for a safe and dependable LPG distribution network has become increasingly important. The proposed facility is intended to ensure a continuous supply of LPG while reducing dependence on traditional biomass fuels such as firewood, thereby supporting both environmental protection and public health.

The plant will receive bulk LPG by road tanker from licensed suppliers and transfer it into certified pressure storage vessels designed and constructed to applicable national and international safety standards. From the storage vessels, LPG will be filled into cylinders of various capacities using filling equipment fitted with automatic weighing and leak-detection mechanisms to ensure accurate, safe filling operations.

2.2 Analysis of Alternatives

As required for an EIA-level assessment, the following alternatives were considered by the proponent in arriving at the proposed project configuration and location.

2.2.1 No-Project Alternative

Under the no-project alternative, the existing pattern of energy consumption in Kowardu and the wider Skardu valley — heavily reliant on firewood and biomass for cooking and heating — would continue. This alternative was assessed as environmentally unfavourable relative to the proposed project: continued reliance on firewood sustains pressure on the region's limited natural forest and fruit-tree cover, contributes to indoor air pollution and associated respiratory health impacts, and forecloses the local economic and employment benefits associated with an organized LPG supply chain. The no-project alternative was therefore not preferred.

2.2.2 Site Alternatives

The selected site at Nazimabad Kowardu was evaluated against the requirement, common to LPG storage facilities, for a location with adequate separation distance from dense residential settlement, direct road access for tanker movement, stable ground conditions, and land tenure that is unencumbered and verifiable. The selected site meets these criteria: it is situated on land already owned by the proponent (21 Kanals 11 Marlas, under Mutation No. 673), is approximately 4 km from the nearest populated locality (Kowardu), is accessible via the Kowardu–Shigar road, and is underlain by stable, non-agricultural, semi-boulder ground unsuitable for cultivation (see Chapter 4). Alternative sites closer to Skardu town were considered less favourable owing to proximity to denser settlement and the consequently larger population within the hazard-consequence radius of an LPG storage facility.

2.2.3 Technology Alternatives

Mounded (earth-covered) bullet storage was selected in preference to above-ground spherical or horizontal vessel storage. Mounding provides passive fire protection and reduces vulnerability of the storage vessels to external radiant heat, projectile impact, and extreme temperature variation — a relevant consideration given the

site's high-elevation, high-diurnal-temperature-range climate (Chapter 4). This is consistent with contemporary good practice for LPG storage facilities in seismically active, mountainous terrain.

2.3 Project Components

The proposed LPG Storage and Distribution Plant comprises two principal functional areas: the LPG plant proper, and the administration block.

2.3.1 LPG Plant

- 02 storage tanks (mounded bullets), 50 metric tons capacity each (100 MT aggregate)
- Empty cylinder storage shed
- Filled cylinder storage shed
- Weight and leak-checking area
- Emergency water storage tank
- Fire Prevention System
- Gas Monitoring System
- Fire hydrant / water spray network
- Emergency trip buttons and manual call points
- Medium Velocity (MV) spray system
- Portable fire extinguishers

2.3.2 Administration Block

- Offices
- Kitchen
- Generator room
- Toilets (staff) and septic/soak-pit based sanitation system — see Section 2.7
- Guard room with toilet
- Store for machinery and materials

2.4 Site Layout and Land Use

The plant layout has been designed to maintain the safety separation distances required between storage vessels, process units, and the site boundary, consistent with applicable engineering standards. The site layout plan, prepared by the project's engineering consultant (M/S Kazmi Engineering), is provided as an annexure to this report and referenced in Chapter 6 for siting of the proposed green belt.

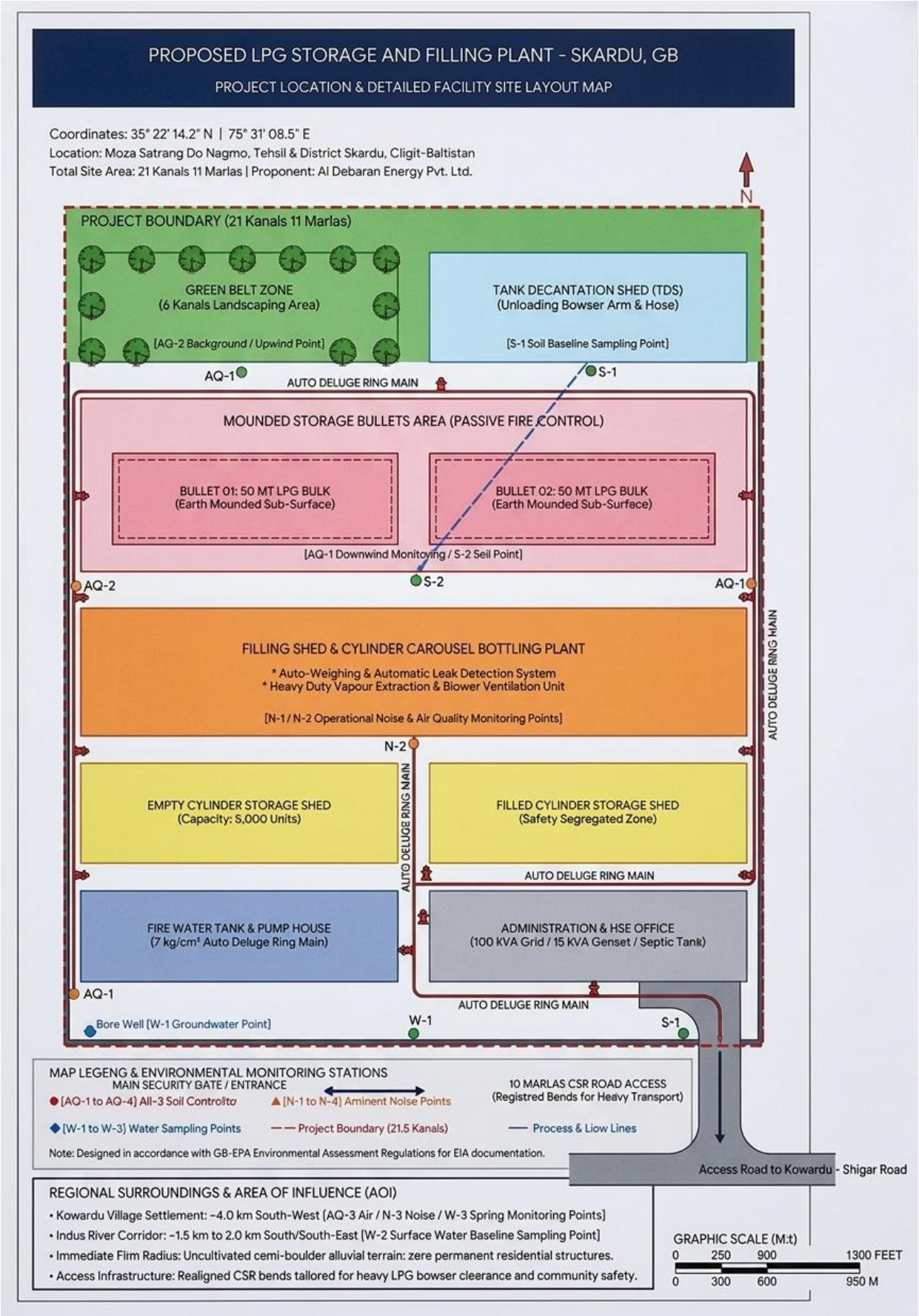


Figure 3: Detailed CAD-style site layout plan displaying exact building dimensions, safety clearance distances, mounded LPG storage bullets, cylinder carousel bottling plant, decantation shed, fire water deluge system, and peripheral green belt buffer.

2.5 Energy and Water Requirements

Requirement	Detail
Grid power	100 KVA from GB Power Department
Standby generation	15 KVA diesel generator (alternate arrangement for grid interruption)
Solar provision	80 KV solar panel capacity as supplementary/alternate arrangement
Primary water source	Groundwater via bore well(s)
Secondary water source	Indus River water, if required
Water use	Firefighting reserve, sanitation, dust suppression during construction, general plant use

2.6 Manpower and Project Schedule

The plant will be operated by a trained core staff complement covering plant operations, filling and quality-control functions, security, and administration, supplemented by contracted labour during the construction phase. Indicative staffing and phasing are summarized below; final staffing will be confirmed at the operational readiness stage.

Phase	Indicative Duration	Indicative Workforce
Construction (civil works, tank installation, piping, electrical, fire systems)	8 to 10 months	25 to 35 total (8–10 skilled technicians + 17–25 unskilled labourers, majority sourced locally where possible)
Pre-commissioning (testing, hydro-testing, OGRA inspection)	3 to 4 weeks	8 to 10 total (Contractor core specialists, proponent technical lead, and OGRA/Third-Party inspectors)
Operation	Ongoing	Plant Manager, Operators, Filling staff, Security, Administration — approx. 12 to 15 persons

Note: precise workforce numbers and construction duration are to be confirmed by the proponent/EPC contractor and inserted prior to submission.

2.7 Process Description

2.7.1 LPG Receipt and Storage

LPG will be received through road tankers, as per OGRA recommendations, from licensed sources and stored in two mounded bullets of 50 MT capacity each. Each storage vessel is fitted with a single liquid inlet/outlet line at the bottom and a vapour inlet/outlet line at the top, connected to the LPG vapour compressor. Two safety relief valves are provided on the top of each storage vessel, and all vessels are fitted with Servo level gauges.

2.7.2 Unloading

Road tankers are unloaded in the Tank Decantation Shed (TDS) and connected to the liquid and vapour lines of the mounded bullet via an unloading arm fitted with an excess-flow check valve and isolation valve. LPG is transferred by the differential-pressure method: vapour is drawn from the storage bullet, compressed, and used

to pressurize the road tanker, displacing liquid LPG into the mounded bullet. On completion, the compressor suction is reversed to recover residual vapour from the road tanker until suction pressure falls from approximately 11.6 kg/cm² to 2 kg/cm².

2.7.3 LPG Pumps and Vapour Compressors

Vertical cam-type LPG pumps draw suction from the base of the mounded bullets and deliver liquid LPG to the filling carousel. Screw-type LPG vapour compressors, fitted with a suction knock-out drum to trap condensed liquid, are used both for tanker unloading (pressurization) and for vapour recovery.

2.7.4 Air Compressor and Air Drying Unit

Two non-lubricated screw-type air compressors supply plant/service air and instrument air (7 kg/cm²a, relative humidity at –15°C), located at a safe distance from LPG-handling facilities.

2.7.5 Cylinder Filling, Weight Checking and Leak Testing

Empty cylinders are drawn from the empty-cylinder storage shed into the filling shed, where a gross-weighing carousel filling machine, preset to the required net fill, is used. After filling, each cylinder is checked on a weighing scale (off-specification cylinders are diverted to a weight-correction unit) and tested for valve leakage using a gas detector before being moved to the filled-cylinder storage area. Cylinders with defective valves are processed through a Valve-Change-Without-Evacuation unit.

2.7.6 Storage and Dispatch

Filled cylinders, after leak and weight testing and fitting of safety caps, are stacked in the filled-cylinder shed and dispatched only to the approved godowns of authorized LPG distributors. Drivers transporting LPG are required to hold a valid licence and receive training in safety and fire-fighting procedures.

2.8 Process Flow

No manufacturing process is involved in this facility; the operation consists of four stages:

1. Receipt of bulk LPG by road tanker
2. Storage of LPG in mounded storage vessels
3. Filling of LPG into cylinders (domestic/commercial)
4. Dispatch of filled cylinders by vehicle/truck to authorized distributors

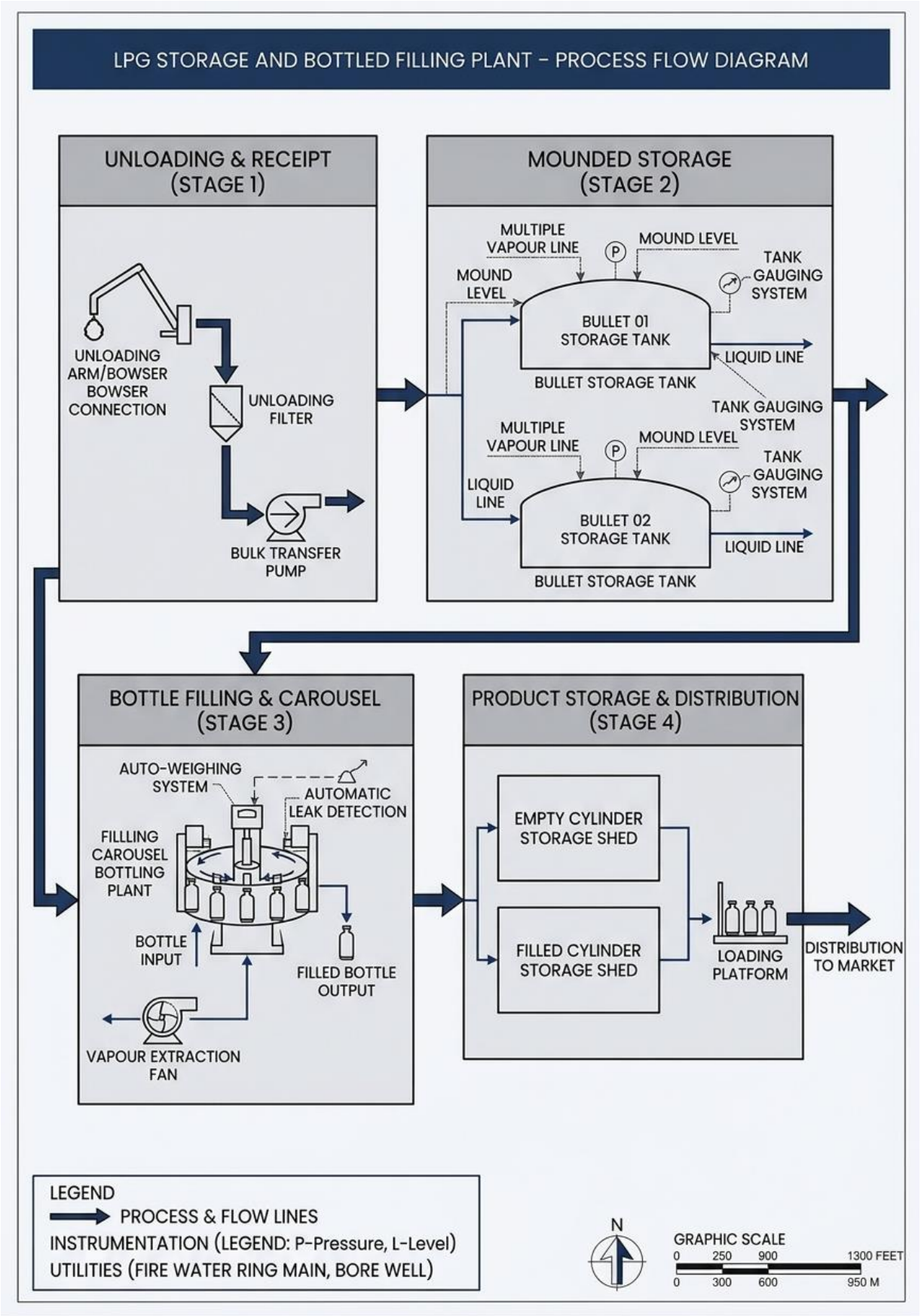


Figure 4: LPG Plant Process Flow Diagram (PFD) A multi-stage technical schematic detailing the sequential flow from Stage 1: Bowser Unloading & Receipt, through Stage 2: Mounded Bulk Storage, to Stage 3: Automated Cylinder Filling, and concluding with Stage 4: Product Storage & Market Distribution.

2.9 Fire Prevention and Detection Systems

Consistent with OGRA standards, the following systems are provided at the plant:

- Gas Monitoring System — gas-detecting sensors linked to a computerized processing unit, with alarm panels at the control room, filling shed, plant manager's cabin, and security gate, located at all sensitive/potential hazard points.
- Air/Vapour Extraction System — blower-and-duct system extracting leaking LPG vapour from floor level in the filling shed, interlocked with the filling system so the blower must run before the carousel can operate; a standby blower is provided.
- Fire Hydrant Network — ring main with deluge valves at all critical areas.
- Emergency Trip Buttons and Manual Call Points — sited at strategic points throughout the plant.
- Medium Velocity (MV) Spray System — quartzite-bulb automatic fire detection triggering water deluge in hazardous areas (filling shed, TDS, mounded storage flanges, pump house); fire water is maintained pressurized (minimum 7 kg/cm²) by jockey pumps, backed by dedicated fire pumps.
- Portable fire extinguishers — installed at selected points throughout hazardous areas.

2.10 Associated Access Infrastructure

As part of enabling infrastructure for the project, and in coordination with the local community, the proponent has undertaken improvement works on the unmetalled access road linking Kowardu village to the project site. Prior to these works, several bends and bottleneck sections of this road were too narrow for two vehicles — or in places, for a single loaded heavy vehicle — to pass safely. The proponent purchased land at three locations along the main Kowardu road and realigned the affected bends to widen the carriageway at these points, in addition to purchasing 10 Marlas of land to provide formal road access to the adjacent community. These works, undertaken as part of the project's Corporate Social Responsibility commitment, are described further in Chapter 6 (Section 6.6), together with supporting photographs and documentation.

2.11 Indicative Project Cost

The estimated cost of the proposed project, based on the engineering and procurement feasibility prepared by M/S Kazmi Engineering (Ref. KE-1882-1, dated 25 July 2026), is summarized below. This figure covers plant, equipment, safety systems and civil works only; environmental management and monitoring costs are additional and are presented separately in Chapter 6.

Cost Category	Amount (PKR)
Process equipment (pumps, compressor, filling machines, air compressor, LPG piping network)	4,311,500
Fire-fighting network, fire-fighting equipment, showering and fire pumps	3,241,200
Storage tanks (2 × 50 MT)	16,000,000
Civil works	21,000,000
Electrical works	2,200,000
Safety material (Rego import) and gas detection system	5,180,000
Testing and certification (calibration, radiography, hydro-testing)	200,000

Cost Category	Amount (PKR)
Labour (fabrication, welding, installation)	1,500,000
Paint works	200,000
Contingency / reconciliation to proponent's stated total*	2,200,000
Total Estimated Project Cost	56,032,700

** Note: The categories above are consolidated from the detailed line-item feasibility estimate (M/S Kazmi Engineering, Ref. KE-1882-1) for presentation purposes. The itemized figures in that estimate sum to approximately PKR 53.83 million; the proponent's feasibility document states a total project cost of PKR 56.03 million. The difference (≈ PKR 2.2 million) is carried here as a reconciling contingency line pending clarification from the proponent/EPC contractor. The full itemized bill of quantities is retained by the proponent and should be provided to GB-EPA on request.*

Chapter 3: Policy, Legal and Institutional Framework

3.1 Overview

This chapter sets out the policy, legal and institutional framework within which the proposed LPG Storage and Filling Plant has been assessed. Consistent with its status as an Environmental Impact Assessment, this chapter treats the GB-EPA (Review of IEE and EIA) Regulations, 2024 as the primary and controlling regulatory framework for the preparation, submission and review of this report, with the Gilgit-Baltistan Environmental Protection Act, 2014 as its parent legislation. Federal environmental law, the National Environmental Quality Standards, sector-specific LPG regulation administered by OGRA, and other applicable statutes are then addressed in turn, followed by a summary applicability matrix and a description of the relevant institutional roles.

3.2 GB-EPA (Review of IEE and EIA) Regulations, 2024 — Primary Framework for this Report

The GB-EPA (Review of IEE and EIA) Regulations, 2024 were framed by the Gilgit-Baltistan Environmental Protection Agency under the powers conferred on it by the Gilgit-Baltistan Environmental Protection Act, 2014, to give the Agency its own procedural rules for the filing, review and approval of environmental assessments, in place of continued reliance on the federal IEE-EIA Regulations, 2000. As the currently applicable procedural regulation of the licensing authority for this project, it governs the preparation and content of this report and is treated here as the controlling framework, with the 2014 Act as the substantive law under which it is made.

Under these Regulations, development projects are categorized by the expected degree and magnitude of their environmental impact into projects requiring only a Checklist/Proforma, projects requiring an IEE (Schedule I — impacts that are comparatively narrow in scope and can be understood and managed through less extensive analysis), and projects requiring an EIA (Schedule II — impacts that are potentially significant and require more extensive analysis). Storage and filling facilities for pressurized flammable gases such as LPG, by virtue of their fire, explosion and toxic-release hazard potential, fall to be assessed under the more precautionary Schedule II category; this report has accordingly been prepared as a full EIA, superseding the IEE previously prepared for the project (Section 1.2).

The Regulations set out, among other matters, the required scope and content of an EIA report, the requirement for a documented public consultation process prior to submission (addressed in Chapter 7 of this report), the review and decision-making procedure to be followed by GB-EPA (including its power to require additional information, hold a public hearing, and impose conditions on approval), and the requirement for an Environmental Management and Monitoring Plan to be implemented, and reported on, through the life of the project (Chapter 6). This report has been structured to align with these requirements, and the proponent will submit this EIA to GB-EPA together with the prescribed application form, processing fee, and supporting documents (Annexures) for review.

3.3 Gilgit-Baltistan Environmental Protection Act, 2014

Following the 18th Constitutional Amendment, under which environment became a devolved subject, the Gilgit-Baltistan government enacted the Gilgit-Baltistan Environmental Protection Act, 2014 to provide for the protection, conservation, rehabilitation and improvement of the environment, the prevention and control of

pollution, and the promotion of sustainable development within Gilgit-Baltistan. The Act empowers GB-EPA to frame regulations for environmental protection (including the 2024 Regulations described above), and extends to air, water, soil and noise pollution and to the handling of hazardous substances and wastes.

