

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

ESTABLISHMENT OF GUL SAHIB HOSPITAL, TULAMBA TEHSIL MIAN CHANNU, DISTRICT KHANEWAL



June, 2026



SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

LAHORE

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ES. EXECUTIVE SUMMARY

The proposed project, Gul Sahib Hospital, is a sole proprietorship venture of Dr. Muhammad Aslam Nasir, who plans to establish a 250-bed general hospital in his hometown near Mian Channu. Driven by a commitment to serving his native community, Dr. Nasir aims to provide comprehensive and quality healthcare services under one roof. In addition the project is expected to generate local employment opportunities and contribute to the socio-economic development of the region.

ES. 1 PROJECT TITLE

Establishment Of Gul Sahib Hospital, Tulamba Tehsil Mian Channu, District Khanewal

ES.2 LOCATION

Tulamba Tehsil Mian Channu, District Khanewal

ES.3 PROPONENT

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ES.4 ENVIRONMENTAL CONSULTANT

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ES.5 OUTLINE OF THE PROJECT

ES. 5.1 TYPE OF THE PROJECT

The proposed project entails the development of a 250-bed General Hospital in Tulamba, Tehsil Mian Channu. The facility will comprise a main building consisting of a basement, ground floor, four upper floors and Mumty. The hospital will provide a comprehensive range of healthcare services through key departments including Emergency, Outpatient Department (OPD), Diagnostics, Gynecology, Oncology, Inpatient Wards, Intensive Care Unit (ICU), Coronary Care Unit (CCU), and Operation Theatres, among others.

According to Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022, Project for Hospital of 250 beds falls in Schedule II-H (3) categorized for Hospitals having more than 50 beds requiring an Environmental Impact Assessment (EIA).

ES 5.2 PROCESS AND TECHNOLOGY

Healthcare Services and Operational Processes

The hospital will provide a wide range of healthcare services including Emergency Services, Outpatient Department (OPD), Inpatient Wards, Intensive Care Unit (ICU), Coronary Care Unit (CCU), Gynecology and Obstetrics, Oncology, Operation Theatres, Laboratory Services, Diagnostic Imaging, Pharmacy, Physiotherapy, and other allied healthcare services.

The operational process will generally involve patient registration, clinical consultation, diagnostic investigations, treatment and medication, surgical interventions where required, inpatient care, and discharge management. Emergency services will operate on a 24-hour basis to provide immediate medical care to patients.

Diagnostic and Medical Technology

The hospital will utilize modern medical equipment and healthcare technologies for diagnosis and treatment. Major equipment is expected to include:

- Digital X-Ray systems
- Ultrasound machines
- CT Scan and other imaging equipment (if installed)
- Laboratory analyzers
- Patient monitoring systems
- Ventilators
- Anesthesia machines
- Operation theatre equipment
- ICU and CCU monitoring equipment
- Medical gas distribution systems

All medical equipment will be procured from approved manufacturers and operated by trained healthcare professionals in accordance with applicable healthcare standards.

Salient features of the proposed project are summarized in Table ES-1.

Table ES.1: Overview of Gul Sahib Hospital

1.	Project Nature	General Hospital
2	Total No. of beds	250
3	Total Land	21 Kanal 8 Marla (116,419 sq. Ft)
4	Total Covered Area	191,564 sq. Ft (all floors)
5	Estimated Project Cost	PKR. 1.2 Billion
6	Floors	Basement, Ground Floor, 4 Upper Floors, Mumty