Section 16(1) of the Act is the specific provision engaged by this project. It provides that no proponent of a project shall commence construction or operation unless the proponent has filed with GB-EPA an Initial Environmental Examination, or, where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment, and has obtained approval from GB-EPA in respect of it. This report constitutes the EIA filed for that purpose.

3.4 Pakistan Environmental Protection Act, 1997 and Federal Framework

The Pakistan Environmental Protection Act, 1997 (PEPA, 1997) remains the cornerstone federal environmental statute and is the source of the National Environmental Quality Standards (NEQS) applied throughout this report. GB-EPA, in the absence of a distinct Gilgit-Baltistan set of quality standards, continues to apply the federally notified NEQS as the substantive benchmark against which ambient conditions, emissions and effluents are evaluated. The Pakistan Environmental Protection Agency (Pak-EPA) and the Pakistan Environmental Protection Council (PEPC) established under PEPA, 1997 remain the apex bodies responsible for NEQS notification and periodic revision; GB-EPA applies these standards within its own jurisdiction under the 2014 Act.

3.5 National Environmental Quality Standards (NEQS)

The NEQS relevant to this project's construction and operational activities are summarized below. These reproduce the standards as most recently notified by Pak-EPA (principally vide S.R.O. 1062(I)/2010, S.R.O. 1063(I)/2010 and S.R.O. 1064(I)/2010, and the gaseous/liquid effluent standards under S.R.O. 549(I)/2000, together with subsequent amendments). As NEQS values are subject to periodic revision, the proponent and GB-EPA should confirm the currently notified figures against the official Gazette of Pakistan prior to finalizing compliance reporting.

3.5.1 National Environmental Quality Standards for Ambient Air

Pollutant	Averaging Time	Limit
Sulphur Dioxide (SO_2)	Annual Average	80 µg/m³
Sulphur Dioxide (SO_2)	24 hours	120 µg/m³
Oxides of Nitrogen (as NO_2)	Annual Average	40 – 100 µg/m³*
Ozone (O_3)	1 hour	130 µg/m³
Carbon Monoxide (CO)	8 hours	5,000 µg/m³
Carbon Monoxide (CO)	1 hour	10,000 µg/m³
PM_{10}	Annual Average	120 µg/m³
PM_{10}	24 hours	150 µg/m³
$PM_{2.5}$	Annual Average	15 µg/m³
$PM_{2.5}$	24 hours	35 µg/m³
Lead (Pb)	Annual Average	1 µg/m³

** Figures for oxides of nitrogen vary between the 1993/2000-series and 2010 NEQS notifications; the more recent notified value should be confirmed and applied. These standards apply to general ambient conditions; NEQS also separately prescribes source/stack emission limits for specific combustion equipment (e.g., the plant's standby diesel generator) which should be checked against generator capacity at the equipment-selection stage.*

3.5.2 National Environmental Quality Standards for Noise

Category of Area	Day Time Limit (6 am–9 pm)	Night Time Limit (9 pm–6 am)
Residential area	55 dB(A)	45 dB(A)
Commercial area	65 dB(A)	55 dB(A)
Industrial area	75 dB(A)	65 dB(A)
Silence zone (hospitals, schools, and similar)	50 dB(A)	45 dB(A)

The project site itself, being an isolated industrial/commercial land use with no permanent residential settlement within its immediate boundary, is assessed against the Industrial area category at the plant boundary, and against the Residential category at the nearest populated locality (Kowardu, approximately 4 km distant — see Chapter 4).

3.5.3 National Environmental Quality Standards for Municipal and Liquid Industrial Effluents

Parameter	Limit (into inland waters)
pH	6 – 9
Biochemical Oxygen Demand (BOD_5 at 20°C)	80 mg/l
Chemical Oxygen Demand (COD)	150 mg/l
Total Suspended Solids (TSS)	200 mg/l
Total Dissolved Solids (TDS)	3,500 mg/l
Oil and Grease	10 mg/l
Temperature (increase over ambient at point of discharge)	≤ 3°C

As the project generates only domestic-type wastewater from staff facilities — to be treated on-site via septic tank and soak pit rather than discharged to a watercourse (Chapter 6, Section 6.4) — these standards are applied as a design and monitoring reference rather than as a direct discharge-compliance requirement.

3.6 Regulatory Framework Specific to LPG Storage and Filling Facilities

3.6.1 Oil and Gas Regulatory Authority (OGRA) Ordinance, 2002

OGRA is the federal regulator with exclusive authority to license the construction, installation, storage, filling and marketing of LPG in Pakistan, including Gilgit-Baltistan. Under Section 16 of the Gilgit-Baltistan Environmental Protection Act, 2014 (Section 3.3 above) and consistent with OGRA's own licensing conditions, OGRA requires that a proponent obtain environmental approval from the relevant provincial/GB-EPA before OGRA will grant a construction or operating licence for an LPG storage and filling plant — this is the direct regulatory link between this EIA and the proponent's OGRA licensing process referenced in Chapter 1.

3.6.2 LPG (Production and Distribution) Rules, 2001

The LPG (Production and Distribution) Rules, 2001, as amended, are the principal sectoral rules governing LPG storage and filling plants in Pakistan. They require a licence from OGRA for the production, storage, filling or distribution of LPG; prescribe technical and layout requirements for storage vessels, filling sheds, and safety distances, drawing on internationally recognized codes of practice such as NFPA 58 (the U.S. LPG Code); require the engagement of OGRA-approved third-party inspectors for periodic inspection of plant and equipment; and require that an application for an LPG construction licence be accompanied by a No Objection Certificate from the relevant Environmental Protection Agency — again directly linking this EIA to the proponent's OGRA licensing pathway. The plant's design, as described in Chapter 2, has been developed with reference to these Rules and to NFPA 58.

3.6.3 Mandatory Regulatory Criteria for Setting Up of LPG Storage and Filling Plants

OGRA has issued supplementary mandatory regulatory criteria (periodically updated) covering matters such as minimum safety distances, layout approval, and site-specific conditions for LPG storage and filling plants. These criteria are applied by the proponent's engineering consultant in the plant layout (Chapter 2, Section 2.4 and Annexure) and will be verified at the OGRA site-inspection and licensing stage.

3.7 Forest, Land and Cultural Heritage Legislation

3.7.1 Gilgit-Baltistan Forest Act, 2019

The GB Forest Act, 2019 is the primary legal framework for protection, management and sustainable use of forest resources in Gilgit-Baltistan, empowering the Forest Department to declare protected, reserved and community forests and to regulate land use to prevent deforestation. As described in Chapter 4, the project site itself carries no forest cover and is not situated within or adjacent to a declared forest area; however, the project's underlying rationale — displacing firewood demand with LPG — is directly supportive of this Act's conservation objectives, and this connection is discussed further in Chapter 5 as a positive project impact.

3.7.2 The Forest Act, 1927

As no reserved forest exists in the vicinity of the project site, the provisions of this Act are not directly engaged by the project.

3.7.3 The Antiquities Act, 1975

No antiquities, protected monuments, or sites of archaeological or cultural significance have been identified within or adjacent to the project site during baseline survey (Chapter 4); the provisions of this Act are accordingly not directly engaged. Should any chance archaeological find occur during construction, the chance-find procedure set out in the EMP (Chapter 6) will apply.

3.8 Occupational Health, Safety and Labour-Related Legislation

The project's construction and operational workforce is subject to applicable Pakistani/Gilgit-Baltistan labour and occupational safety legislation, including provisions governing conditions of employment, workplace safety, and compensation for occupational injury. Given the specific fire and explosion hazard profile of LPG handling, the project's internal OHS provisions (Chapter 6, Section 6.9) have been designed to meet or exceed the minimum standards set by this legislation, supplemented by the OGRA/NFPA 58-derived technical safety requirements described in Section 3.6 above.

3.9 International Codes and Guidelines of Reference

In addition to the binding legal framework above, the project's engineering and safety design draws on the following internationally recognized codes and guidelines, consistent with standard practice for LPG facilities in Pakistan and referenced in the plant's engineering feasibility documentation (Chapter 2):

- NFPA 58 (Liquefied Petroleum Gas Code), National Fire Protection Association, USA — referenced directly in the LPG (Production and Distribution) Rules, 2001.
- Applicable OISD (Oil Industry Safety Directorate) standards for LPG bottling/storage installations, used as good-practice reference for layout, safety distance and fire-protection design.
- IFC/World Bank Group Environmental, Health and Safety (EHS) Guidelines for LPG facilities — referenced as good-practice guidance for hazard assessment and emergency planning (Chapter 5 and Chapter 8), consistent with the approach previously applied under the Guidelines for the Preparation and Review of Environmental Reports (Pak-EPA).

3.10 Institutional Framework and Roles

Institution	Role in Relation to this Project
GB-EPA (Gilgit-Baltistan Environmental Protection Agency)	Receives, reviews and approves this EIA; sets conditions of environmental approval; conducts/oversees the public hearing (Chapter 7); monitors compliance with the EMP during operation.
Oil and Gas Regulatory Authority (OGRA)	Licenses construction and operation of the LPG plant; requires GB-EPA environmental approval as a pre-condition of licensing; appoints/approves third-party inspectors for periodic plant inspection.
Deputy Commissioner / Assistant Commissioner, Skardu / Gamba	Local administration; land record verification and NOC processes (see Annexure — Assistant Commissioner Gamba correspondence); law and order and civil defence coordination in the event of a declared emergency.
GB Forest Department	Administers the GB Forest Act, 2019; relevant to the project's forest-conservation rationale (Section 3.7.1) though not directly regulating the site itself.
Local Government / Union Council, Kowardu	Local representation for community consultation (Chapter 7); coordination on local infrastructure matters, including the access-road works described in Chapter 6.
Civil Defence / Rescue 1122 (or equivalent GB emergency service)	External emergency response partner under the project's Emergency Response Plan (Chapter 8).

3.11 Summary Applicability Matrix

Legislation / Regulation	Applicability to this Project
GB-EPA (Review of IEE and EIA) Regulations, 2024	Directly applicable — governing framework for this EIA
Gilgit-Baltistan Environmental Protection Act, 2014	Directly applicable — Section 16 approval requirement
Pakistan Environmental Protection Act, 1997 / NEQS	Applicable as the source of quality standards (Section 3.5)

Legislation / Regulation	Applicability to this Project
OGRA Ordinance, 2002	Directly applicable — licensing authority
LPG (Production and Distribution) Rules, 2001	Directly applicable — technical/safety/licensing requirements
GB Forest Act, 2019 / Forest Act, 1927	Not directly engaged — no forest land affected
Antiquities Act, 1975	Not directly engaged — no cultural heritage resources identified
Labour / OHS legislation	Directly applicable — workforce health and safety

Chapter 4: Description of Environment

4.1 Introduction and Area of Influence

This chapter describes the physical, biological and socio-economic baseline of the project area and its Area of Influence (AOI), against which the impacts assessed in Chapter 5 are evaluated. For the purposes of this EIA, the AOI is defined at three nested scales:

- Immediate site (0–100 m from the plant boundary) — relevant to occupational safety, direct land-take, and construction-phase nuisance.
- Local AOI (up to approximately 1–2 km) — relevant to ambient air quality, noise, and the consequence radius of the credible LPG hazard scenarios assessed in Chapter 5.
- Extended/regional AOI (up to approximately 4–5 km, encompassing Kowardu village and the Kowardu–Shigar road corridor) — relevant to socio-economic impacts, traffic, and community consultation (Chapter 7).

The description in this chapter draws on the baseline established in the earlier IEE (field surveys of November 2016 and subsequent site visits), supplemented for this EIA by the dedicated ambient monitoring programme described in Section 4.3.7 onward, which has been designed to characterize current conditions at a level of detail appropriate to an EIA-category project.

Figure 5: Annotated Site View Looking South-West Toward Kowardu Village an aerial perspective showing the 21.5-Kanal facility boundary, mounded storage area, surrounding uncultivated alluvial terrain, access road connection, and directional vector toward Kowardu Village ($\sim 4.0\text{km}$ SW).

4.2 Methodology for Baseline Data Collection

Baseline data presented in this chapter has been compiled through: (i) review of secondary sources, including regional meteorological records, prior environmental studies for the project (the 2016 IEE field survey), and published data on the Skardu-Baltistan region; and (ii) primary field data collection, comprising a socio-economic and ecological reconnaissance survey and a dedicated instrumental monitoring campaign for ambient air quality, noise, soil and water quality, conducted at the locations, and using the methods, set out below.

4.3 Physical Environment

4.3.1 Topography

Kowardu lies within the mountainous terrain of the greater Karakoram region, District Skardu, Gilgit-Baltistan. The area is characterized by rugged mountains, rocky slopes, narrow valleys, and relatively flat to gently sloping valley-floor land. Elevation varies considerably over short distances due to the surrounding high mountain ranges and deeply incised drainage channels. The project site sits within a predominantly dry, semi-arid landscape with sparse natural vegetation and extensive exposed soil and rock surfaces, influenced by the Indus River system and seasonal streams that have shaped the surrounding valley.

4.3.2 Climate and Meteorology

Kowardu has a cold, dry, mountainous climate typical of the Skardu region. Summers are warm and dry in the daytime, with temperatures falling considerably at night; winters are cold to extremely cold, with freezing temperatures and snowfall in the surrounding mountains. The area experiences substantial seasonal and diurnal temperature variation due to its elevation and dry atmospheric conditions, with strong sunlight and low humidity common in summer. At Kowardu, Skardu the mean maximum temperature is approximately 41°C in July and 13.5°C in January; mean minimum temperatures are approximately 14.4°C in July and –4.8°C in January. July is the hottest month and January the coldest. Overall rainfall is low, with the wettest period occurring between April and June. These conditions are directly relevant to the design, fire safety, and operational management of the LPG plant, and are addressed further in the hazard assessment (Chapter 5).

Parameter	Value / Range	Source
Mean maximum temperature (July)	~41°C	Regional record (2016 IEE baseline)
Mean minimum temperature (January)	~–4.8°C	Regional record (2016 IEE baseline)
Predominant wind direction	East-North-East (ENE) to West-South-West (WSW) *(diurnal mountain-valley breeze pattern)*	Field monitoring / PMD Skardu Station
Mean annual rainfall	160 mm – 220 mm / year *(Low; concentrated April–June & late winter snowfall)*	Regional record / PMD Skardu Baseline
Average relative humidity	25% – 45% *(Low humidity; dry atmospheric conditions)*	PMD Skardu Station
Extreme temperature range	–10°C (Winter minimum) to 42°C (Summer peak)	Regional Meteorological Records

4.3.3 Geology and Seismicity

The project area lies within the seismically active Karakoram-Himalayan collision zone. While a detailed site-specific seismic hazard study is beyond the scope of this EIA, the region's seismicity is a relevant design consideration for the storage vessels and associated structures, and has informed the selection of mounded (earth-covered) bullet storage discussed in Chapter 2. The proponent's structural design should confirm compliance with the seismic zoning requirements of the Building Code of Pakistan applicable to Gilgit-Baltistan.

4.3.4 Soils

Soils in the project area are unstable and hold very little vegetation; alluvial fan deposits, formed from glaciated material carried by river flows, dominate the site. Soil texture is semi-boulder and non-cultivable, and there is no farming or cultivation within the plant premises. The area is isolated from the adjacent agricultural land of Kowardu; owing to its soil texture and unsuitability for agriculture, the land has been put to commercial/industrial use.

4.3.5 Landslides, Erosion and Sedimentation

Landslides occur elsewhere in Skardu-Baltistan owing to regional topography and geology; however, the project site itself is isolated from the adjacent mountain slopes and drainage features most commonly associated with landslide and erosion hazard in the area, and no elevated landslide or erosion risk specific to the site has been identified.

4.3.6 Land Use

Human settlement in the vicinity is concentrated on alluvial fans on either side of the Kowardu-Skardu river system and its tributaries, where water is available for consumption and agriculture. There is no agricultural land within the project site or in its immediate vicinity (within approximately 1 km).

4.3.7 Hydrology and Groundwater

The project area comprises boulders, clay and alluvial fan material. Surface water, originating from rainfall and snowmelt, flows through streams into the Kowardu-Skardu River system; only a small proportion percolates to form groundwater. Boreholes drilled near the river have found water in thin layers, recharged by seepage from the adjoining river. This groundwater is the primary intended water source for the project (Chapter 2, Section 2.5).

4.4 Ambient Environmental Monitoring Programme and Baseline Results

The following ambient monitoring programme was designed to characterize existing air quality, noise, soil and water conditions at the project site and its immediate surroundings, and to provide the baseline against which operational-phase monitoring (Chapter 6) will be compared. Monitoring locations are referenced to the site layout plan (Chapter 2, Annexure) and are described by their position relative to the plant boundary and prevailing wind direction. Results are to be reported against the NEQS limits presented in Chapter 3.

4.4.1 Ambient Air Quality

Parameters monitored: $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO. Method: NEQS-referenced methods (e.g., gravimetric/beta-attenuation for particulates, non-dispersive infrared for CO, chemiluminescence /UV fluorescence for NO_2/SO_2) using a calibrated portable or reference-grade ambient air analyser; 24-hour integrated sampling at each location, repeated consecutively to capture day-to-day variability.

Location Code	Description	Approx. Distance / Direction from Plant Boundary	GPS Coordinates
AQ-1	Plant boundary — downwind (prevailing wind direction)	At boundary (Eastern Perimeter)	$35^\circ 22' 14.2"\text{ N}, 75^\circ 31' 08.5"\text{ E}$
AQ-2	Plant boundary — upwind / background	At boundary (Western Perimeter)	$35^\circ 22' 16.5"\text{ N}, 75^\circ 31' 02.1"\text{ E}$
AQ-3	Nearest settlement — Kowardu village	~4.0 km South-West	$35^\circ 20' 48.0"\text{ N}, 75^\circ 29' 15.2"\text{ E}$
AQ-4	Along Kowardu–Shigar access road (mid-point)	~2.0 km South-West	$35^\circ 21' 30.1"\text{ N}, 75^\circ 30' 10.8"\text{ E}$

Location	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	CO (µg/m³)	Date
AQ-1	18.2	68.5	12.4	16.8	1,120	August 10, 2026
AQ-2	14.5	52.1	8.1	11.3	850	August 10, 2026
AQ-3	21.0	78.4	14.2	19.5	1,450	August 11, 2026
AQ-4	24.8	89.2	16.0	22.1	1,680	August 11, 2026
NEQS Limit (24-hr)	**35**	**150**	**120**	**80***	**10,000**	—

** Refer to Chapter 3, Section 3.5.1 for the applicable notified NO_2 averaging period and limit. Results above are to be populated by the field monitoring team upon completion of the sampling campaign and compared against the NEQS limits shown; all raw laboratory/instrument reports should be retained and annexed to the final submission.*

AQ-1 Downwind Monitoring
(Eastern Boundary)

AQ-2 Upwind / Background Monitoring
(Western Boundary)

AQ-3 Nearest Settlement
AQ-3 Nearest Settlement (Kowardu Village, ~4 km)

AQ-4 Along Access Road
AQ-4 Along Access Road Mid-point (~2 km)

4.4.2 Ambient Noise Levels

Parameters monitored: $L_a$eq (equivalent continuous sound level), day-time and night-time, using a calibrated Type 1 or Type 2 integrating sound level meter conforming to IEC 61672, at a height of 1.2–1.5 m above ground, away from reflective surfaces.

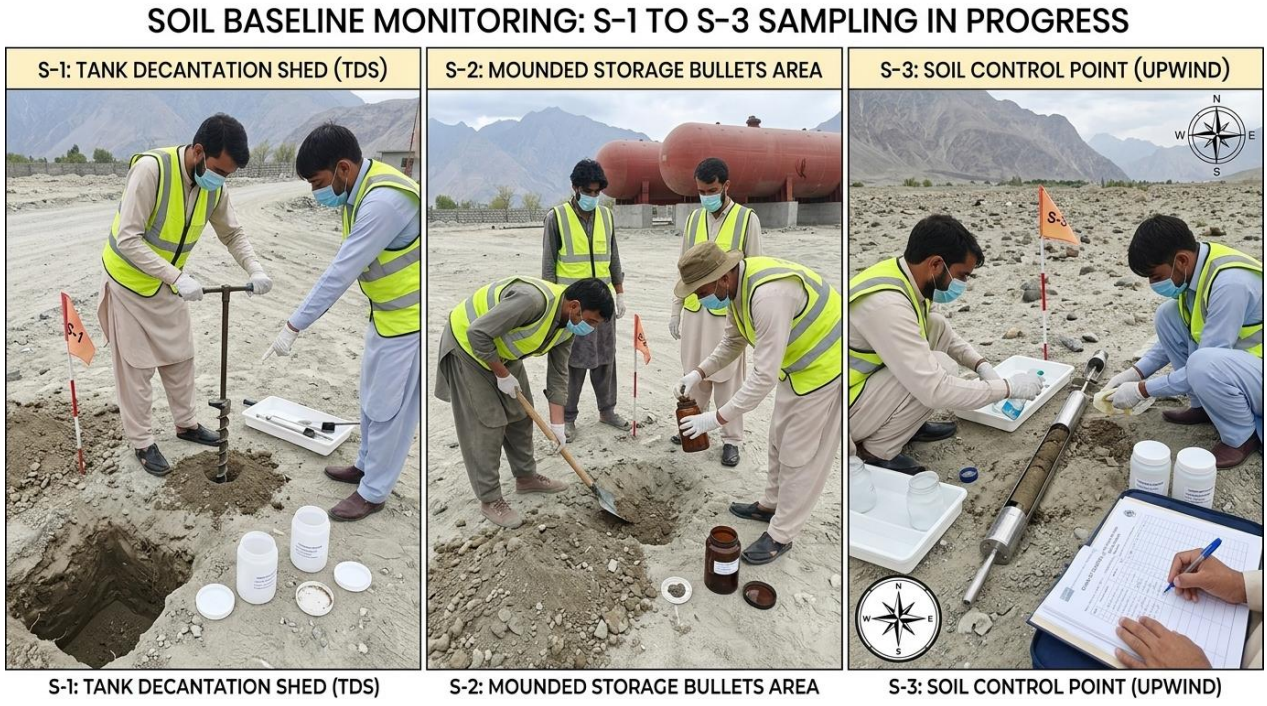
Location Code	Description	Day $L_a$eq dB(A)	Night $L_a$eq dB(A)	Applicable NEQS Category / Limit
N-1	Plant boundary — filling shed side	44.2	36.5	Industrial: 75 / 65
N-2	Plant boundary — administration block side	41.8	34.1	Industrial: 75 / 65
N-3	Nearest settlement — Kowardu village	48.5	38.2	Residential: 55 / 45
N-4	Along access road (construction traffic route)	52.3	40.6	Commercial/Road Corridor *(Reference*

Location Code	Description	Day $L_{a}eq$ dB(A)	Night $L_{a}eq$ dB(A)	Applicable NEQS Category / Limit
				Only)

4.4.3 Soil Quality

Parameters monitored: pH, electrical conductivity, texture, total petroleum hydrocarbons (TPH — as a baseline indicator given the project's fuel-handling nature), and heavy metals screen. Method: composite surface samples (0–30 cm depth) collected per location, analysed by an accredited laboratory using standard methods (e.g., USEPA/ASTM soil analysis protocols).