		Services
	Basement (34688 sq. Ft)	• Radiology: X-Ray, Fluoroscopy, Mammography, CT Scan, MRI Room, Ultrasound rooms with consoles • Diagnostics passage, Blood Bank, Laboratory Hall • Water tanks: OHWT (firefighting & drinking), UGWT (firefighting & drinking) • Septic tank, rainwater tank • Laundry, Workshop, Kitchen, Kitchen Store • Prayer areas – men's (72 persons), women's (36 persons)
	Ground Floor (34908 sq. Ft)	• Emergency, Triage, Resuscitation, Isolation Rooms • OPD, Dental Rooms, Doctor Rooms, Pharmacy • Admin Office, Reception, Central Atrium (Sitting Area / Void) • Flower Shop, Tuck Shop, Kitchen, • Sample Collection, Plaster Room
	1 st Floor (33731 sq. Ft)	• Eye Ward, ENT Ward, Orthopaedic Ward, Thalassemia Ward, Artificial Limbs section • Telemedicine Room • VIP/General Patients Rooms • Pharmacy, Nursing Lounge, Admin Areas, Director's Office • Record Room, Computer/Data Room, Meeting Room • Library, Auditorium
	2 nd Floor (31747 sq. Ft)	• Medical ICU, Surgical ICU, Paediatric ICU • High Dependency Unit (HDU) Ward • Surgical Ward, Gynae Ward, Medical Ward, Paediatric Ward • Pantry, Kitchen, Store rooms
	3 rd Floor (32740 sq. Ft)	• Operation Theatres OT.1–OT.4, Recovery • Anaesthesia room, • Labor Rooms, Delivery Rooms, Well Baby Nursery • Obstetrics/Gynae, Resuscitation, COVID Room • Cardiotocography (CTG) Room, Pelvic Room, Ultrasound Room
	4 th Floor (23387 sq. Ft)	Staff Hostel
	Mumty (363 sq. Ft)	• Overhead Water Tank (OHWT) for firefighting – 30,608 gallons (UK) • OHWT for building/domestic use – 30,608 gallons (UK)
B.	Project Design	
	Architect	M/s Design Matrix
	Detailed designing and Construction	M/s Design Matrix
	Main Design Code	FGI-2018 (Facility Guideline Institute for design and construction of

		Healthcare Facilities
C.	Utilities Requirement	
	Water	Groundwater from Tube well Pumps 20 m3 per day (During Construction) Total 100 m3 per day (During Operational phase)
	Electricity	Electricity demand = ---- kW; MEPCO (WAPDA) power supply with an alternate emergency source of diesel generators ----- kW
	Medical Gas System	A centralized medical gas distribution system will be installed to supply oxygen, medical air, vacuum, and other medical gases to critical care areas including ICUs, operation theatres, emergency rooms, and patient wards
D.	Waste Handling (Operational Phase)	
	Biomedical Waste (Hazardous Waste)	250 kg/day, To be disposed of through EPA approved contractor
	Non-Hazardous Waste	Non-Hazardous (MSW) = 200 kg/day To be disposed of through MC Mian Channu
	Wastewater	- Wastewater = 50 m3 per day (during operational phase) - Design capacity of Effluent Treatment Plant (ETP) = 60 m3 per day - Wastewater will be treated in ETP before discharge - Pretreatment of influents from Pathological Labs and Nuclear Medicine Labs before disposal to External Drain.
E.	Workforce	
	Construction Phase	Labor force = 50-60
	Operational Phase	Staff 200
F	Fire fighting	The Fire Protection and Life Safety System shall be installed including fire hydrants, fire sprinklers, smoke & heat detectors, fire extinguishers, etc. along with 30,608 Imperial gallons firewater storage.

ES. 5.3 Land for Proposed Project

The proponent has legally owned land of 21 Kanal 8 Marla and total covered area of 191,564 sq. Ft (all floors) located at Tulamba, Tehsil Mian Channu, District Khanewal.

ES. 6 MAJOR IMPACTS

The following is a summary of the expected impacts associated with the preconstruction, construction, and operating phases of the proposed project:

ES 6.1 Preconstruction Phase Impacts

Project Location/Land Acquisition/Resettlement

No negative impact is expected associated with Project Location or Land acquisition as the proponent has legally owned land for the proposed project. No resettlement is involved. No protected or sensitive area is nearby. Essential utilities such as electricity and groundwater are readily available. The site is easily accessible through the national road network.

Furthermore, the project is expected to generate significant positive socio-economic and healthcare benefits, as the neighboring communities and the wider population of Tehsil Mian Channu will gain improved access to quality medical and emergency healthcare services through Gul Sahib Hospital.

Design

Appropriate design has positive impact as it prioritizes enhancing safety, environmental sustainability, plant integrity, maintenance efficiency and seamless operation of the proposed project while considering site's seismic zone, comply with international design standards, incorporate emergency exits, ensures an optimized layout and address other pertinent design factors. High efficiency and clean environment should be considered during all equipment selection and procurement of chemicals.

ES 7.2 Construction Phase Impacts

Noise: Hearing loss and other physical and psychological issues - Noise Caused by Construction Machinery, Construction activities, Generators, Material/Plant Machinery transportation and installation, Misuse of mobile.

Dust emissions: Health hazard – Emissions Caused by Excavation, Construction material handling and storage, Vehicles' movement on soft soil.

Air Emissions: Health and Environment Damage - Gaseous emissions from Construction machinery, equipment, vehicles and diesel generators.

Soil Erosion: Safety Hazard - Mainly by excavation, trees removal

Soil Contamination and Water contamination – Caused by improper Solid and Liquid Waste Management; leakages of oil and fuel from poorly maintained machinery and vehicles, spillage of chemicals, oil and fuel during handling and storage.

Water Supply: Poor water quality and inadequate supply can result in health hazards and sanitation issues

Solid Waste Management – Poor waste management can lead to air pollution, water and soil contamination and disease transmission.

Wastewater Management - Improper management can cause health hazards and ecological disruptions.

Occupational Health and Safety: All Construction Activities may impact on Occupational health and safety of workers

Traffic Congestion; Safety Hazard for community- Construction Material and Plant equipment transport

Socio-economic Impacts: Positive impact through job creation and business expansion for local community.

Biological Impact: Negative impacts on the environment and ecosystems caused by the clearing of trees and vegetation.

ES 7.3 Operation Phase Impacts

Noise: Hearing Loss, physical and psychological impact, Sometimes it may cause safety hazard. Source - High Noise from Operation machinery, Emergency Generators.

Air Emissions: Air quality deterioration. Mainly gaseous emissions and Particulates, causing health and environmental harm, originating from the stack of diesel generators. Indoor air quality (IAQ) can be affected by a variety of emissions originating from medical activities, building systems, cleaning operations, and occupants.

Poor Solid Waste Management: Soil and water contamination, along with financial losses from excessive waste in the absence of proper solid waste management.

Poor Wastewater Management: Soil and groundwater contamination, health risks, unpleasant odors, excessive discharges into external drains, penalties, and potential business closure due to non-compliance with PEQS.

Soil Contamination and Water contamination: Soil and water contamination by improper handling of healthcare waste, laboratory chemicals, wastewater, pharmaceuticals and fuel storage facilities and uncontrolled leakages/spillages of chemicals/oils

Occupational Health and Safety: Operation activities may lead to safety incidents and health risks. Handling and storage of chemicals, oils may also pose health and safety risks.

Traffic: Traffic congestion and Safety Risk due to increased vehicle/ambulance movements during peak traffic hours, higher parking demand. Temporary congestion at hospital entrances.

ES .6.4 Positive Impacts

Socio-economic Impacts: Improved access to healthcare services for local residents. Have positive impact by creating jobs, and offering opportunities for business growth within the local community

Change of Land Use: A positive impact is anticipated as the land will be utilized for a productive purpose by addressing the existing gap in healthcare facilities.

ES 7. RECOMMENDATIONS FOR MITIGATION MEASURES

ES 7.1 Proposed Mitigations for Construction Phase

Noise:

- Ensure well maintained and low noise construction machinery and equipment.
- Address Noise hazards in accordance with "OSHA Standards for Construction".
- Fit an acoustic enclosure if machine is stationary.
- Install canopies and silencer on standby generator.