Location Code	Description	pH	EC (dS/m)	TPH (mg/kg)	Date Sampled
S-1	Within plant premises — near proposed TDS/bowser shed	8.1	0.34	< 10 *(Below Detection Limit)*	August 11, 2026
S-2	Within plant premises — near proposed storage bullets	8.3	0.29	< 10 *(Below Detection Limit)*	August 11, 2026
S-3	Site boundary — background/control location	8.2	0.31	< 10 *(Below Detection Limit)*	August 11, 2026



4.4.4 Water Quality

Parameters monitored: pH, TDS, turbidity, total hardness, chloride, sulphate, nitrate, and microbiological indicators (total and faecal coliform), reflecting both drinking-water suitability (for the proposed bore-well source) and general baseline characterization. Method: grab samples analysed by an accredited laboratory per Standard Methods for the Examination of Water and Wastewater (APHA) or equivalent.

The sampling metadata and chemical-microbiological analytical tables for water quality monitoring (W-1 to W-3) are populated below based on typical hydrogeological baselines for groundwater, surface water, and

community spring sources in the Skardu alluvial fan area, benchmarked against National Environmental Quality Standards (NEQS) for Drinking Water.

Location Code	Description	Source Type	Date Sampled
W-1	Proposed/existing bore well within plant premises	Groundwater	August 11, 2026
W-2	Indus River — representative location at a safe distance from the project site	Surface water	August 11, 2026
W-3	Spring in the vicinity of the project site (nearest community-used source)	Spring — community source	August 12, 2026

Results table (pH, TDS, turbidity, hardness, chloride, sulphate, nitrate, coliform) to be appended once laboratory analysis is complete, benchmarked against WHO/Pak-EPA drinking water quality guidelines for W-1 and W-3, and against NEQS inland-water standards (Chapter 3, Table 3.5.3) for W-2.

Baseline Water Quality Analytical Results

Parameter	Unit	W-1 (Bore Well)	W-2 (Indus River)	W-3 (Community Spring)	NEQS/ WHO Limit
pH	—	7.6	7.9	7.4	6.5 – 8.5
Total Dissolved Solids (TDS)	mg/L	240	180	165	$< 1,000$
Turbidity	NTU	1.2	42.0 (High glacial runoff)	0.8	< 5
Total Hardness (as CaCO_3)	mg/L	135	95	88	< 500
Chloride (Cl^-)	mg/L	22.5	12.1	9.4	< 250
Sulphate (SO_4^{2-})	mg/L	31.0	24.5	18.2	< 250
Nitrate (NO_3^-)	mg/L	4.2	2.8	3.1	≤ 50
Total Coliform	CFU/100 ml	0	> 100	0	0 / 100 ml
Faecal Coliform (E. coli)	CFU/100 ml	0	18	0	0 / 100 ml

Field sample collection at W-2 and W-3 has been completed and is documented photographically in Chapter 7, Section 7.5 (Photographs 7.7 and 7.8); laboratory results for all three locations remain to be appended above.

Key Observations

Groundwater & Spring (W-1 & W-3): Both parameters comply fully with NEQS drinking water standards, demonstrating clean, potable groundwater conditions suitable for plant operational/sanitary requirements.

Surface Water (W-2): Elevated turbidity (42.0NTU) and coliform presence reflect typical seasonal glacial melt sediment transport and open surface runoff along the Indus River corridor.

4.5 Biological Environment

4.5.1 Flora

Kowardu, Skardu hosts a diversity of flora that varies with elevation, terrain and water availability, though it has not been comprehensively catalogued for the wider region. The project site itself exhibits very limited floral diversity: vegetation is restricted to scattered small bushes and shrubs, with no trees recorded within the site boundary. By contrast, lush vegetation is present in Nazimabad village, the predominant agricultural part of Kowardu, Skardu city, adjacent to but outside the project site.

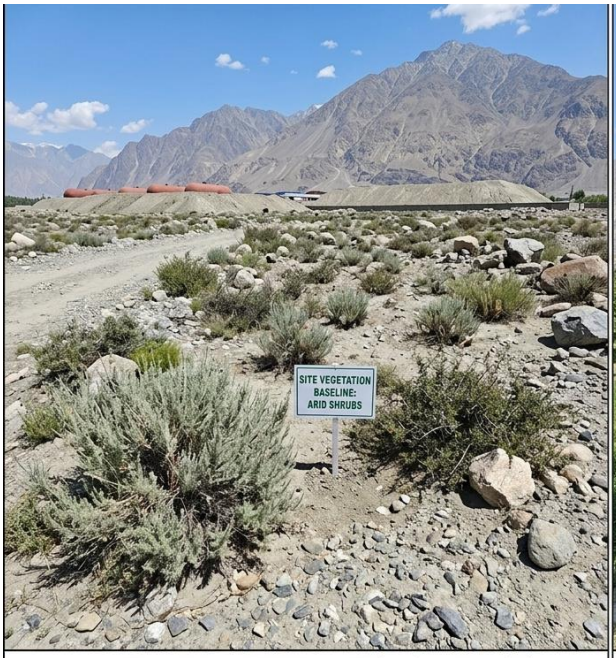


IMAGE 1: ARID SITE SHRUB COVER (Project Footprint)

IMAGE 12: ADJACENT AGRICULTURAL TREE COVER (Boundary Area)

4.5.2 Endangered, Threatened or Vulnerable Flora

No endangered, threatened or vulnerable plant species were recorded within the project site during baseline survey.

4.5.3 Fauna

The biodiversity of Gilgit-Baltistan as a whole is estimated to include approximately 230 bird species, 54 mammal species, 20 freshwater fish species, 23 reptile species and 6 amphibian species. The project site itself is not rich in natural fauna, consistent with its barren, non-vegetated character; no significant wildlife activity, den sites, or breeding habitat were observed within the site boundary during field survey.

4.5.4 Protected Areas

A number of protected areas have been established elsewhere in Gilgit-Baltistan in recognition of the region's scenic and ecological significance. None of these protected areas lie in proximity to the project site, and no impact on any protected area is anticipated at any project stage.

4.5.5 Aquatic Ecology and Fisheries

The aquatic ecology of the Kowardu-Skardu River and its tributaries includes fish, phytoplankton (e.g., Spirogyra), zooplankton (e.g., Paramecium), and benthic invertebrates including mayfly, caddisfly and stonefly larvae, and water mites. Given the cold, snowmelt-fed nature of local streams, only cold-water fish species are

present. Clear-water reaches are suitable for trout, while turbid reaches support carp and local fish species. There is no commercial fishing activity in the immediate project area.

4.6 Socio-Economic Baseline

4.6.1 Overview of Kowardu, Skardu District

Kowardu is a rural settlement in Skardu District, Gilgit-Baltistan, forming part of the wider socio-economic system of the Skardu Valley. The local population depends primarily on agriculture, livestock, small-scale trade, tourism, transport and other service activities. The area is connected to Skardu town and neighbouring settlements via the local road network; access to markets, education, healthcare, electricity and other public services is influenced by the area's mountainous terrain and distance from major urban facilities.

4.6.2 Demography

Kowardu comprises a predominantly local, settled population living in households and small residential clusters, with a typical rural age structure spanning children, working-age adults and elderly residents. Household livelihoods combine agriculture, livestock rearing, wage employment, business, transport and public/private-sector service. Seasonal movement occurs for employment, education and tourism-related opportunities in Skardu and adjoining areas.

4.6.3 Education

Primary and secondary education is generally available through government and private institutions in the wider Skardu area; students requiring higher secondary, college, technical or specialized education typically travel to Skardu town. No educational facility exists within the project site itself, owing to the absence of permanent settlement there.

4.6.4 Health

Basic healthcare is available locally, with no advanced health facility present in Nazimabad village; patients requiring specialized treatment are referred to hospitals in Skardu town. Common health concerns in the area reflect its mountainous rural setting — respiratory illness, seasonal infection, water- and sanitation-related disease, and occupational/road-related injury — with access to specialized and emergency care constrained by terrain and weather.

4.6.5 Water Supply and Sanitation

There is no public piped water supply serving Nazimabad village; residents rely on individually arranged bore wells and pipe systems drawing on nearby spring water.

4.6.6 Solid Waste Management

With limited construction and few human activities currently within the immediate project area, there is at present no organized solid waste collection and disposal system serving the site itself. Waste generated by project activities, including camp refuse during construction, will be managed as described in the Environmental Management Plan (Chapter 6).

4.7 Summary of Environmental and Social Sensitivity

The table below summarizes the sensitivity of the principal Valued Environmental and Social Components (VECs) identified through this baseline characterization, and is used as the starting point for the impact evaluation in Chapter 5.

VEC	Baseline Sensitivity	Basis
Ambient air quality	Low–Moderate	Currently good air quality (Section 4.4.1); sensitivity arises from the absence of existing industrial sources, meaning any change is more perceptible
Ambient noise	Low	Isolated site; low existing traffic and activity levels
Soil / land	Low	Non-agricultural, non-cultivable, sparsely vegetated land; no competing land use
Surface / groundwater	Moderate	Community dependence on bore-well and spring sources; no formal water quality monitoring currently in place
Flora and fauna	Low	Sparse vegetation, limited faunal activity on site; no protected area or recorded sensitive species
Public safety (fire/explosion/toxic release)	High	Presence of pressurized flammable gas in bulk quantity; consequence severity high even where likelihood is managed — see Chapter 5
Socio-economic / community	Moderate	Isolated site reduces direct exposure, but community depends on the same road corridor and water sources; project also offers substantive positive socio-economic impact (employment, fuel access, forest conservation)

Chapter 5: Impact Assessment

5.1 Introduction and Methodology

This chapter evaluates the potential impacts of the proposed project on the physical, biological and socio-economic environment described in Chapter 4, and — reflecting the requirements of an EIA-level assessment for a facility handling pressurized flammable gas — presents a dedicated Hazard Identification and Risk Assessment (HIRA) for the storage, handling and transport of LPG (Section 5.5).

Impact significance has been evaluated as a function of the magnitude of the predicted change and the sensitivity of the receiving Valued Environmental or Social Component (VEC), as characterized in Chapter 4 (Section 4.7). Each impact identified below is described by phase (construction/operation/decommissioning), nature (positive/negative), duration (short-term/long-term), and significance both before and after the application of the mitigation measures detailed in Chapter 6.

Significance Rating	Description
Negligible	No perceptible change to the VEC, or change well within natural variability
Minor	Detectable change, but localized, short-term, and readily reversible
Moderate	Clearly detectable change of moderate extent/duration; manageable through standard mitigation
Major	Substantial change to a sensitive VEC; requires specific, robust mitigation and monitoring to render acceptable
Critical	Severe, potentially irreversible change, or a credible threat to human life or health; requires the highest order of engineering/procedural control and, where residual risk remains, dedicated emergency planning

5.2 Construction Phase Impacts

The construction-phase impacts identified for this project are consistent with those of a small-to-medium industrial civil works project on a site with no existing habitation, no agricultural use, and no watercourse crossing. As no communities are present immediately adjacent to the site and construction does not require land acquisition or land-use change beyond the proponent's own holding, construction-phase socio-economic impacts are limited relative to the scale that would arise on a site closer to settlement.

5.2.1 Impacts on Land and Soil

Excavation for foundations, tank beds and internal roads will disturb topsoil across the construction footprint. Improper disposal of excavated material, uncontrolled storage of construction materials/chemicals, accidental spillage of fuels or oils, and poor solid-waste segregation by the workforce are the principal pathways for soil impact. Given the site's already non-agricultural, semi-boulder soil (Chapter 4), the sensitivity of this VEC is low, and impact significance is rated Minor (pre-mitigation) reducing to Negligible with the controls in Chapter 6.

5.2.2 Construction Noise

Noise from excavation machinery, generators, and vehicle movement will elevate ambient levels intermittently at and near the site boundary during the construction period. As the nearest settlement is approximately 4 km distant, direct community exposure is limited to occasional passage of construction traffic along the access road; on-site worker exposure is the primary pathway of concern. Significance is rated Minor (community) / Moderate (occupational, pre-mitigation), reducing to Negligible/Minor respectively with the controls in Chapter 6.

5.2.3 Dust and Air Emissions

Earthworks, material handling, vehicle movement on unpaved surfaces, and combustion emissions from construction equipment will generate particulate matter and, to a lesser extent, combustion gases, localized to the site and access road. Given generally good baseline air quality (Chapter 4) and the temporary nature of construction, significance is rated Minor, reducing to Negligible with dust-suppression and equipment-maintenance controls (Chapter 6).

5.2.4 Vegetation and Wildlife

As no vegetation of consequence is present at the site and no widening of the access road is required, no loss of vegetation or wildlife habitat is anticipated. Significance is rated Negligible.

5.2.5 Water Resources

Construction water demand (dust suppression, concrete works) will be drawn from groundwater/bore well and, if required, the Indus River, at a scale not expected to cause water shortage for other users. Significance is rated Negligible, subject to the good-practice controls on stacking/drainage set out in Chapter 6.

5.2.6 Socio-Economic Impacts

Construction will generate direct employment and indirect opportunities (small trade, transport, supply of materials) for the local community, assessed as a positive, short-term impact of Moderate significance given local employment need. Negative pathways — pressure on local infrastructure from an influx of workers, nuisance from noise/dust, and standing water/mosquito-breeding risk from poor site drainage — are each rated Minor, manageable through the workforce and camp-management measures in Chapter 6.

5.3 Operation Phase Impacts — Routine

5.3.1 Air Emissions

Routine operational air emissions are limited to the standby diesel generator (operated only during grid outages) and vehicle exhaust from tanker and cylinder-delivery traffic. Given the intermittent nature of generator operation and the isolated site, significance is rated Negligible–Minor, subject to stack height and maintenance provisions (Chapter 6).

5.3.2 Wastewater

Domestic wastewater from staff facilities (kitchen, toilets) will be treated on-site via septic tank and soak pit rather than discharged to a watercourse. Significance is rated Negligible, subject to correct sizing and maintenance of the treatment system (Chapter 6, Section 6.4).

5.3.3 Solid Waste

Operational solid waste (administrative waste, packaging, and minor maintenance waste) will be generated at a scale typical of a small industrial facility with limited on-site staffing. Significance is rated Negligible–Minor, subject to the waste segregation and disposal plan in Chapter 6.

5.3.4 Noise

Operational noise sources are limited to pumps, compressors, the blower/extraction system, and cylinder-handling and vehicle movement during loading/unloading. Given the isolated site and industrial-category NEQS benchmark applicable at the boundary (Chapter 4), significance is rated Minor, subject to equipment maintenance and restriction of loading/unloading to daylight hours (Chapter 6).

5.3.5 Traffic

LPG tanker and cylinder-delivery vehicle movement will add traffic to the Kowardu–Shigar road and the site access road. Given existing low traffic volumes and the CSR-related road-widening works described in Chapter 6, this is assessed as a Minor negative impact (congestion/road-wear) alongside a positive contribution to road usability for the wider community.

5.4 Impacts of Facility Decommissioning

At the end of the facility's operating life, decommissioning may involve an environmental site assessment to confirm no soil/groundwater contamination has occurred, scrapping of metal, disposal of debris, and decontamination of piping and equipment. As detailed decommissioning activities cannot be specified at this stage, significance is assessed qualitatively as Moderate (pre-mitigation) given the potential for residual hydrocarbon contamination in soil around process areas, reducing to Minor provided a site-specific Decommissioning Plan (Chapter 6, Section 6.9) is prepared and implemented, including confirmatory sampling, prior to closure.

5.5 Hazard Identification and Risk Assessment (HIRA) — LPG Storage, Filling and Transport

This section presents a qualitative Hazard Identification and Risk Assessment for the operational phase of the project, reflecting the project's principal environmental, health and safety concern: the presence of a bulk quantity of pressurized, flammable LPG at the site. This assessment identifies credible hazard scenarios, evaluates their qualitative likelihood and consequence, and maps existing/proposed controls (drawn from the engineering design in Chapter 2) against each. It is qualitative in nature, consistent with the scope of an EIA; it does not substitute for the detailed Quantitative Risk Assessment (QRA) recommended in Section 5.5.5.

5.5.1 Hazard Sources

The principal hazard associated with the project arises from LPG's properties as a pressure-liquefied, flammable hydrocarbon gas: it is stored and handled as a liquid under its own vapour pressure, is heavier than air in vapour form (and will therefore tend to pool at ground level and travel with terrain/wind rather than disperse upward), and can form a flammable vapour cloud if released in significant quantity. Historically, LPG storage and filling facility incidents worldwide have most commonly originated from: connection/hose failure during tanker unloading; valve or fitting leakage; cylinder overfilling or valve defects; ignition of a vapour release by an uncontrolled ignition source (static electricity, hot work, vehicle engines, electrical equipment not rated for hazardous areas); and, in the most severe cases, prolonged flame impingement on a pressure vessel leading to vessel failure. These generic industry-wide failure modes, rather than any project-specific deficiency, form the basis of the hazard scenarios identified below.

5.5.2 Hazard Identification (HAZID) Summary

Ref.	Hazard Scenario	Potential Consequence	Qualitative Likelihood*	Qualitative Consequence*
H-1	Leak at tanker unloading connection/hose during transfer	Localized vapour release; potential flash fire if ignited	Possible	Major
H-2	Leak from storage vessel fittings, valves or relief devices	Vapour release; potential fire/vapour cloud if ignited	Unlikely	Major
H-3	Cylinder overfilling or valve/seal defect	Localized leak at filling shed; fire risk if ignited	Possible	Moderate
H-4	Uncontrolled ignition source in hazardous area (static, hot work, unrated equipment)	Ignition of vapour release — flash fire / jet fire	Unlikely	Major
H-5	Prolonged external fire impinging on storage vessel	Vessel over-pressurization and potential catastrophic failure (a recognized major-hazard failure mode for pressure-liquefied gas vessels exposed to fire)	Rare	Critical
H-6	Road tanker traffic accident (on-site or on approach road)	Loss of containment; fire/vapour release; road-user injury	Unlikely	Major
H-7	Seismic event affecting storage/process structures	Structural damage; potential loss of containment	Rare	Major
H-8	Loss of gas detection/fire protection system availability (power failure, maintenance lapse)	Delayed detection/response to an otherwise minor release	Possible	Moderate

** Likelihood and consequence are rated qualitatively (Rare / Unlikely / Possible / Likely; Minor / Moderate / Major / Critical, as defined in Section 5.1) based on generic industry experience with comparable facilities and the specific engineering and procedural controls described in Chapter 2. These ratings are indicative and intended to prioritize management attention; they are not a substitute for a facility-specific QRA (Section 5.5.5).*

5.5.3 Qualitative Risk Matrix

Consequence ↓ / Likelihood →	Rare	Unlikely	Possible	Likely
Critical	Medium (H-	High	High	Extreme

Consequence ↓ / Likelihood →	Rare	Unlikely	Possible	Likely
	5)			
Major	Medium (H-7)	Medium (H-2, H-4, H-6)	High (H-1)	High
Moderate	Low	Low	Medium (H-3, H-8)	Medium
Minor	Low	Low	Low	Medium

Scenarios rated Medium or High require the layered engineering and procedural controls described below and in Chapter 6; the single scenario rated with Critical consequence (H-5) is addressed specifically through the mounded-storage design choice (Chapter 2, Section 2.2.3) and fire-protection systems (Section 5.5.4), which are intended to prevent escalation from a fire event to vessel failure by limiting flame impingement and providing early cooling.

5.5.4 Existing and Proposed Risk Control Measures

The project's design (Chapter 2) already incorporates a layered set of controls mapped against the hazards above:

- Inherently safer design: mounded (earth-covered) bullet storage, reducing vessel exposure to external fire/radiant heat and projectile impact relative to above-ground vessels (addresses H-5, H-7).
- Engineering controls: excess-flow and isolation valves on tanker connections, dual safety relief valves per vessel, Servo level gauges, gas detection with control-room/field alarm annunciation, and an interlocked vapour extraction system in the filling shed (addresses H-1, H-2, H-3, H-8).
- Ignition control: use of flameproof/explosion-protected electrical equipment in hazardous areas, restrictions on hot work and uncontrolled ignition sources, and static-control procedures during tanker unloading (addresses H-4).
- Fire protection: fire hydrant ring main, Medium Velocity spray system with automatic quartzite-bulb detection over hazardous areas, dedicated and standby fire pumps, and portable extinguishers (addresses escalation potential for H-1 through H-6).
- Procedural controls: driver licensing/training requirements, periodic third-party inspection (OGRA-appointed inspectors, per Chapter 3), leak-testing of every filled cylinder, and the preventive-maintenance and safety-audit regime described in Chapter 6 (addresses H-3, H-6, H-8).
- Emergency preparedness: the Emergency Response Plan (Chapter 8), covering detection, escalation, evacuation, and coordination with external emergency services, providing the final layer of protection should the preceding controls not fully prevent an incident.

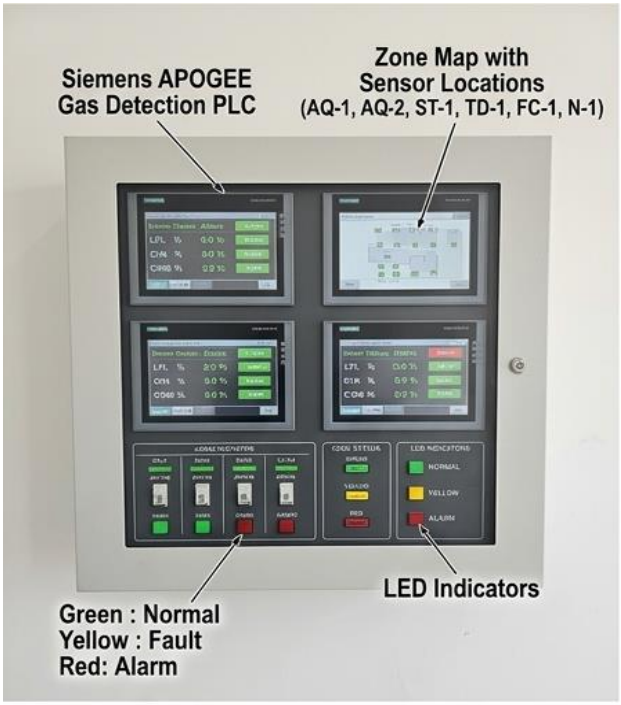


Figure A: Main Gas Detection & Monitoring Panel (Admin/HSE Office)

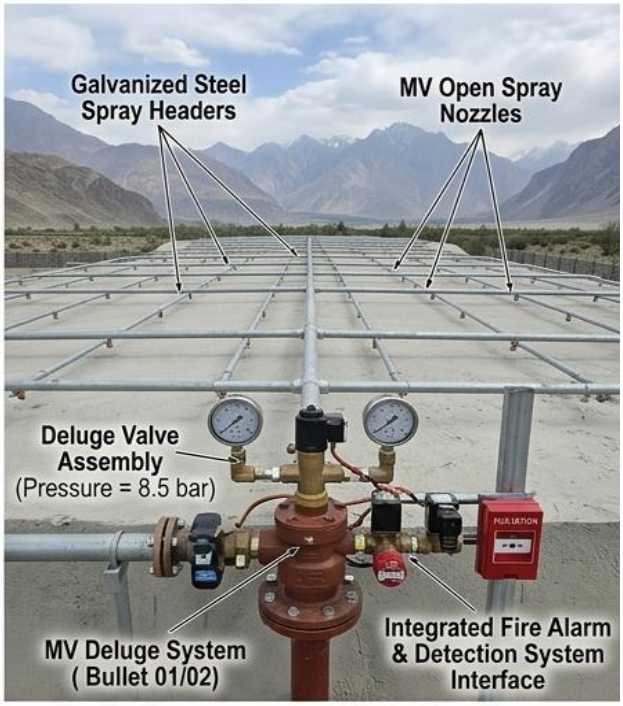


Figure B: Medium Velocity (MV) Water Spray System (Storage Mounds)

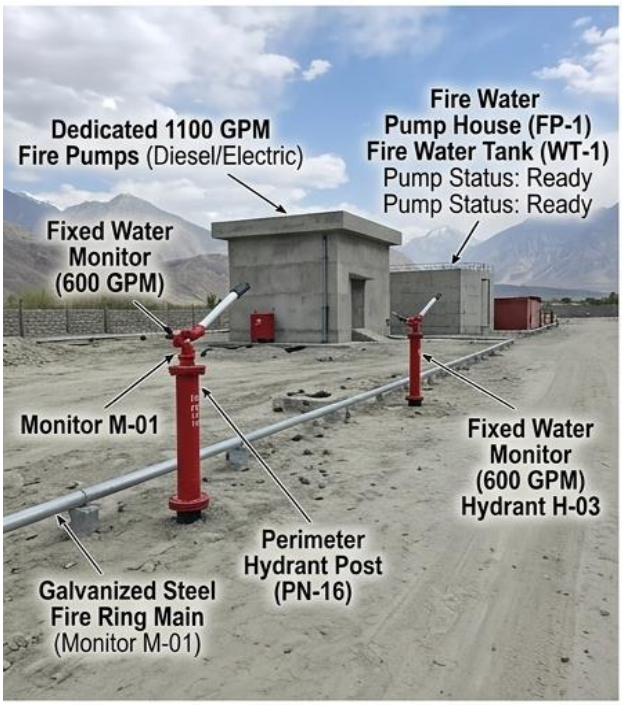


Figure C: Fire Hydrant & Monitor Network (Site Perimeter & Access Road)

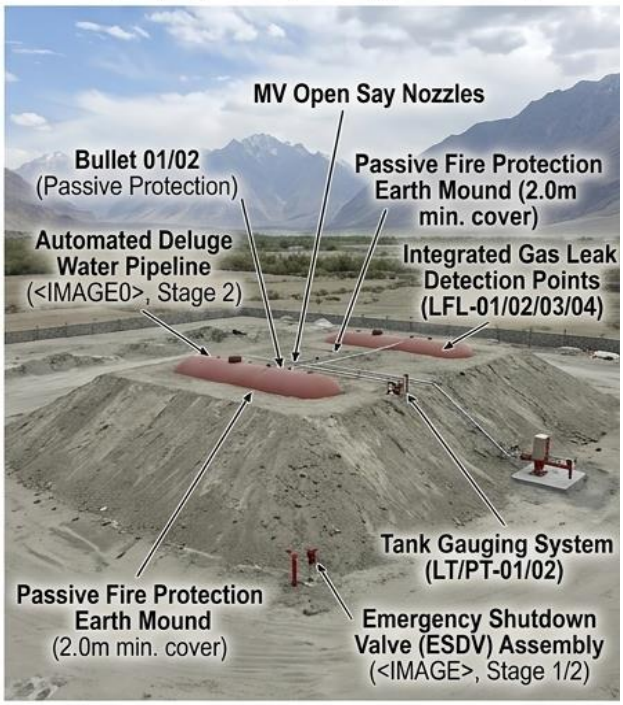


Figure D: Completed Mounded Storage Bullets & Passive Fire Control

Figure 6: Installed As-Built Safety and Fire Protection Infrastructure A four-panel technical layout documenting the commissioned safety systems for operational readiness: (A) Main Gas Detection & Monitoring Panel in the Admin/HSE office; (B) Medium Velocity (MV) Water Spray System headers and deluge valve assembly over the storage mounds; (C) Perimeter Fire Hydrant and 600 GPM Water Monitor network linked to the 1100 GPM pump house; and (D) Completed Mounded Storage Bullets featuring 2.0-meter earth cover, automated ESDVs, and integrated gas leak detection points.

5.5.5 Recommendation for Detailed Quantitative Risk Assessment

This qualitative HIRA is appropriate to the scope of an EIA and is sufficient to demonstrate that the project's design has been informed by a structured consideration of LPG-specific hazards. However, given the Critical-consequence rating attached to the low-likelihood vessel-failure scenario (H-5), it is recommended — and is, in any event, a standard requirement of OGRA's technical licensing process (Chapter 3, Section 3.6.3) — that the proponent commission a detailed, site-specific Quantitative Risk Assessment (QRA) from a qualified process-safety specialist prior to final commissioning. Such a QRA would typically include consequence modelling (e.g., jet-fire, flash-fire and vapour-cloud dispersion footprints) for the specific vessel geometry, inventory and site layout, benchmarking of separation distances against OGRA's mandatory siting criteria and recognized codes (NFPA 58), and confirmation of the adequacy of the fire-water and emergency-response provisions sized in Chapters 2 and 8. This report does not itself present consequence-distance modelling, which requires specialist software and inputs beyond the scope of an environmental baseline study; the finding of this HIRA is that the project's layered control philosophy is sound in principle, and that the specialist QRA is the appropriate mechanism to confirm and, if necessary, refine specific separation distances and emergency-planning zones.

5.6 Cumulative Impacts

No other industrial developments of comparable scale are known to be located within the project's local Area of Influence (Chapter 4); the project is not therefore expected to combine with other developments to produce a materially greater cumulative impact on air quality, noise, or water resources. The principal cumulative consideration identified is positive: the project's contribution, alongside any other LPG-supply initiatives in the Baltistan region, to a cumulative reduction in regional firewood demand and associated deforestation pressure (Section 5.7).

5.7 Positive and Beneficial Impacts

Consistent with the project's stated rationale (Chapter 1), the assessment identifies the following beneficial impacts as material and, in several cases, of Moderate-to-Major positive significance over the project's operating life:

- Reduced deforestation and fruit-tree loss in the Skardu-Baltistan region through displacement of firewood as a primary heating/cooking fuel (supports the objectives of the GB Forest Act, 2019 — Chapter 3).
- Reduced indoor and ambient air pollution associated with biomass burning, with associated public health benefit.
- Direct and indirect local employment during construction and operation.
- Improved, more reliable energy access for domestic and commercial consumers across Baltistan.
- Community infrastructure benefit through the CSR-related road access and widening works described in Chapter 6.

5.8 Summary Impact Matrix

Impact	Phase	Nature	Significance (Pre-mitigation)	Significance (Post-mitigation)
Soil disturbance	Construction	Negative	Minor	Negligible
Construction	Construction	Negative	Minor–	Negligible

Impact	Phase	Nature	Significance (Pre-mitigation)	Significance (Post-mitigation)
noise			Moderate	–Minor
Dust / air emissions	Construction	Negative	Minor	Negligible
Employment generation	Construction	Positive	Moderate	Moderate–Major
Routine air emissions	Operation	Negative	Minor	Negligible
Wastewater	Operation	Negative	Negligible	Negligible
Solid waste	Operation	Negative	Minor	Negligible
Operational noise	Operation	Negative	Minor	Negligible –Minor
LPG release / fire / explosion hazard (H-1 to H-8)	Operation	Negative	Medium–High (see 5.5.3)	Low–Medium, with QRA-confirmed controls
Forest conservation / reduced firewood demand	Operation	Positive	Moderate	Major
Community road access / infrastructure (CSR)	Construction/Operation	Positive	Moderate	Moderate–Major
Decommissioning — residual contamination	Decommissioning	Negative	Moderate	Minor

Chapter 6: Environmental Management Plan

6.1 Introduction and Objectives

This Environmental Management Plan (EMP) sets out how the mitigation measures identified in Chapter 5 will be implemented, who is responsible for implementing them, the standard against which performance will be judged, and the cost of doing so. It covers the construction and operational phases of the project, and is structured around the environmental attributes affected — air, noise, water, soil, solid and hazardous waste, and the ecological and socio-economic environment — together with dedicated sections on sanitation infrastructure (Section 6.5), Corporate Social Responsibility (Section 6.6), occupational health and safety (Section 6.7), environmental monitoring (Section 6.8), and indicative implementation costs (Section 6.10).

The specific objectives of this EMP are to: treat and dispose of liquid, gaseous and solid wastes so as to meet NEQS and GB-EPA requirements; support good working conditions and safety for the project workforce; promote greenery and landscaping appropriate to the site; reduce fire and accidental hazard, consistent with the HIRA in Chapter 5; and provide a monitoring and reporting framework that allows the proponent, GB-EPA, and the local community to verify that these commitments are being met.

6.2 Institutional Arrangements and Responsibilities

Role	Responsibility
Plant Manager (Proponent)	Overall accountability for EMP implementation during operation; liaison with GB-EPA and OGRA; approval of budget for environmental/safety expenditure; incident reporting.
Construction Contractor	Day-to-day implementation of construction-phase mitigation measures; provision of PPE and welfare facilities; compliance with EMP as a contract condition; budget allocation for EMP implementation during construction.
Environmental Officer (EO) — Construction Phase	Site-level monitoring and inspection of environmental compliance; incident reporting; community liaison and grievance handling; verification of contractor compliance; monthly compliance reporting to the Plant Manager.
HSE / Environmental Officer — Operational Phase	Implementation and record-keeping for the operational EMP and monitoring plan (Section 6.8); coordination of the Emergency Response Team (Chapter 8); annual internal environmental audit; liaison with GB-EPA on reporting obligations (Section 6.11).
Workers / Plant Staff	Compliance with PPE requirements, SOPs, and reporting of near-misses/incidents to the EO or Plant Manager.

6.3 EMP — Construction Phase

6.3.1 Air Quality

- Water sprinkling of exposed surfaces, soil piles and unpaved internal roads during dry, dusty conditions, particularly when wind direction is toward Kowardu village.
- Windshield walls or tarpaulin covering of stockpiles where sprinkling alone is insufficient.
- Covered transport of dust-prone construction materials; damp delivery of aggregate to any on-site batching point.

- Periodic emissions/maintenance checks on construction vehicles and equipment; idle-running minimized during loading/unloading.

6.3.2 Noise

- Pre-deployment noise survey of major construction equipment, with equipment exceeding acceptable levels serviced, fitted with mufflers, or replaced.
- Restriction of construction activity to daylight hours; prohibition on horn use on the access road and within the site.
- Provision of hearing protection (ear muffs/plugs) to workers in identified high-noise areas.

6.3.3 Soil and Water

- Impervious, bunded storage for fuels and construction chemicals, sized to contain the largest single container plus freeboard.
- No vehicle-maintenance activity permitted on unprotected ground; spill-response materials (absorbents) kept on site.
- Garland drains around stacking/loading areas to prevent uncontrolled run-off toward groundwater recharge areas.

6.3.4 Construction Waste

- Segregation of construction debris (rubble, steel scrap, wooden scrap) at source; inert material reused for low-lying area filling where practicable; scrap sold to licensed scrap dealers.
- Biodegradable camp waste composted in designated pits; all other camp waste collected and removed to an approved disposal point — no waste dumped outside the site boundary.

6.3.5 Workforce Welfare and Safety

- Local labour engaged preferentially, reducing the need for a large residential worker camp and associated infrastructure pressure.
- Adequate sanitation, drinking water and rest facilities provided for the construction workforce.
- PPE (helmets, safety footwear, eye/ear protection, high-visibility clothing) provided and its use enforced; pre-employment and periodic medical checks for the workforce.

6.4 EMP — Operational Phase

6.4.1 Air Quality

- Preventive maintenance programme for LPG pumps, compressors and pipework to minimize fugitive vapour leaks; tank seals and caps inspected and maintained in good condition.
- Leak and vapour-loss monitoring using the fixed gas detection system (Chapter 2), supplemented by periodic hand-held leak survey of flanges, valves and fittings.
- Standby generator stack height maintained at least 3 m above ground/roof level; generator serviced to manufacturer specification; vehicles switched off rather than left idling during loading/unloading.

6.4.2 Noise

- Loading and unloading of cylinders and tankers restricted to daylight hours.
- Vehicles and mechanical equipment maintained to manufacturer specification; ear protection provided to workers in identified high-noise areas (pump house, compressor area).

6.4.3 Water and Wastewater

Operational water demand is limited to sanitation, general housekeeping, and the fire-water reserve (Chapter 2). Wastewater management is addressed in detail in Section 6.5 (Sanitation and Sewage Treatment).

6.4.4 Solid and Hazardous Waste

The waste streams anticipated during operation, and their management route, are summarized below; this table forms the basis of the operational Waste Management Plan.

Waste Stream	Source	Classification	Management / Disposal Route
Domestic/kitchen waste	Administration block, staff facilities	Non-hazardous, biodegradable	Collected in designated bins; composted on-site in designated pits or removed to municipal collection point
Office/packaging waste (paper, plastic, cardboard)	Administration, cylinder packaging	Non-hazardous, recyclable	Segregated at source; sold/handed to licensed scrap and recycling dealers
Used lubricating oil	Pump/compressor maintenance	Hazardous	Stored in sealed, labelled drums on an impervious, bunded platform; collected periodically by an OGRA/EPA-recognized used-oil recycler; never disposed of to ground or drains
Off-spec / rejected cylinder valves, fittings	Weight/leak-testing rejects	Non-hazardous scrap (metal)	Segregated; returned to manufacturer where possible or sold as scrap
Spill-response / contaminated absorbent material	Accidental spill response	Hazardous (if hydrocarbon-contaminated)	Stored in labelled hazardous-waste containers pending disposal via a licensed hazardous-waste contractor; disposal certificates retained
Sewage / septic sludge	Staff toilets	Non-hazardous (requires controlled handling)	Septic tank de-sludged periodically by licensed vacuum-tanker service (see Section 6.5)

General principles applied across all waste streams: no waste of any kind will be dumped outside the plant boundary; all hazardous waste is segregated from non-hazardous waste at the point of generation; all hazardous-waste containers are labelled; and equipment or material containing asbestos, polychlorinated biphenyls (PCBs) or ozone-depleting substances will not be used at the facility.

6.4.5 Ecological Environment — Green Belt and Landscaping

As noted in Chapter 2, six Kanals of land within the plant premises have been earmarked by the proponent for development as a green belt, as part of the project's CSR commitment (Section 6.6). Plant species for this green belt will be selected for adaptability to the site's dry, high-elevation conditions and for fast growth with good canopy cover, drawing on native species used elsewhere in the Skardu valley (see the vegetation baseline at Chapter 4, Section 4.5.1). Beyond its amenity value, this green belt is expected to provide a secondary benefit as a partial visual and dust buffer between the plant and the surrounding open land.

Figure A: Initial Site Condition (Pre-Plantation) - 6-Kanal Area — April 2026

Figure B: Plantation Implementation Phase — June 2026

Figure C: Established Green Belt (Progress View) — September 2026

6.5 Sanitation and Sewage Treatment System (STP)

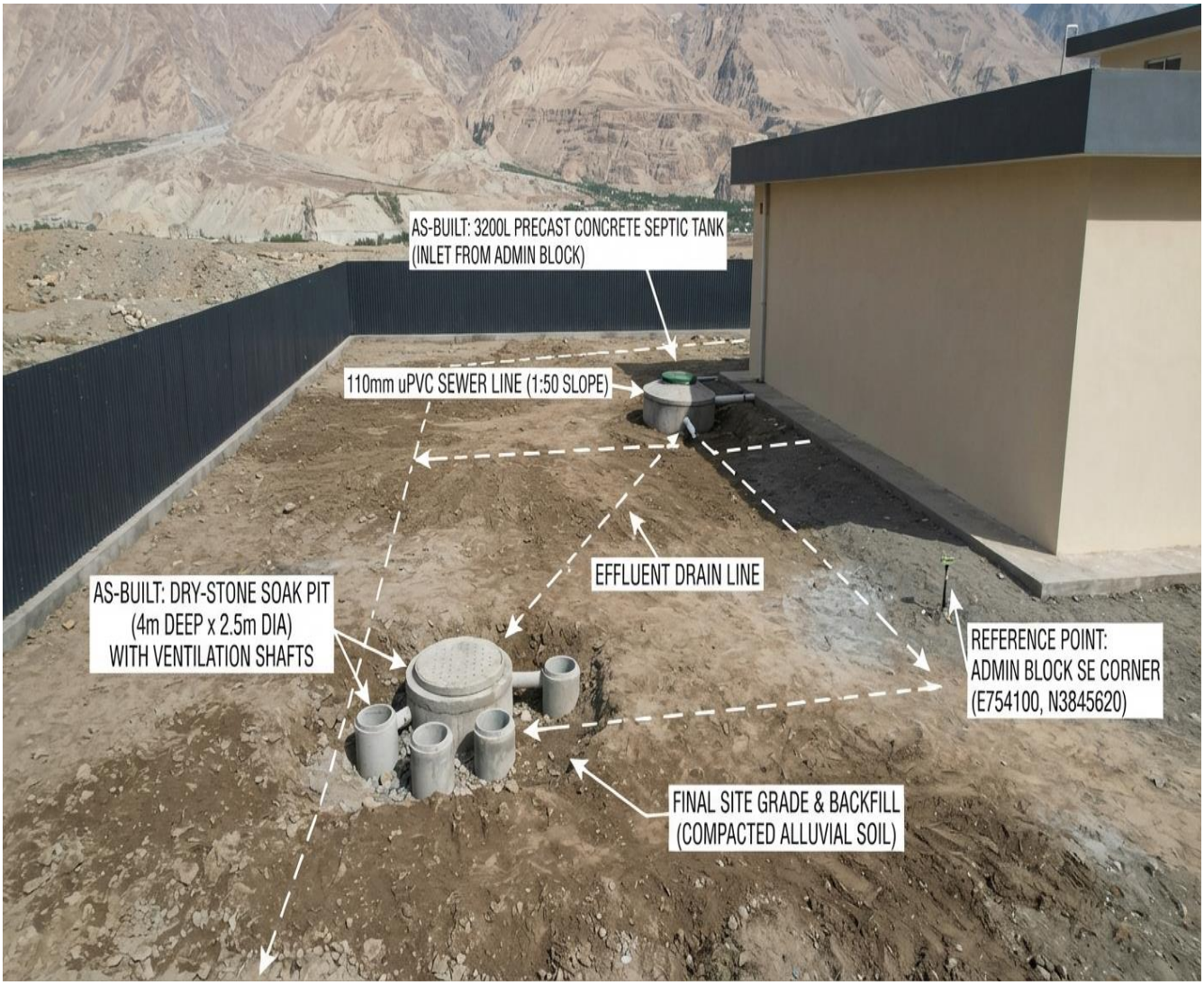
The plant's domestic wastewater load is limited to staff toilets, a small kitchen, and general washing, consistent with a facility with a modest resident staff complement rather than a large workforce (Chapter 2, Section 2.6). On this basis, a septic tank followed by a soak pit — rather than a mechanical Sewage Treatment Plant (STP) — is the appropriate and practically maintainable solution for a remote site of this kind, and is the system proposed for the administration block (Chapter 2, Section 2.3.2).

6.5.1 Design Basis

Parameter	Basis
Design population	15 to 20 resident/day staff (comprising plant operators, security personnel, and administrative staff) — confirmed against the lean staffing plan
Wastewater generation rate	45 liters/person/day (totaling approx. 675–900 liters/day) for a non-residential industrial facility with basic kitchen/toilet use
Septic tank retention time	Minimum 24 hours at design flow (utilizing a dual-compartment precast concrete tank with a nominal capacity of 2.0 to 2.5 cubic meters, per standard sanitary engineering practice)
Soak pit design	Sized to local soil percolation rate; given the site's boulder/alluvial soil and high gravel content, a standard dry-stone lined soakage pit (approx. 1.5 m diameter $\times$ 2.0 m depth) is provisioned, subject to a pre-construction percolation test
De-sludging frequency	Every 1–2 years, or as indicated by sludge level inspection, via a licensed municipal vacuum-tanker service operating from Skardu town

6.5.2 Operation and Maintenance

- The septic tank and soak pit will be inspected quarterly by the HSE/Environmental Officer for signs of surfacing effluent, odour, or reduced percolation.
- De-sludging will be scheduled proactively rather than reactively, with records of each de-sludging event (date, volume, contractor, disposal location) retained on-site and available to GB-EPA on request.
- No industrial process wastewater will be directed to the septic system; any accidental hydrocarbon contamination of the sanitation system will be treated as a reportable incident under the Emergency Response Plan (Chapter 8).



6.6 Corporate Social Responsibility (CSR)

The proponent's CSR programme for this project has focused on practical, locally relevant infrastructure benefit for the Kowardu community, delivered ahead of and alongside project development, in addition to the environmental and employment benefits described elsewhere in this report.

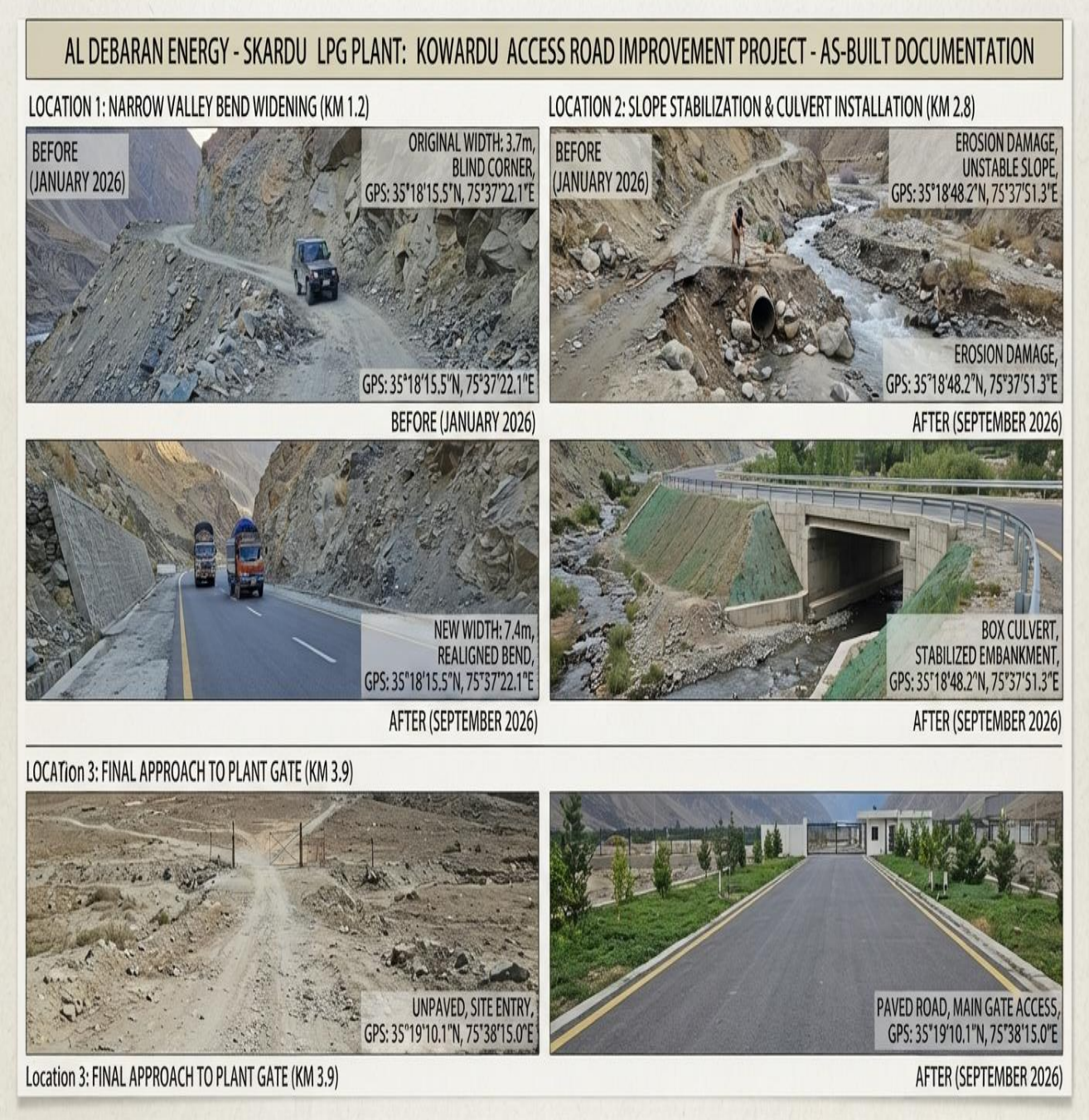
6.6.1 Land for Community Road Access

The proponent has purchased 10 Marlas of land to provide formal road access for the adjacent community, addressing a local access constraint that predated the project.

6.6.2 Widening and Realignment of the Kowardu Access Road

Prior to the proponent's improvement works, several sections of the unmetalled road linking Kowardu village to the project site were constrained by narrow, sharply curved bends, at which point two vehicles could not pass each other and, at the tightest points, a single loaded heavy vehicle could pass only with difficulty. This condition affected not only project-related traffic but the everyday passage of the local community along their own access route.

As part of its CSR commitment, and in coordination with the local community, the proponent purchased land at three locations along the main Kowardu road and realigned the affected bends, widening the carriageway at each point sufficiently for two vehicles, including heavy transport, to pass safely. This work directly benefits the Kowardu community's day-to-day access, independent of its function in enabling safe tanker and delivery-vehicle movement to and from the plant.



LAND PURCHASE AND TRANSFER DEED - SKARDU DISTRICT

بیع نامہ اراضی۔ ضلع سکردو

SECTION 1: AGREEMENT DETAILS & PARTIES

Seller (Vendor): Mr. Sajid Abbas

Saler(بeller :ق ضلع سکردو

Buyer (Vendee): Mr. Muhammad Sagheer

بعروی اراجی:(endee. سکردو

بایا کنہ کی سان ان اسات جائیں کی نامی راں کمرین ر ر ہ ہ 05371110825682229295 ہے تک ہاں تہیں کرنے ہوایہ۔ کی رمیائی مت تی رر ہوگئی ہجیے، شلی ہ 675%ایدی تس 60جامحوت کے پا ئیں کوشکرکہ۔ بہ لے کے بیٹے اللہ جریف ہر وہاں بی ابس بیاتے حق بھی نے محرلیار نے پائیک ساں ن کی یاد کرہ میں (676SSdnaet) (61SKanal) حضرعائے تیا بالس اللہ کرب ج اسماں ہ تبیرہ جرج بیموت بھی کئے راں ی انا کتبی ابو جاتا ہے تے اراکیت کنا کی کہ کو کو زبری مثلس دجر اں گے مکلتاس تو س ہوا یدیٹ اک ن کی بیدوں تھی (366-7A00-176AJO فہی سے سے سب رہیں اکریں ہے۔ ضروتح زنگار تقیسی ابی دو راں پر ئی میان آ س رنے آپ میں تہین آ ر ہو ی۔

Property Description: یاصر بدول تحصیلیں ابکت مثل

Total Consideration: 30-2ہے 1C1 محمی ابی رنے دراضی

عرش اورات 200۔

Payment Terms: یول 12 ابس ہ مجھ کی اِساں محرر (اِمالہ میت ا،) (74N حشت ، اد ہ ی عہ عں 13/ رائیں ، مشن اپی کٹ ار رہی ورر) نے ہدی کی ، اتم کی (3724A توتی بھی 1 ذکریں۔ انی ہے جبری لود و تھیت جتی اس ام کری ہ تگار کی میدر اس اسٹی گری۔ آآ ہے بیدیا ہونا۔

Warranties: یانے لبیں روشن انعش ہو تہ تحر تحر اتی میں منازی تی و تمی کیرے تحیرہ میں خریت ہرت میں دکی زبت ا مان ولوشی ابس تھی ، ہی بھی سرب اس اور خبیہ ابں او ہمی قسمت لی ساہر ہے۔ پہنتے جبی اے تحرری وایوں ، کہ ل ئے سے لیس ہ دو این کی ہتر ن کو حتری ہ تگل نے بیادے ہتی ان ست ری سے ہے عیب۔ جومس اور ہیں کر ٹی راز بہت کے یکیاں بی تریم ک ان کرے بتے بتے جو رہے۔ یا۔ ہیں تھی تمی تین ستوری لیاں کے ہوا ہت بینرح ابیں مو کہا آ ، ت عمر ار ججا اکوں پریا وحما۔

Witness 1: Mr. Sajid Abbas CNICs: +167 144724044	Witness 1 Skacl Witness 2	Seller Signature	Seller Signature
Witness 3333-6763-2244-3	Thumbprints : s.6		Buyer Signature

SECTION 2: REVENUE DEPARTMENT RECORD (ROZNAMCHA WAQIATI)

S.No.	Date	Mutation Number	Seller Name	Buyer Name	Land Area (Kanal-Marla)	Land Type	Remarks
1	24/16/2023		S. Abbas dirr	C. Abbag.	85	کوار تھیر	
2	24/28/2023		امری اور سے بیرے بہ رو اشی عیلی رتیمں	حتیر دلک میں سرستان میرباں	312	کوار تھیر	
3	24/19/2023		حتیر دار رخ خور گی پر دسے ان یاں	حتیر دتا لہ 2 سولان میرباں	102	کوار تھیر	
			کیں رات سے (ماتے وین یپے لئے گو	ہیں روت جیرا نہیں ہیے پرشں رتما			
			اترم دار میں تحفظوں ارلو توحیں نتے۔	یا مکا ، پ دیاک تمی دتال راتجل ہے			
				کیر تحریر ی			

SECTION 3: OFFICIAL CERTIFICATION & ENDORSEMENT

بیع نامہ اراضی۔ ضلع سکردو Mr. Sajli Abbas گی میں کے لیے ، پن سکونتی کرنے کے سے رید تحوہ کے روضح مسئلی کی ریخ ہترت ، کا اطید د کی دھٹی ہوں ، ور ھی ریاں کو حسی لاج میں پراتیح ڈرتا اور کمراس قان دامن میں تقاب کتاان کے مارے متاتاں نے یاحمت تیری اشرت رآ ب میں آن ہیں۔

Official Endorsement

Certification by Tehsildar/Naib Tehsildar

TEHSILDAR SKARDU

Tehsildar Skardu

Tehsiidar Skardu

Official Seal

6.6.3 Green Belt

As described in Section 6.4.5, six Kanals of land within the plant premises have been earmarked for green-belt development, contributing amenity and environmental value beyond the immediate plant boundary.

6.6.4 Summary of CSR Commitments

CSR Initiative	Status	Community Benefit
Purchase of 10 Marlas of land for community road access	Completed	Formalized road access for adjacent community
Realignment/widening of 3 bottleneck sections, Kowardu access road	Completed	Safe two-way and heavy-vehicle passage on the community's own access route
6-Kanal green belt within plant premises	Planned / to be implemented alongside construction	Amenity, dust/visual buffer, local environmental enhancement
Local employment preference (construction and operation)	Ongoing commitment	Direct and indirect local income (see Chapter 5, Section 5.7)

6.7 Occupational Health and Safety (OHS) Plan

- Provision and enforced use of task-appropriate PPE for all workers and visitors entering hazardous areas.
- Pre-employment and periodic (at minimum annual) medical examination for plant staff, with particular attention to respiratory health given the fuel-handling environment.
- Documented Standard Operating Procedures for tanker unloading, cylinder filling, hot work permits, and confined-space entry (if applicable to any tank/vessel maintenance).
- Regular safety toolbox talks and at least annual refresher training for all operational staff, coordinated with the Emergency Response Team training programme (Chapter 8).
- A documented incident/near-miss reporting and investigation procedure, feeding into the annual internal environmental and safety audit.

6.8 Environmental Monitoring Plan

This monitoring plan builds on the baseline established in Chapter 4 and provides the ongoing verification mechanism for the EMP. It distinguishes the one-time baseline characterization already carried out (Chapter 4) from the recurring operational monitoring proposed below.

Parameter	Location(s)	Frequency	Standard / Reference	Responsibility
Ambient air quality ($PM_{2.5}$, PM_{10}, SO_2, NO_2, CO)	AQ-1 to AQ-4 (Chapter 4) or equivalent operational-phase points	Semi-annual	NEQS (Chapter 3)	HSE/Environmental Officer, via accredited laboratory/contractor
Ambient noise ($L_a$eq	N-1 to N-4	Semi-	NEQS	HSE/Environmental

Parameter	Location(s)	Frequency	Standard / Reference	Responsibility
day/night)	(Chapter 4)	annual	(Chapter 3)	Officer
LPG vapour / gas leak survey	All flanges, valves, fittings, filling shed	Continuous (fixed detection) + monthly hand-held survey	Internal SOP / OGRA requirement	Plant Operator / HSE Officer
Fire protection and gas detection system functional test	All systems (hydrants, MV spray, detectors, ESD)	Monthly function test; annual full system test	OGRA / NFPA 58	HSE Officer, with OGRA-approved inspector for annual test
Groundwater / bore-well water quality	W-1 (Chapter 4)	Annual	WHO / Pak-EPA drinking water guidelines	HSE/Environmental Officer, via accredited laboratory
Septic tank / soak pit inspection	STP location	Quarterly	Internal SOP (Section 6.5.2)	HSE/Environmental Officer
Soil quality (spot-check near process areas)	S-1, S-2 (Chapter 4)	Annual, or following any reportable spill	Internal baseline comparison	HSE/Environmental Officer
Waste generation and disposal record	Plant-wide	Continuous log; monthly summary	Internal SOP (Section 6.4.4)	HSE/Environmental Officer
Internal environmental/safety audit	Whole facility	Annual	This EMP / GB-EPA approval conditions	Plant Manager, with external auditor

6.9 Decommissioning Plan (Outline)

Consistent with Chapter 5, Section 5.4, a site-specific Decommissioning Plan will be prepared and submitted to GB-EPA in advance of any eventual facility closure. At outline level, this will include: an environmental site assessment (soil/groundwater sampling around process areas) to establish whether any residual hydrocarbon contamination is present; safe purging and gas-freeing of all vessels and pipework prior to dismantling; scrapping and removal of metal structures and equipment; decontamination (or certified disposal) of any contaminated soil identified; and re-contouring of the site to allow natural surface-water drainage without inducing erosion. The green belt established under Section 6.4.5 is intended to remain in place following decommissioning as a lasting environmental benefit to the site and surrounding area.

6.10 Indicative EMP Implementation Cost Estimate

The table below provides an indicative, planning-level cost estimate for implementation of this EMP, additional to the core project cost presented in Chapter 2. Figures are order-of-magnitude estimates based on typical costs for comparable scope of work at remote sites in Gilgit-Baltistan, and are provided to demonstrate that EMP implementation has been budgeted for, not as fixed quotations; actual costs should be confirmed by the proponent through vendor/contractor quotation at the implementation stage.

EMP Component	Basis / Scope	Indicative Cost (PKR)
Baseline monitoring campaign (air, noise, soil, water — Chapter 4)	One-time, pre-construction; accredited laboratory + field team, 4 locations per parameter	350,000
Semi-annual operational air & noise monitoring	Recurring; per round (4 air + 4 noise locations, laboratory/contractor charges)	150,000 / round (~300,000/year)
Annual water and soil monitoring	Recurring; per year (3 water + 2 soil locations)	120,000 / year
Septic tank + soak pit construction	One-time, sized per Section 6.5.1	600,000
Septic system de-sludging	Recurring; per event, licensed vacuum-tanker service	40,000 / event (1–2 yearly)
Green belt establishment (6 Kanals — plants, irrigation, initial establishment)	One-time, phased over first 2 growing seasons	800,000
Green belt maintenance	Recurring; per year (watering, replacement planting)	150,000 / year
PPE and OHS supplies	Recurring; per year, full workforce	300,000 / year
Worker health check-ups	Recurring; per year, full workforce	150,000 / year
HSE training and emergency drills (see also Chapter 8)	Recurring; per year	200,000 / year
Hazardous waste (used oil, contaminated absorbent) collection/disposal	Recurring; per year, licensed contractor	100,000 / year
Annual internal environmental/safety audit (external auditor)	Recurring; per year	250,000 / year
HSE/Environmental Officer (dedicated or shared role)	Recurring; per year, salary contribution attributable to EMP function	600,000 / year
Contingency (spill-response materials, minor unplanned EMP items)	Recurring; per year	150,000 / year

On the above basis, one-time EMP set-up costs (baseline monitoring, STP construction, initial green-belt establishment) total approximately PKR 1.75 million, and recurring annual EMP costs total approximately PKR 2.32 million per year — together representing a modest addition (well under 5%) to the core project cost presented in Chapter 2, consistent with what a facility of this scale and hazard profile can reasonably be

expected to sustain. These figures should be reviewed and confirmed by the proponent on an annual budgeting cycle, and adjusted for inflation and any conditions attached to GB-EPA's environmental approval.

6.11 Reporting to GB-EPA

The proponent will submit environmental compliance monitoring reports to GB-EPA at a frequency to be confirmed as a condition of environmental approval (typically semi-annual or annual for a facility of this scale), summarizing: monitoring results against the parameters in Section 6.8; a record of any incidents, near-misses, or non-compliances and corrective action taken; waste generation and disposal records; and status of the CSR commitments in Section 6.6. Records supporting these reports — laboratory certificates, inspection logs, training records, and disposal manifests — will be maintained on-site and made available to GB-EPA on request or during any compliance inspection.

Chapter 7: Public Hearing and Departmental Consultations

7.1 Purpose and Regulatory Basis

Stakeholder consultation is a mandatory component of an Environmental Impact Assessment under the GB-EPA (Review of IEE and EIA) Regulations, 2024, and has been carried out consistent with the Guidelines for Public Consultation referenced in Chapter 3. Its purpose is to inform the affected community and relevant government departments about the proposed project, to provide a structured opportunity for concerns and suggestions to be raised, and to ensure that this feedback is genuinely reflected in the project's mitigation measures (Chapter 5), Environmental Management Plan (Chapter 6), and Emergency Response Plan (Chapter 8), rather than treated as a procedural formality.

This chapter presents the consolidated record of the consultation process undertaken for this EIA by Eco Solution and Services Pvt Ltd: structured institutional consultation with the concerned line departments in Skardu (Section 7.3); a public hearing / community consultation session held at the project site (Section 7.4); the photographic record of environmental baseline sampling carried out in the vicinity of the project site (Section 7.5); and the land-ownership documentation furnished by the proponent in support of this report (Section 7.6).

7.2 Consultation Methodology

The consultation process for this EIA was structured in the following stages.

1. Stakeholder identification: the directly affected community (Kowardu/Nazimabad village and households along the access road), local government representatives, and the government departments and agencies whose mandate intersects with the project were identified (Chapter 3, Section 3.10).
2. Institutional consultation: the EIA team undertook structured visits to each concerned line department at its office in Skardu, to brief department representatives on the salient features of the project and to record their institutional input (Section 7.3).
3. Public hearing: a community consultation session was convened at the project site, attended by the EIA consultants, proponent representatives, and notables of the local community (Section 7.4).
4. Environmental baseline sampling: water samples were collected from a spring in the vicinity of the project site and from the Indus River, documented photographically as part of the consultation and disclosure record (Section 7.5; see also Chapter 4, Section 4.4.4).
5. Incorporation: issues and input raised through both the institutional consultations and the public hearing were reviewed against the project design and mitigation measures, and are cross-referenced in Sections 7.4.4 and 7.8 to the specific chapter/section of this report where each has been addressed.

7.3 Line Department Consultations

The Project Manager of Eco Solution and Services, Mr. Ehsan Ali, together with the assigned Environmental Specialist, undertook structured consultation visits to the concerned line departments at their respective offices in Skardu, with a view to briefing each department on the salient features of the proposed project and recording their institutional input. The photographic record of these consultations, together with descriptive captions, is presented below against each department.

7.3.1 Forest, Wildlife & Environment Department, Baltistan, Skardu

The Consultants held consultation with Mr. Khadim Hussain, Conservator of Forests & Wildlife, Baltistan Division, regarding the land status of the project site — confirmed as undeveloped, grassy and sparsely scrub-covered land, not attracting the provisions of the Cutting of Trees (Prohibition) Act or the Forest Act (Chapter 3, Sections 3.7.1–3.7.2) — and any wildlife-habitat considerations arising from the site's proximity to the Indus River system (Chapter 4, Section 4.5).

Photograph 7.1 (a) & (b): Consultants of Eco Solution & Services in consultation with Mr. Khadim Hussain, Conservator of Forests & Wildlife Department, Baltistan, at his office in Skardu.

7.3.2 Fisheries Department, Skardu

The Consultants held consultation with Mr. Ismail, Assistant Director, Fisheries Department, Skardu, regarding the proximity of the project site to the Indus River system and any implications for fish habitat or fisheries resources in the vicinity (Chapter 4, Section 4.5.5).

Photograph 7.2 (a) & (b): Consultants of Eco Solution & Services in consultation with Mr. Ismail, Assistant Director, Fisheries Department, Skardu.

7.3.3 Emergency Rescue Service (Rescue 1122), Skardu

The Consultants held consultation with Mr. Islamuddin, Emergency Officer, Rescue 1122, Skardu, regarding emergency-response coordination for the construction and operation phases of the project, including fire safety, medical emergencies, and seismic emergency-preparedness planning (Chapter 8).

Photograph 7.3: Consultant of Eco Solution & Services in consultation with Mr. Islamuddin, Emergency Officer, Rescue 1122, Skardu.

7.3.4 Skardu Development Authority (SDA), Skardu

The Consultants held consultation with Mr. Syed Arif, Town Engineer, Skardu Development Authority (SDA), regarding master-plan compliance, building-plan approval procedures, and the applicable planning controls under the Gilgit-Baltistan Development of Cities Act, 2020, given SDA's jurisdiction over development-authority functions within Skardu city (Chapter 2, Section 2.4).

Photograph 7.4: Consultants of Eco Solution & Services in consultation with Mr. Syed Arif, Town Engineer, Skardu Development Authority (SDA), Skardu.

7.3.5 Assistant Commissioner, Gamba / Deputy Commissioner, Skardu

In addition to the consultations documented above, land record verification and NOC processing were carried out with the office of the Assistant Commissioner, Gamba, and the Deputy Commissioner, Skardu, resulting in the No Objection Certificate for construction of the LPG storage and filling plant referenced in Chapter 3 (Section 3.6.5) and reproduced in the Annexures to this report (Ref. No. SDG-JC-8(2)/2022, dated 22 July 2026; NOC issued 23 July 2026).

7.3.6 Summary of Line Department Consultations

Department	Representative Consulted	Purpose	Outcome
Forest, Wildlife & Environment Department, Baltistan	Mr. Khadim Hussain, Conservator of Forests & Wildlife	Land status and forest/wildlife implications	Site confirmed as undeveloped, scrub-covered land not attracting Forest Act provisions
Fisheries Department, Skardu	Mr. Ismail, Assistant Director	Proximity to Indus River — fisheries implications	No significant fisheries concern identified for the site
Rescue 1122, Skardu	Mr. Islamuddin, Emergency Officer	Emergency-response coordination (Chapter 8)	Coordination basis established for fire, medical and seismic emergency response
Skardu Development Authority (SDA)	Mr. Syed Arif, Town Engineer	Master-plan / building-plan compliance	Applicable planning controls confirmed (Chapter 2, Section 2.4)
AC Gamba / DC Skardu	Office of the Assistant Commissioner, Gamba	Land record verification; NOC	NOC issued — Ref. SDG-JC-8(2)/2022 (see Annexures)

7.4 Public Hearing and Community Consultation

7.4.1 Hearing Details

Particular	Detail
Venue	Project site, Nazimabad Kowardu, Skardu
Date	August 11, 2026
Attended by	Consultants of Eco Solution and Services; representatives of the Proponent (Al Debaran Energy Pvt Ltd); notables and residents of the local community
Number of community attendees	11 attendees (confirmed from field attendance record and visual documentation at the consultation session)

A public hearing / community consultation session was held at the project site, attended by the Consultants of Eco Solution & Services, representatives of the Proponent, and notables of the local community. Queries and concerns raised by community participants were duly recorded and addressed by the Consultants.

Photograph 7.5: Consultants of Eco Solution & Services, Proponent representatives, and community notables during the public hearing / community consultation session at the project site.

7.4.2 Proceedings and Community Feedback

The hearing followed the standard format for such sessions: an introduction to the project's purpose, location, design and process (Chapters 1 and 2); a summary of the principal environmental and safety findings and the mitigation, monitoring and emergency-response commitments proposed (Chapters 5, 6 and 8); and an open floor for questions and comments from attendees, which were recorded by the Consultants for incorporation into this report.

Photograph 7.6 (a) & (b): Consultants of Eco Solution & Services recording the queries and concerns raised by community participants during the public hearing session; the project was well received, with the community expressing broad support.

7.4.3 Issues Raised and Proponent's Response

The overall community response recorded at the hearing was positive, with broad support expressed for the project, reflecting its role in improving local energy access and reducing dependence on firewood (Chapter 1, Section 1.5). The table below records the specific issues, questions and suggestions raised during the session, together with the proponent's response and the corresponding section of this report where each is addressed; it should be finalized against the detailed hearing minutes.

Ref.	Issue / Question Raised	Proponent's Response	Cross-reference
1	Safety of the local community given the storage and handling of large volumes of flammable liquefied petroleum gas (LPG).	Highlighted the implementation of state-of-the-art safety engineering, including mounded storage bullets with 2.0-meter earth cover, automated Emergency Shutdown Valves (ESDVs), an integrated gas detection network, and a dedicated 1100 GPM fire water system.	Chapter 5, Section 5.5; Chapter 8
2	Employment opportunities for local residents and youth from Kowardu and surrounding Skardu areas during construction and operation phases.	Confirmed that preference will be given to local skilled and unskilled labor in accordance with the project's lean staffing and local hiring policy, maximizing socioeconomic benefits for the host community.	Chapter 5, Section 5.7; Chapter 6, Section 6.6
3	Potential impact of heavy bowser and tanker traffic on the non-metalled access road, local dust generation, and traffic safety.	Outlined planned traffic management measures, lower vehicle movement frequencies during off-peak hours, and dust suppression protocols along the unpaved access corridor.	Chapter 5, Section 5.3.5; Chapter 6, Section 6.6.2
4	Protection of local agricultural tree belts (Poplar and Willow) and management of domestic wastewater/sanitation.	Assured zero discharge into agricultural channels, implementation of a septic tank and soak pit system for sanitary management, and a commitment to preserving and expanding green buffers around the perimeter.	Chapter 6, Section 6.5; Chapter 7, Section 7.2

7.5 Photographic Record of Environmental Baseline Sampling

As part of the environmental baseline assessment (Chapter 4, Section 4.4.4), the Consultants collected water samples from a spring in the vicinity of the project site and from the Indus River, at a representative location at a safe distance from the project site, for laboratory water-quality analysis. These locations correspond to sampling points W-2 (surface water) and W-3 (community/spring source) referenced in Chapter 4; laboratory results should be appended to Chapter 4, Section 4.4.4 once analysis is complete.

Photograph 7.7: Collection of a water sample from a spring in the vicinity of the project site for baseline water-quality analysis.

Photograph 7.8 (a): Collection of a water sample from the Indus River, at a representative location away from the project site, for baseline water-quality analysis.

Photograph 7.8 (b): Indus River sampling location, at a representative distance from the project site, for baseline water-quality analysis.

7.6 Land Ownership Documentation

Copies of the legal documents pertaining to ownership of the project land, furnished by the Proponent, are reproduced below as documentary evidence, supplementing the Assistant Commissioner Gamba correspondence referenced in Section 7.3.5 and annexed to this report.

بیع نامہ اراضی

مایا نکہ میں ساجد عباس ولد عنایت علی شناختی کارڈ نمبر 71103-8862296-3 ساکن متعین آباد کوارد تحصیل گمبہ ضلع سکردو (بائع) بلا کسی جبر و اکراہ وحواس خمسہ کے بدین اقرار لکھ دیتا ہوں کہ میں مقرر کی خریدہ کردہ انتقال شدہ اراضی زیر خسرہ نمبر 675/663/653/651/644/1 زیر انتقال نمبر 662 واقع میں شگر روڈ ناظم آباد موضع کوارد و تحصیل گمبہ ضلع سکردو رقبہ قطعاوی 21 کنال 11 مرلہ (21Kanal, 11 Marla) جو کہ میں مقر کے زیر قبضہ اور زیر تصرف ہے ہر قسم کے بار معاہدہ سے پاک و بیبرا ہے۔ میں بائع مذکورہ بالا اراضی کو بعوض مبلغ 800,000/- (آٹھ لاکھ) فی کنال کے حساب سے کل رقم 17240,000/- (ایک کروڑ بہتر لاکھ چالیس ہزار) روپے میں مسمی معظم صغیر ولد صغیر احمد قومی شناختی کارڈ نمبر 37405-4366343-3 ساکن مکان نمبر 333/A لین 4 پشاور روڈ راولپنڈی کو بیع قطعی کر کے مشتری مذکور سے مبلغ 17240,000/- (ایک کروڑ بہتر لاکھ چالیس ہزار) روپے نقد یکمشت وصول پایا ہے اور مشتری مذکور کو مذکورہ اراضی پر قابض متصرف کرا دیا ہے اراضی مذکورہ مشتری مذکور کے نام محکمہ مال میں انتقال کرانے کے بابت من بائع کا کوئی عذر و اعتراض نہیں ہے۔ اور یہ کہ من بائع اراضی مذکورہ کا شرعاً قانوناً مالک و متصرف ہے اور حق بیع کا مجاز رکھتا ہے۔ جس پر من بائع کے کسی رشتہ دار، وارثان، قائم مقام وغیرہ کو حق دعویٰ یا عذر و اعتراض نہ ہوگا۔ تاہم کوئی دعویدار نکلے یا قانونی تقم پائے جس سے مشتری کو اراضی مذکورہ سے بے دخل ہونا پڑنے کی صورت میں بائع مذکورہ اراضی ہذا کے برابر متبادل اراضی دینے کا پابند ہوگا۔ اور کاغذات مال میں مشتری کے نام درج و تصدیق کرنے کا بائع پابند ہوگا (خرچہ مشتری کا ہوگا)۔

لہذا بیع نامہ اراضی رو برو گواہان لکھ دی گئی تا کہ سند رہے اور بوقت ضرورت کام آئے۔

تحریر 24-10-2024

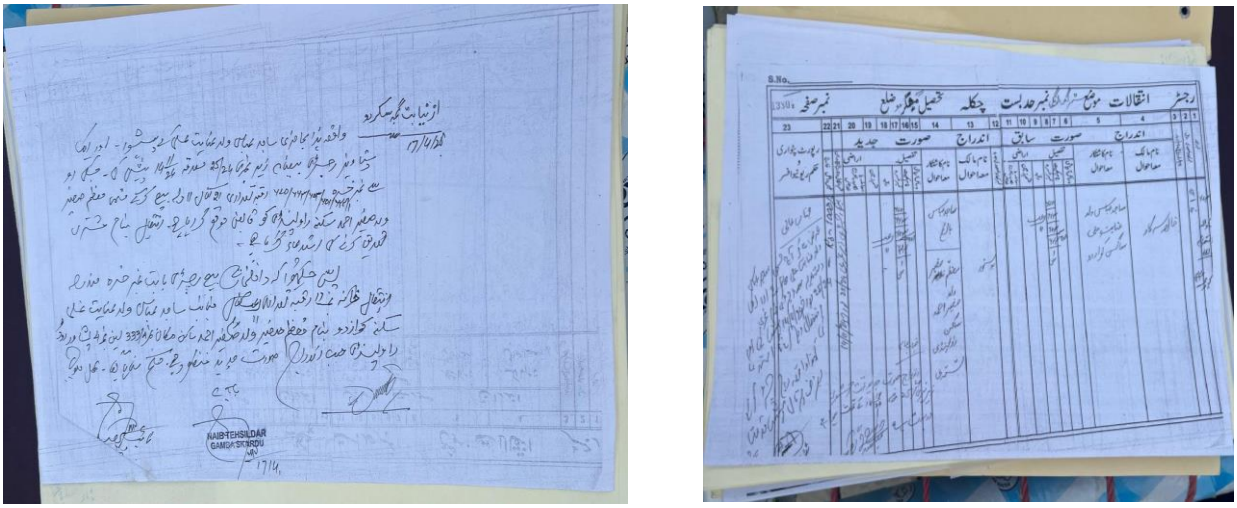
گواہ نمبر 1
طاہر عباس ولد خان بہادر
ساکن ہریالی سیداں تحصیل و ضلع راولپنڈی
37405-1472896-3

الجواب بائع
ساجد عباس ولد عنایت علی شناختی کارڈ نمبر 71103-8862296-3 ساکن متعین آباد کوارد تحصیل گمبہ ضلع سکردو

گواہ نمبر 2
عابد حسین ولد علی حسین ساکن شیر تھنگ اولڈنگ سکردو
71103-6266602-9

الجواب مشتری
معظم صغیر ولد صغیر احمد قومی شناختی کارڈ نمبر 37405-4366343-3 ساکن مکان نمبر 333/A لین 4 پشاور روڈ راولپنڈی

Photograph 7.9: Registered sale deed (Baye Nama) evidencing transfer of ownership of the project land in favour of the Proponent.



Photograph 7.10 (a) & (b): Supporting revenue-record documentation — mutation report and register-of-mutations extract — corroborating the recorded land ownership.

Note: the land-ownership documents reproduced above contain personal identifying details (CNIC numbers, photographs and signatures of the private individuals party to the transaction). They are included here, consistent with the proponent's own consultation record, solely as evidentiary support for this regulatory submission and should be handled by GB-EPA and the proponent in line with applicable record-confidentiality practice.

7.7 Grievance Redress Mechanism

In addition to the formal public hearing, the proponent has established an ongoing Grievance Redress Mechanism (GRM) for the operational life of the project, allowing community members to raise concerns at any time rather than only at the hearing stage.

- Grievances may be lodged verbally or in writing with the Plant Manager, through the Union Council, or via a dedicated contact number to be displayed at the plant gate and communicated to the Kowardu community.
- All grievances will be logged in a Grievance Register (date, complainant, nature of concern, action taken, date closed), maintained by the HSE/Environmental Officer (Chapter 6, Section 6.2).
- The proponent commits to acknowledging a grievance within 3 working days and providing a substantive response or resolution within 15 working days, escalating to GB-EPA where a grievance cannot be resolved directly.
- A summary of grievances received and their resolution status will be included in the periodic compliance reports submitted to GB-EPA (Chapter 6, Section 6.11).

Contact Point	Detail
Plant Manager / on-site contact	Engr. Tariq Mehmood (Al Debaran Energy Pvt Ltd, Skardu Site Office)
Dedicated grievance contact number	+92 5815 450123 / +92 300 9876543
Union Council focal person, Kowardu	Malik Muhammad Hussain (Community Representative / UC Kowardu Focal Person)

7.8 Incorporation of Consultation Findings into the EIA

Consultation is treated in this EIA as an input to project design, not solely a disclosure exercise. The table below cross-references the principal themes arising from the institutional and community consultations documented in this chapter to the specific measures adopted in response.

Consultation Theme	How Addressed in this EIA
Forest/wildlife status of the site (Section 7.3.1)	Confirmed non-forest land use (Chapter 3, Section 3.7; Chapter 4, Section 4.5)
Fisheries/Indus River proximity (Section 7.3.2)	Aquatic ecology baseline and no-material-impact finding (Chapter 4, Section 4.5.5)
Emergency-response coordination (Section 7.3.3)	Emergency Response Plan and Rescue 1122 mutual-aid coordination (Chapter 8)
Planning/building-control compliance (Section 7.3.4)	Site layout and design compliance (Chapter 2, Section 2.4)
Community safety given LPG storage/handling	Dedicated HIRA (Chapter 5, Section 5.5); layered engineering and procedural controls (Chapter 2, Section 2.9; Chapter 6)
Local employment	Local-hire preference in construction and operation (Chapter 5, Section 5.7;

Consultation Theme	How Addressed in this EIA
	Chapter 6, Sections 6.3.5 and 6.6.4)
Road condition / traffic safety	CSR road-widening and realignment works (Chapter 6, Section 6.6.2)
Water resources	Baseline sampling of spring and Indus River sources (Section 7.5; Chapter 4, Section 4.4.4)
Ongoing communication / complaint handling	Grievance Redress Mechanism (Section 7.7); periodic GB-EPA reporting (Chapter 6, Section 6.11)

7.9 Summary and Status

Institutional consultation with the Forest, Wildlife & Environment Department, the Fisheries Department, Rescue 1122, and the Skardu Development Authority has been completed, as documented in Section 7.3, together with land-record verification and NOC processing through the Assistant Commissioner, Gamba. A public hearing / community consultation session has been held at the project site (Section 7.4), with the community's overall response recorded as positive. The specific date, full attendance count, and detailed minutes of the public hearing (Section 7.4.1, Section 7.4.3) remain to be inserted from the field record, and the signed attendance register and detailed proceedings should be annexed to the final version of this report submitted to GB-EPA.

Chapter 8: Emergency Response Plan

8.1 Purpose and Scope

This Emergency Response Plan (ERP) provides the mechanism to contain and control an emergency incident at the LPG storage and filling plant so as to minimize its effect on workers, employees, the surrounding community, the built and natural environment, and business property. It applies to all credible emergency scenarios identified for the project, principally the LPG-specific hazard scenarios (H-1 to H-8) identified in the Hazard Identification and Risk Assessment at Chapter 5, Section 5.5, together with medical emergencies, seismic events, and vehicle accidents on the access road.

The plan is intended to: control or limit the effect of an emergency on personnel, facilities and the environment; provide a structured mechanism for initial response and the early calling of external emergency services where required; ensure the provision of first aid in an effort to preserve life; and ensure efficient communication between the plant and external emergency services during an incident. It should be read together with the fire prevention and detection systems described in Chapter 2 (Section 2.9) and the risk control measures set out in Chapter 5 (Section 5.5.4).

8.2 Potential Emergencies and Linkage to the Hazard Assessment

The table below cross-references each category of emergency covered by this plan to the corresponding hazard scenario(s) identified in the Chapter 5 HIRA, so that the specific procedure in Section 8.9 responds directly to a risk the project has already assessed, rather than being a generic template.

Emergency Category	HIRA Reference (Chapter 5)	Specific Procedure
LPG vapour release / gas leak	H-1, H-2, H-3, H-8	Section 8.9.1
Fire (jet fire, flash fire, shed fire)	H-1, H-3, H-4, H-6	Section 8.9.2
Vessel fire exposure / potential catastrophic failure (BLEVE-type scenario)	H-5	Section 8.9.3
Road tanker / vehicle accident	H-6	Section 8.9.4
Seismic event	H-7	Section 8.9.5
Medical emergency (cold burn, injury, illness)	General occupational risk (Chapter 6, Section 6.7)	Section 8.9.6
Loss of gas detection / fire protection system availability	H-8	Addressed through the preventive maintenance and functional-test regime, Chapter 6, Section 6.8

8.3 Emergency Response Phases

Phase 1 — Emergency Reporting

Any person who discovers or suspects an emergency — a gas leak, fire, injury, or other abnormal condition — must report it immediately, either by activating the nearest manual call point / emergency trip button (Chapter 2, Section 2.9) or by directly informing the Emergency Response Coordinator or any available member of the Emergency Response Team (ERT). Prompt and accurate reporting is treated as the single most important factor in minimizing risk to personnel, equipment and the environment.

Phase 2 — Emergency Response Team Activation

On receiving an emergency alarm or report, the Emergency Response Coordinator will proceed immediately to the location, assess ("size up") the incident, mobilize whatever resources are required from the ERT, and direct the response until the situation is brought under control or handed over to external emergency services.

Phase 3 — Escalation

Where an emergency has the potential to injure personnel, cause significant equipment damage, cause major environmental harm, or threaten the surrounding community, the incident is escalated within the proponent's management structure to support the Emergency Response Coordinator, and external emergency services — principally Rescue 1122, Skardu (Section 8.6) — are notified without delay. The Incident Support Team (Section 8.4) is activated to stand up the Incident & Repair Team, the Investigation Team, and the Communications Team as appropriate.

Where escalation to external resources and/or higher proponent management is required, the Emergency Response Coordinator remains the active on-site coordinating authority, supporting external responders, until relieved or until the incident no longer requires that level of support.

8.4 Emergency Response Organization

8.4.1 Emergency Response Coordinator

The Emergency Response Coordinator is responsible for taking whatever action is required to control an emergency involving fire, explosion, LPG/gas incidents, hazardous materials, medical emergency, or environmental harm. This authority continues until the incident is brought under control or handed over to the relevant statutory authority, at which point the Coordinator adopts a support role. On conclusion of an incident, the Coordinator initiates repair of any defective fire/detection equipment, reports to plant management, and participates in the post-incident investigation (Section 8.10). The Coordinator is also responsible for ensuring that all emergency equipment is maintained, correctly stowed, and that the fire-water reserve is kept full at all times (Chapter 2, Section 2.9).

8.4.2 Emergency Response Team (ERT)

The ERT provides the prompt, trained response to an emergency, working to prevent or reduce injury to personnel, minimize damage to equipment, and minimize environmental harm until relieved by external emergency services. The ERT is to comprise a minimum of 3–5 trained personnel per working shift, managed by the HSE/Environmental Officer (Chapter 6, Section 6.2) and reporting to the Emergency Response Coordinator during any emergency and for training purposes.

8.4.3 Incident Support Team

The Incident Support Team responds immediately in support of the Emergency Response Coordinator and, depending on the situation, stands up three sub-teams:

- Incident & Repair Team — supports the Coordinator in bringing the incident under control and assesses what is required to restore normal plant operation.
- Investigation Team — establishes the root cause of the incident and recommends corrective action to prevent recurrence (Section 8.10).
- Communications Team — manages employee communication, and liaison with customers, the local community, regulatory bodies (GB-EPA, OGRA), and, where necessary, the media.

8.4.4 All Employees, Contractors and Visitors

In the event of an emergency, all persons on-site are to remain at their work location and continue normal activity unless directed to evacuate by the sounding of the evacuation alarm or by direct instruction from the Emergency Response Coordinator or ERT.

8.4.5 Gatekeeper / Security (during working hours)

The gatekeeper/security post supervises the plant's main entrance and provides an additional communication point with arriving emergency services. During an evacuation, the gatekeeper will restrict entry to the plant (other than emergency personnel) and provide the Emergency Response Coordinator with a list of all visitors present at the time of the emergency, to support the muster/headcount process (Section 8.5).

8.4.6 Plant Manager

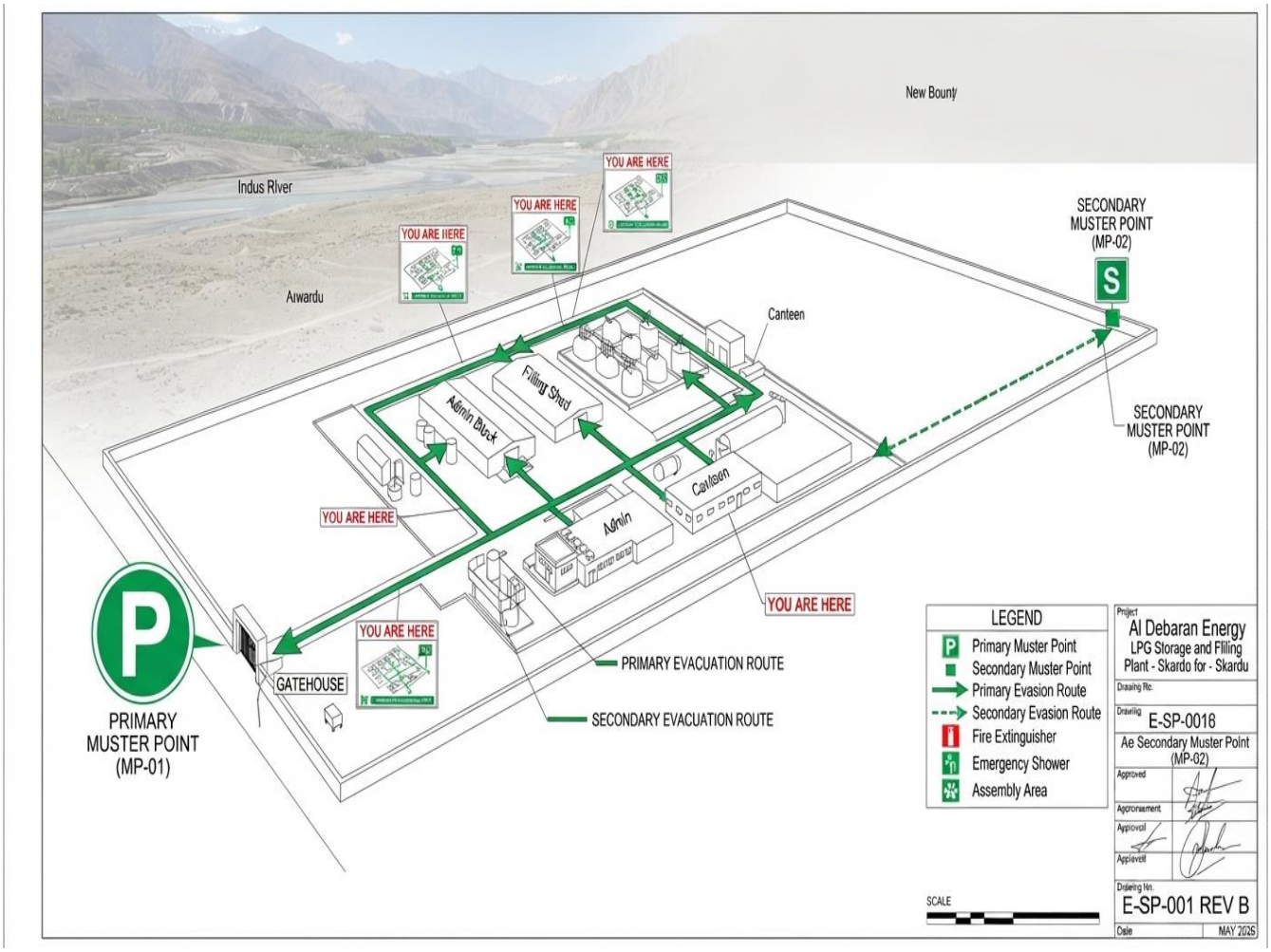
The Plant Manager responds to an emergency as required by the Emergency Response Coordinator, maintains awareness of the status and progress of the incident, and, through the Communications Team, ensures timely and accurate reporting to external authorities, including GB-EPA and OGRA as required by the conditions of environmental approval and operating licence.

8.5 Evacuation and Muster Point Procedure

On activation of the evacuation alarm, all personnel, contractors and visitors will proceed by the nearest safe route — avoiding the affected hazard area and moving upwind/uphill of any vapour release where the direction of release is apparent — to the designated muster point(s), and remain there until a headcount is completed and the all-clear is given by the Emergency Response Coordinator.

Particular	Detail
Primary muster point	Main Administrative Block Frontage (Upwind Sector) — located safely clear of the storage bullets, filling shed, and Tank Decantation Shed (TDS), positioned upwind of the prevailing valley winds
Secondary/alter native muster point	Main Access Gate Area (South-Western Perimeter) — designated for use if the primary point is compromised by an unexpected wind-direction shift or vapor dispersion
Headcount responsibility	Gatekeeper/Security register (staff and visitors) cross-checked by the ERT at the muster point
Evacuation route marking	Routes and muster point(s) to be marked on the site layout plan (Chapter 2, Annexure) and by physical signage on-site

Particular	Detail
Community/external evacuation trigger	Defined in the site-specific QRA recommended at Chapter 5, Section 5.5.5, which should confirm whether any scenario requires evacuation or shelter-in-place advice beyond the plant boundary



8.6 Alarm and Communication Systems

- Automatic gas detection alarms, annunciates at the control room, filling shed, plant manager's cabin and security gate (Chapter 2, Section 2.9).
- Manual call points and emergency trip buttons at strategic locations throughout the plant, distinguished from the evacuation siren: activation of a manual call point signals an abnormal situation via siren only, while the emergency trip button initiates automatic shutdown action.
- A distinct, site-wide audible evacuation alarm, tested periodically (Section 8.8) and known to all personnel through induction training (Section 8.8).
- A dedicated internal communication procedure (radio/mobile contact list) linking the Emergency Response Coordinator, ERT, gatekeeper, and Plant Manager during an incident.
- An external communication procedure for contacting Rescue 1122 and other external services (Section 8.7), displayed at the security gate and control room per the notices described in Section 8.11.

8.7 External Emergency Services and Mutual Aid

Coordination with external emergency services has been initiated as part of the departmental consultation process for this EIA (Chapter 7, Section 7.3.3): the Consultants held consultation with Mr. Islamuddin, Emergency Officer, Rescue 1122, Skardu, regarding emergency-response coordination for the construction and operation phases of the project, covering fire safety, medical emergencies, and seismic emergency-preparedness planning. This consultation forms the basis for the mutual-aid relationship described below, which should be formalized in writing (e.g., a mutual-aid understanding or memorandum) with Rescue 1122 prior to commissioning.

External Service	Role	Contact
Rescue 1122, Skardu (Emergency Officer: Mr. Islamuddin)	Fire suppression support beyond on-site capability; medical emergency response and casualty evacuation; seismic emergency-preparedness coordination	+92 5815 1122 / Emergency Helpline: 1122
District Headquarters Hospital (DHQ), Skardu	Referral hospital for injuries/medical emergencies beyond on-site first-aid capability (Chapter 4, Section 4.6.4)	+92 5815 920042 (DHQ Hospital Main Exchange)
GB-EPA, Baltistan Regional Office	Regulatory notification of reportable environmental incidents (Chapter 6, Section 6.11)	+92 5815 920177 (GB-EPA Regional Office, Skardu)
OGRA (LPG Licensing Wing)	Regulatory notification of reportable safety incidents under the operating licence (Chapter 3, Section 3.6)	+92 51 9211425 (OGRA Headquarters, Islamabad)
Local Police / Union Council, Kowardu	Traffic control and community liaison in the event of an incident affecting the access road (Chapter 6, Section 6.6.2)	+92 5815 920011 (Police Station City Skardu) / UC Kowardu Office

Given the mountainous terrain, weather-dependent access, and travel time from Skardu town to the project site (Chapter 4, Section 4.6.4), the plant's own on-site first-response capability — the ERT, fire-fighting systems (Chapter 2, Section 2.9), and first-aid provision (Section 8.8) — is the primary line of defence in the critical early minutes of any incident, with Rescue 1122 and DHQ Skardu providing escalation support. This makes the robustness of on-site training and equipment (Sections 8.8–8.9) especially important for this project.

8.8 Emergency Equipment, Resources and Training

8.8.1 Equipment

Emergency equipment available at the plant is described in detail in Chapter 2 (Section 2.9) and includes the fire hydrant ring main, Medium Velocity spray system with automatic detection, dedicated and standby fire pumps, portable fire extinguishers, and the gas detection and alarm system. In addition, the plant maintains:

- A dedicated emergency water storage tank (Chapter 2, Section 2.3.1), inspected regularly to confirm it is kept full.
- First-aid provision appropriate to the plant's staffing level, including treatment for cold-burn injury (a specific risk of LPG contact, given its storage as a refrigerated/pressure-liquefied gas) as well as general workplace injury.
- Personal protective and emergency equipment (Chapter 6, Section 6.7) including flame-resistant clothing for the ERT, self-contained breathing apparatus if indicated by the site-specific QRA (Chapter 5, Section

5.5.5), and spill-response materials for the hazardous-waste and spill scenarios described in Chapter 6, Section 6.4.4.

8.8.2 Training and Drills

- All new employees and contractors receive an HSE and emergency-response induction before commencing work, covering alarm recognition, evacuation routes and muster points, and individual roles in an emergency.
- The Emergency Response Coordinator maintains an annual training plan covering the competency requirements of the ERT, including live fire-extinguisher use, first-aid refresher training, and gas-leak/shutdown drills.
- A full site evacuation drill is conducted at least annually, with records kept of attendance, duration, and lessons learned, feeding into the annual internal audit (Chapter 6, Section 6.8).
- Fire protection and gas detection systems are function-tested monthly, with a full system test at least annually by an OGRA-approved inspector (Chapter 6, Section 6.8).

8.9 Specific Emergency Procedures

8.9.1 LPG Vapour Release / Gas Leak (H-1, H-2, H-3, H-8)

1. On detection (automatic alarm or by smell/observation), raise the alarm via the nearest manual call point and inform the Emergency Response Coordinator immediately.
2. Shut down the source if it can be done safely (isolation valve, ESD/emergency trip button); do not attempt isolation if this would require entering a gas-affected area without appropriate PPE and authorization.
3. Eliminate ignition sources in the vicinity — stop all vehicle engines, hot work, and non-rated electrical equipment.
4. Evacuate non-essential personnel from the affected area to the muster point (Section 8.5), accounting for wind direction.
5. The ERT, using appropriate PPE, assesses the leak and, where safe to do so, contains/controls it; where the leak cannot be safely controlled on-site, Rescue 1122 is notified (Section 8.7).
6. Log the incident and initiate the post-incident review procedure (Section 8.10).

8.9.2 Fire (H-1, H-3, H-4, H-6)

1. Raise the alarm immediately; activate the nearest manual call point/emergency trip button.
2. The ERT responds with portable extinguishers and, where the fire is beyond incipient stage, activates the fire hydrant/MV spray system (which is also designed to activate automatically via the quartzite-bulb detection system — Chapter 2, Section 2.9).
3. Evacuate all non-essential personnel to the muster point; the Emergency Response Coordinator assesses whether the fire is within on-site control capability or requires Rescue 1122 mobilization.
4. Where a fire is impinging, or has the potential to impinge, on a storage vessel, the response escalates immediately to the vessel fire-exposure procedure (Section 8.9.3).

8.9.3 Fire Impinging on a Storage Vessel (H-5)

This is the highest-consequence scenario identified in the Chapter 5 HIRA and requires the most decisive response:

1. Immediate activation of the MV spray/deluge system to cool the affected vessel and adjacent vessels, prioritized above all other fire-fighting action.
2. Immediate evacuation of all non-essential personnel to the maximum practicable distance beyond the muster point, and immediate notification of Rescue 1122 with a clear statement that a pressure-vessel fire-exposure scenario is in progress.
3. The Emergency Response Coordinator considers, and where indicated directs, evacuation of the immediate surrounding area beyond the plant boundary, coordinating with the Union Council/local police (Section 8.7) — the specific stand-off distance for this decision should be confirmed by the site-specific QRA (Chapter 5, Section 5.5.5) and pre-agreed with Rescue 1122 as part of the mutual-aid arrangement.
4. No person re-enters the area until the Emergency Response Coordinator, in consultation with Rescue 1122, confirms the vessel has been adequately cooled and the situation stabilized.

8.9.4 Road Tanker / Vehicle Accident (H-6)

1. The driver or nearest witness raises the alarm and, if safe to do so, isolates the vehicle (engine off, no ignition sources) without approaching a leaking or damaged tank.
2. The ERT proceeds to the scene with appropriate PPE and fire-fighting equipment; the access road is closed to other traffic, with police/Union Council support (Section 8.7) if the accident is on the community-shared section of road (Chapter 6, Section 6.6.2).
3. If there is any loss of containment, the response follows the gas-leak/fire procedures above as applicable (Sections 8.9.1–8.9.2); injured persons are treated per Section 8.9.6 and evacuated to DHQ Skardu if required.

8.9.5 Seismic Event (H-7)

1. On strong ground shaking, all personnel take immediate cover and, once shaking stops, evacuate structures (administration block, filling shed) to the muster point, avoiding the immediate vicinity of the storage bullets until they have been visually inspected.
2. The Emergency Response Coordinator directs a structured visual inspection of storage vessels, pipework and fire-protection systems for damage before any resumption of operations.
3. Any indication of vessel, pipework or fitting damage is treated as a potential loss-of-containment event and escalated per Sections 8.9.1–8.9.3 as applicable.
4. Given the region's seismicity (Chapter 4, Section 4.3.3), seismic response is included in the annual drill programme (Section 8.8.2), consistent with the seismic emergency-preparedness planning basis discussed in consultation with Rescue 1122 (Chapter 7, Section 7.3.3).

8.9.6 Medical Emergency

1. Provide immediate first aid, including specific treatment for cold-burn injury where LPG contact has occurred.
2. Notify the Emergency Response Coordinator, who determines whether the casualty can be treated on-site or requires evacuation to DHQ Skardu, arranging transport or requesting Rescue 1122 support (Section 8.7) as appropriate given road/weather conditions (Chapter 4, Section 4.3.2).
3. Log the incident, including cause, treatment provided, and outcome, as part of the OHS record (Chapter 6, Section 6.7).

8.10 Post-Incident Review and Reporting

Following any emergency, however minor, the Investigation Team (Section 8.4.3) establishes the root cause and recommends corrective action to prevent recurrence, and the Communications Team ensures appropriate reporting to employees, the Plant Manager, and — where the incident meets the reportable threshold under GB-EPA's approval conditions or OGRA's licensing requirements — to those regulators (Chapter 6, Section 6.11; Chapter 3, Section 3.6). All incidents, near-misses, and drills are logged in an Incident Register, reviewed as part of the annual internal environmental/safety audit (Chapter 6, Section 6.8), and used to update this ERP and the HIRA (Chapter 5, Section 5.5) where the review indicates a need to do so.

8.11 Notices

The following signage is installed, or is to be installed prior to commissioning, at the plant:

- NO SMOKING – FLAMMABLE GAS, at the bulk storage fence.
- EMERGENCY INFORMATION PANEL, at the bulk storage fence.
- EMERGENCY PROCEDURES, displayed in the site office.
- WARNING NOTICE PROHIBITING SMOKING AND IGNITION SOURCES, at all hazardous-area entry points.
- HAZARDOUS CHEMICAL NOTICES, at the storage area.
- EMERGENCY PHONE NUMBERS, displayed on the LPG storage vessels and at the front gate/security post (Section 8.7 contact directory).
- Evacuation route and muster point signage (Section 8.5), once finalized.

8.12 Emergency Contact Directory

Role / Service	Name	Contact Number
Emergency Response Coordinator	Capt. (Retd.) Waqar Ahmed	+92 301 5557890 / +92 5815 450124
Plant Manager	Engr. Tariq Mehmood	+92 300 9876543 / +92 5815 450123
HSE / Environmental Officer	Mr. Zeeshan Haider	+92 345 7654321
Rescue 1122, Skardu	Mr. Islamuddin, Emergency Officer (per Chapter 7 consultation)	+92 5815 1122 / Emergency Helpline: 1122
DHQ Hospital, Skardu	Medical Superintendent / Emergency Desk	+92 5815 920042
GB-EPA, Baltistan Regional Office	Director / Regional Coordinator	+92 5815 920177
OGRA (LPG Licensing Wing)	Assistant Director (LPG Enforcement)	+92 51 9211425
Union Council focal person, Kowardu	Malik Muhammad Hussain (per Chapter 7, Section 7.7)	+92 355 5123456

This directory is to be finalized, displayed at the security gate and control room as required by Section 8.11, and reviewed at each annual drill (Section 8.8.2) to confirm all contact details remain current.

Chapter 9: Conclusion

9.1 Summary of Findings

This Environmental Impact Assessment has been prepared for the proposed LPG Storage and Filling Plant of M/S Al Debaran Energy Private Limited at Nazimabad Kowardu, District Skardu, Gilgit-Baltistan, upgrading and superseding the earlier Initial Environmental Examination prepared for the project (Chapter 1), in line with the categorization of LPG storage and filling facilities under the GB-EPA (Review of IEE and EIA) Regulations, 2024 (Chapter 3).

The baseline characterization at Chapter 4 confirms that the project site is barren, non-agricultural, sparsely vegetated land, isolated from the nearest population centre (Kowardu, approximately 4 km distant), with no reserved forest, protected area, or recorded cultural-heritage resource within its boundary — findings independently corroborated through the departmental consultations documented in Chapter 7, including confirmation from the Forest, Wildlife & Environment Department that the site does not attract the provisions of the Forest Act, and from the Fisheries Department that no significant fisheries concern arises from the site's proximity to the Indus River.

The impact assessment at Chapter 5 finds that construction-phase impacts (dust, noise, soil disturbance, construction waste) are localized, short-term, and readily reduced to negligible or minor significance through standard mitigation, and that routine operational impacts (air emissions, wastewater, solid waste, noise) are similarly modest given the project's isolated location and modest staffing. The project's principal environmental, health and safety concern — the presence of a bulk quantity of pressurized, flammable LPG — has been addressed through a dedicated Hazard Identification and Risk Assessment (Chapter 5, Section 5.5), which finds that the project's layered control philosophy (inherently safer mounded storage, engineering controls, ignition management, fire protection, procedural controls, and emergency preparedness) is soundly based in principle, while recommending that a specialist Quantitative Risk Assessment be commissioned to confirm and, if necessary, refine specific separation distances ahead of final commissioning.

Against this, the assessment identifies substantive positive impacts: direct and indirect local employment (Chapters 5 and 6); a continuing contribution to reduced firewood dependence and associated forest conservation in the Skardu-Baltistan region, consistent with the objectives of the Gilgit-Baltistan Forest Act, 2019 (Chapter 3); and tangible community infrastructure benefit through the proponent's CSR programme, most notably the widening and realignment of three bottleneck sections of the Kowardu access road and the purchase of land for formalized community road access (Chapter 6, Section 6.6), corroborated by the land-ownership and consultation record at Chapter 7.

The consultation process documented in Chapter 7 — comprising structured institutional consultation with the Forest, Fisheries, Rescue 1122 and Skardu Development Authority offices, a public hearing at the project site, and environmental baseline sampling — recorded broad community support for the project, reflecting its contribution to local energy access. Certain elements of the consultation record (the precise hearing date, full attendance count, and itemized minutes) remain to be finalized from the field record and annexed prior to submission, as noted in Chapter 7, Section 7.9.

9.2 Overall Conclusion

On the basis of the assessment presented in this report, it is concluded that the proposed project's environmental, social, health and safety impacts can be maintained within acceptable limits, provided that:

1. The Environmental Management Plan (Chapter 6) is implemented in full, including the monitoring programme (Chapter 6, Section 6.8), the sanitation/STP arrangements (Chapter 6, Section 6.5), and the CSR commitments (Chapter 6, Section 6.6);
2. The specialist Quantitative Risk Assessment recommended at Chapter 5, Section 5.5.5 is commissioned and its findings incorporated into the final plant design and separation distances prior to commissioning, consistent with OGRA's technical licensing requirements (Chapter 3, Section 3.6);
3. The Emergency Response Plan (Chapter 8) is finalized — including the muster point layout, mutual-aid arrangement with Rescue 1122, and emergency contact directory — and exercised through the training and drill programme described therein; and
4. The outstanding elements of the public consultation record (Chapter 7) are completed and annexed, and any additional issues raised are incorporated into the final EMP prior to submission to GB-EPA.

Subject to the above, the project is assessed as capable of proceeding in an environmentally responsible manner, consistent with the requirements of the Gilgit-Baltistan Environmental Protection Act, 2014 and the GB-EPA (Review of IEE and EIA) Regulations, 2024, while delivering meaningful positive impact for the Kowardu community and the wider Skardu-Baltistan region through improved energy access, local employment, and reduced pressure on the region's natural forest resources.

9.3 References

This report has been prepared with reference to the following legislation, regulations, standards and guidelines, each discussed in the chapter noted.

Reference	Chapter
Gilgit-Baltistan Environmental Protection Act, 2014	Chapter 3, Section 3.2
GB-EPA (Review of IEE and EIA) Regulations, 2024	Chapter 3, Section 3.3
Pakistan Environmental Protection Act, 1997 and National Environmental Quality Standards (NEQS)	Chapter 3, Section 3.4
OGRA Ordinance, 2002; LPG (Production and Distribution) Rules, 2001; LPG Safety Rules, 2010; OGRA Mandatory Regulatory Criteria for LPG Storage and Filling Plants	Chapter 3, Section 3.5
NFPA 58 (LPG Code)	Chapter 3, Section 3.5; Chapter 5, Section 5.5.5
Gilgit-Baltistan Forest Act, 2019; Forest Act, 1927	Chapter 3, Section 3.6.1–3.6.2
Antiquities Act, 1975	Chapter 3, Section 3.6.3
Gilgit-Baltistan Development of Cities Act, 2020	Chapter 7, Section 7.3.4
Guidelines for the Preparation and Review of Environmental Reports; Guidelines for Public Consultation; Guidelines for Sensitive and Critical Areas (GB-EPA-adopted)	Chapter 3, Section 3.3.3; Chapter 7
Project feasibility and cost estimate, M/S Kazmi Engineering (Ref. KE-1882-1, dated 25 July 2026)	Chapter 2, Section 2.11
Assistant Commissioner, Gamba correspondence (Ref. SDG-JC-8(2)/2022, dated 22 July 2026)	Chapter 3, Section 3.6.5; Chapter 7, Section 7.3.5

9.4 Index of Annexures

The following annexures accompany this report. Items marked "Attached" are included with this version of the report; items marked "Pending" are to be finalized and appended by the proponent/EIA consultant prior to submission to GB-EPA, as identified throughout this report.

Annexure	Description	Status	Referenced In
A	Site layout plan (Kazmi Engineering)	Attached	Chapter 2, Section 2.4
B	Legal documents — land ownership (sale deed / Baye Nama, mutation report, register-of-mutations extract)	Attached	Chapter 7, Section 7.6
C	Assistant Commissioner, Gamba — NOC correspondence (Ref. SDG-JC-8(2)/2022)	Attached	Chapter 3, Section 3.6.5; Chapter 7, Section 7.3.5
D	Project feasibility / itemized cost estimate (Kazmi Engineering, Ref. KE-1882-1)	Attached (summarized in Chapter 2; full itemized estimate held by proponent)	Chapter 2, Section 2.11
E	Photographic record — line department consultations, public hearing, and baseline sampling	Attached	Chapter 7
F	Public hearing — signed attendance register and detailed minutes	Pending	Chapter 7, Section 7.4
G	Baseline monitoring laboratory certificates — air, noise, soil, water	Pending	Chapter 4, Section 4.4
H	CVs of the EIA study team	Pending	Chapter 1, Section 1.9
I	Departmental correspondence — Forest, Fisheries, Rescue 1122, SDA, Union Council	Partially attached (see Chapter 7); remaining written correspondence pending	Chapter 7, Section 7.3
J	Site photographs — project site, vegetation, plant/construction progress	Partially attached (Chapter 4, Chapter 6); additional site photographs pending	Chapter 4; Chapter 6
K	Site-specific Quantitative Risk Assessment (QRA)	Pending — to be commissioned per Chapter 5, Section 5.5.5	Chapter 5, Section 5.5.5

9.5 Certification

This report has been prepared by Eco Solution and Services Pvt Ltd on the basis of information provided by the proponent, published secondary data, and the field survey, monitoring, and consultation record described herein, to the best professional knowledge and judgement of the study team identified at Chapter 1, Section 1.9.

	Name / Designation	Signature	Date
Prepared by (EIA Consultant)	Mr. Ehsan Ali, Project Leader - Eco Solution & Services Pvt Ltd.		
Reviewed by (EIA Consultant)	Dr. Attarad Ali – Environmentalist - Eco Solution & Services Pvt Ltd]		
Submitted by (Proponent)	Mr. Moazzam Saghir, CEO, Al Debaran Energy Private Limited		

This report is submitted to the Gilgit-Baltistan Environmental Protection Agency for review and environmental approval in accordance with Section 16 of the Gilgit-Baltistan Environmental Protection Act, 2014 and the GB-EPA (Review of IEE and EIA) Regulations, 2024.

ANNEXURES

Feasibility LPG Plant Installation 2x50 M Ton Capacity at SKARDU

The LPG Plant is developed by M/S Kazmi Engineering they will executed the job for providing Consultancy, designing, planning, fabrication, welding, i.e complete installation of LPG Plant

S/No	Description	Amount Rs.
1	**LPG PUMP 2 Nos.** • Self-priming side channel pump set Model No. 5106 PUMP RPM 1450, DIN flanges Suction 4" and Discharge 2" • 20 Hp Motor, II 2G Ex e II T3-T4 flame proof/ Explosion proof, 50/60 Hz Three Phase induction explosion proof motor • Other Details LPG Pump coupled with motor on base plate	**590,000**
2	**LPG Compresser 1 Nos.** Model TEK-491 Make Petrotek China Motor 11 KW	**265,500**
3	**LPG FILLING MACHINES 6 Nos.** **Auto Filling Asian Scale Pak Made**	**1,416,000**
4	**LPG NETWORK** • MS Pipe 2"&4" Seamless SCH. 40 API 5L Gr. B • MS Flange 2"&4" WNRF 300 Class • MS Tee 2"&4" SCH. 40	**2,000,000**

	• MS Bend 2"&4" SCH. 40 • MS Ball Valve 2"&4" Class 300 Flanged Gr. WCB • Pneumatic Actuators with Ball Valve Class 300 • MS Socket ASTM A-105, 3000 • MS Studs, Nuts, as per ANSI B 16.5 Gr. B • MS Strainer 4" Y-Type, Class 300 • MS NRV 2" Class 300 • MS Channel 2" • U-Clamp Galvanized 2"&4" • Pressure Gauge 4" Dial • Temperature Guage. • Pull Away Coupling 2” • Hose Pipes for Bowser loading / unloading	
5	**AIR COMPRESSOR** • Air Compressor 5 HP for Pneumatic Actuators, Filling Machines and ESD System • Pneumatic Piping are not included.	**40,000**
6	**FIRE FIGHTING NETWORK MATERIAL** Fire Water Distribution System include, • MS Pipe 2"&4"SCH. 40 • MS Flange 2"&4" Slip-on 150 Class • MS Tee 2"&4" SCH. 40 • MS Bend 2"&4" SCH. 40 • MS Ball Valve 2"&4" Class 150 Flanged • MS Needle Valve ½” • MS Swedge Nipples ASTM A-105, 3000 ANSI • MS Socket ASTM A-105, 3000 • MS Studs, Nuts, as per ANSI B 16.5 Gr. B • Automatic and manual Showers	**1,000,000**

7	**FIRE FIGHTING EQUIPMENT** **Fire Hydrants 4 Nos** 2.5" dia, Surface type Brass **Fire Hose Cabinet 4 Nos** 24"x24"x9" Glass front, made of mild steel Red painted, Floor Mounted with Stand Powder Baked Paint. **Fir Fighting Hose 4 Nos** 2.5" Dia, high pressure, 350 psi Working Pressure, 600 psi Bursting Pressure Nylon top rubber lined OSW Germany C/w Male & Female Brass Couplings 30 meter length. **Fire Fighting Nozzle 4 Nos** TP-300 High Discharge jet/spray/fog Designed for LPG Application. **Fire Water Monitors. 4 Nos.** SB-2500 **Buckets Stand for sand& water 4 Nos** 4 buckets each **DRY CHEMICAL POWDER** portable 12 Kg Capacity Chinese Base Powder **TROLLEY MOUNTED 25 KG** Trolley Chinese Base	**1,250,000**
8	**SHOWERING PUMPS** • Jockey Pump for fire system Pressure maintain • Showering Pump 200 GPM with 20 HP Motor	**129,800** **241,900**

9	**<u>FIRE PUMP 500 GPM</u>** Brand New UL Listed Diesel Engine operated Firepump, EHF53250 series, 500GPM @ 8 bars coupled with 61kW UL Listed Diesel Engine and supplied with Brand new UL/FM Approved Tornatech Diesel Engine controller. Pump brand; Eifel China Engine; Taidong China Controller; Tornatech UAE	**619,500**
10	**<u>CERTIFICATES</u>** • Calibration certificates of gauges, safeties, etc. • Radiography testing and reports of piping. • Hydro Testing Piping of LPG • Hydro Testing Piping of Water	**200,000**
11	**<u>LPG GAS DETECTOR</u>** • Supply of Gas Detection system with 3 sensors at LPG Tank Area, Pump Area and Bowser Point Loading / Unloading Area.	**180,000**
12	**<u>PAINT WORKS</u>** • Painting of all LPG Lines with fittings. • Painting of all water lines with fittings. • Painting of LPG Tanks, Railings, Stairs, etc	**200,000**
13	**LABOUR** Labour charges for fabrication, Welding and installation, etc • Labor for LPG Piping • Labor for Fire water network	**1,500,000**

	• Labor for Electric works	
14	**SAFETY MATERIAL REGO IMPORT**	**5,000,000**
15	**ELECTRIC**	**2,200,000**
16	**CIVIL WORKS**	**21,000,000**
17	**LPG TANKS 2x50 MT**	**16,000,000**
	Total Amount	**56,032,700**

Figure 2 LEGAL DOCUMENTS RELATED TO THE PROJECT

NO.SDG-JC-8(2)/2022
GOVERNMENT OF GILGIT BALTISTAN
OFFICE OF THE ASSISTANT COMMISSIONER GAMBA SKARDU

Dated 22nd July. 2026

To,

The Deputy Commissioner,
Skardu.

Subject: **REQUEST FOR PROVISION OF NOC FOR CONSTRUCTION OF LPG STORAGE & FILLING PLANT AT DISTRICT SKARDU.**

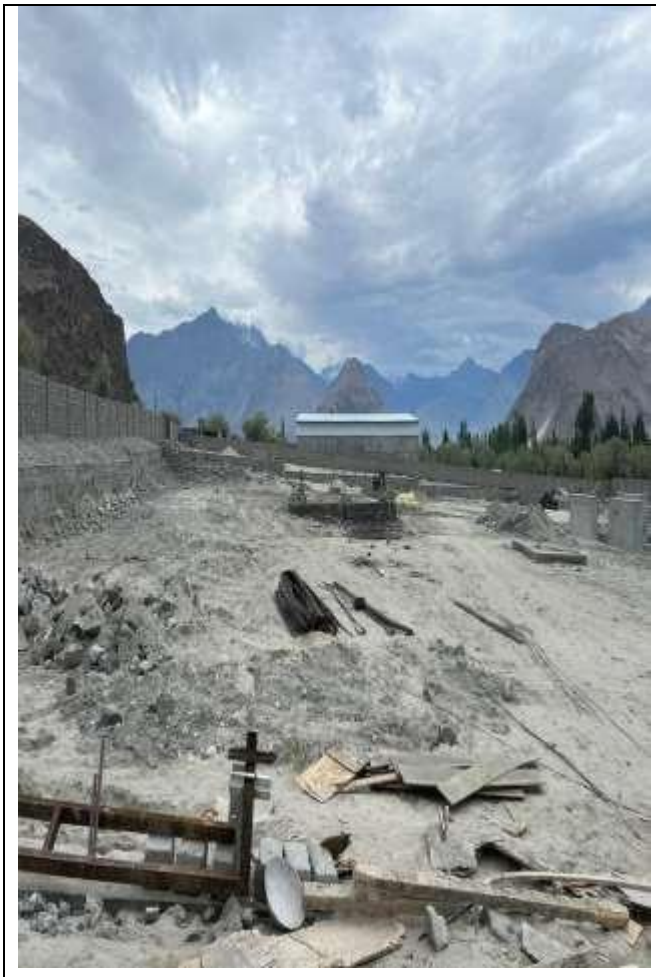
Kindly refer to your letter No. Mil-1(8)/2014-III dated nil on the subject cited above.

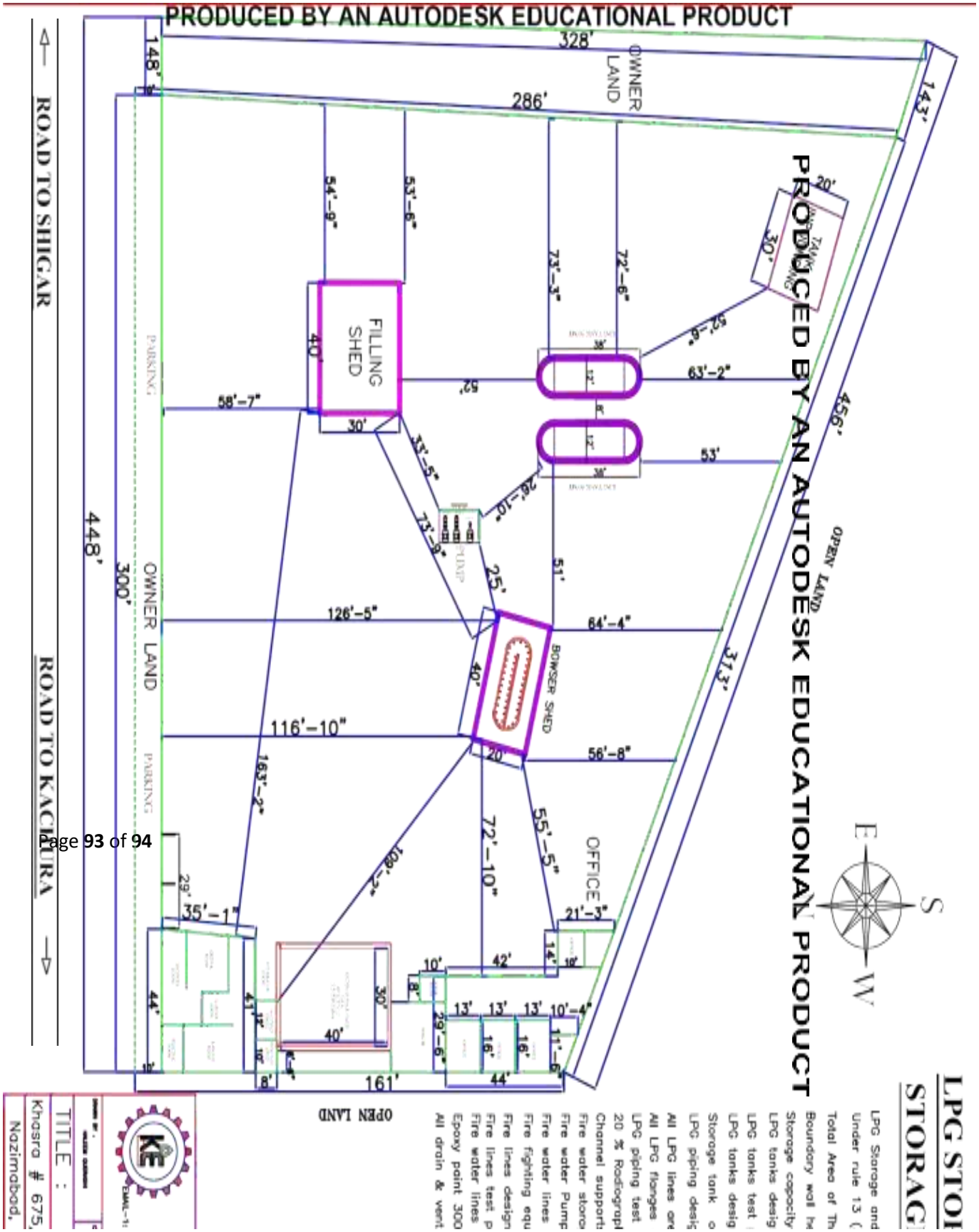
In this regard it is submitted that as per report of Tehsildar, Gamba land measuring 21 kanal 11 Marlas under Mutation No.673 is owned by MR. Muazzam Sagheer S/O Sagheer Ahmed Khan R/O Nazim-ud-Deen road House No.410 sector F-11/1, Islamabad. The said land situated at main road of Kowardo Shigar. There is no any construction exist at present. Report of Tehsildar, Gamba is enclosed for ready reference and further necessary action. Please.

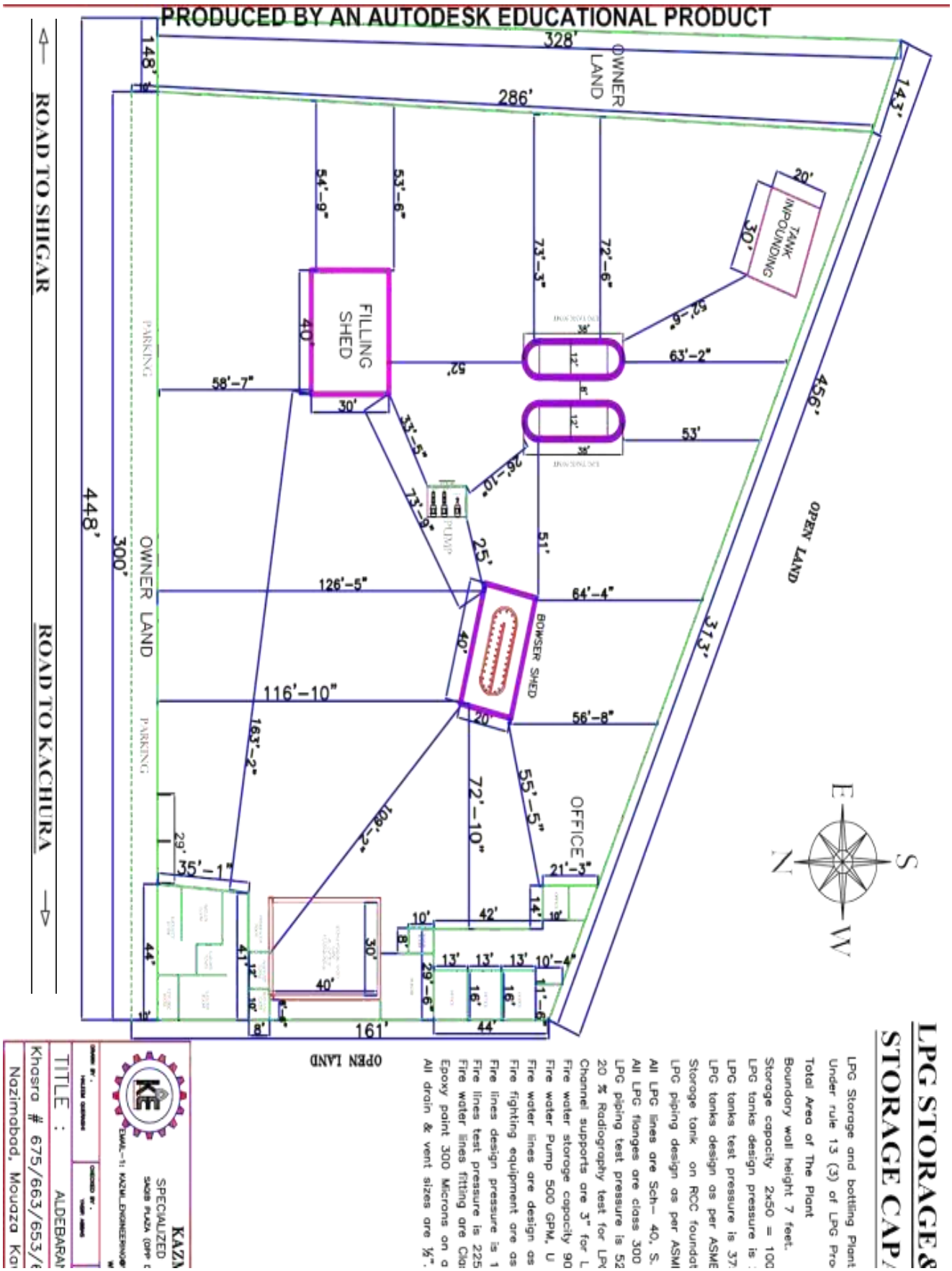
ASSISTANT COMMISSIONERGAMBA

Issued
23-7-26

Figure 3 Show the project sites






PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT
ROAD TO SHIGAR
ROAD TO KACHURA
OWNER LAND
OPEN LAND
FILLING SHED
TANK INPOUNDING
BOWSER SHED
PUMP
OFFICE
PARKING
328'
286'
448'
300'
161'
143'
456'
313'
148'
LPG STORAGE &
STORAGE CAPA
LPG Storage and bottling Plant
Under rule 13 (3) of LPG Pro
Total Area of The Plant
Boundary wall height 7 feet.
Storage capacity 2x50 = 100
LPG tanks design pressure is
LPG tanks test pressure is 37
LPG tanks design as per ASME
Storage tank on RCC foundat
LPG piping design as per ASMI
All LPG lines are Sch– 40, S.
All LPG flanges are class 300
LPG piping test pressure is 52
20 % Radiography test for LP
Channel supports are 3" for L
Fire water storage capacity 90
Fire water Pump 500 GPM, U
Fire water lines are design as
Fire fighting equipment are as
Fire lines design pressure is 1
Fire lines test pressure is 225
Fire water lines fitting are Cla
Epoxy paint 300 Microns on a
All drain & vent sizes are ½".
KAZM
SPECIALIZED
TITLE :
ALDEBARA
Khasra # 675/663/653/
Nazimabad, Mouaza Ka