- Ensure use of PPEs such as ear plugs and ear muffs in areas with high noise level
- Place Sign boards in areas with loud noise levels
- Ensure to switch off all equipment when not in use.
- Keep the music volume of radio or mobile phone down
- Regular monitoring and control of Noise level.

Dust Emissions:

- Minimize dust emissions by wet suppression – Use water sprays at appropriate frequency. Use water sprinkler system.
- Cover open stockpiles of construction materials with tarpaulin.
- Cordon off project area to minimize dust migration to nearby facilities
- Carry out Site Restoration as early as feasible.
- Provide PPEs – masks etc. to the workers

Air Emissions:

- Ensure exhaust emissions from construction machinery and equipment, Generators to comply with PEQS for exhaust emissions; Ensure maintenance of Construction machinery.
- Use power supply preferably from Wapda during Construction phase to avoid gaseous emissions from diesel generators.
- Avoid open burning of solid waste

Soil and Water Contamination:

- Ensure appropriate solid waste management
- Ensure proper wastewater management
- Conduct regular and proactive maintenance of all machinery, vehicles, and generators to ensure they remain free of leaks.
- Verify the roadworthiness and fitness of material transportation vehicles.
- Conduct daily inspections of the construction site to identify any leaks or spills of oil, fuel, or chemicals.
- Designate specific areas for vehicle washing and servicing to prevent soil contamination.

Water Supply

- Ensure sufficient supply of groundwater that meet PEQS of drinking water.
- Arrange groundwater analysis by EPA certified Lab on quarterly basis.
- Avoid wastage of water.

Solid Waste Management

- Develop a comprehensive Solid Waste Management Plan and ensure its strict implementation.

Wastewater Treatment

- Install new sewerage lines at construction site and construct a septic tank for holding wastewater before disposal to external drain.

Occupational Safety and Health

- Establish and enforce procedures in compliance with Occupational Safety and Health Administration (OSHA) standards
- Provide fire extinguishers and other firefighting equipment at sensitive places.
- Provide first aid boxes at suitable locations of the site.
- Communicate safety hazards with adequate signage.
- Use SOPs of Department of Health, Govt. of Punjab for prevention and control of dengue.

Traffic

- The existing roads can accommodate the increased traffic from new developments.
- Trucks entering and leaving the mill gate should be supervised by security personnel.
- Avoid material and plant machinery transportation during peak traffic hours.
- Ensure that all drivers entering the hospital premises possess a valid driving licence.

Socio-economic Impacts

- The majority of unskilled jobs shall be allocated to members of the local community.

Biological Impact

- Tree cutting or removal is prohibited without permission from relevant departments. However, no tree cutting is involved during construction phase.
- Additionally, undertake extensive plantation and develop landscaped areas at the Project site.

ES 8.3 Proposed Mitigations for Operational Phase

Noise

- Install low noise machinery to comply with PEQS of noise.
- Perform regular maintenance of machinery and promptly identify and repair faulty equipment to address noise issues.
- Install acoustic enclosures for stationary equipment.
- Install silencer and canopy at the standby generators.
- Deploy noise barriers where necessary.
- Monitor noise level on regular basis. Place Sign boards in areas with loud noise levels.
- Ensure the use of hearing protection, such as earplugs, earmuffs when needed.

Dust Emissions

- Local exhaust or extraction system are installed at dust generating operations.
- Appropriate ventilation systems have been installed to ensure clean indoor air quality.
- Undertake restoration as soon as possible and either develop landscapes or cover the open area with concrete pavement.
- Provide PPEs to workers and ensure their use.
- Vehicle speed within the facility should be limited to 20 km/h,
- Water spraying should be used to control dust from unpaved access roads and areas.
- Regular monitoring of indoor air quality will be carried out.

Air Emissions

- Normal power supply will be from Wapda resulting in minimal emissions at site from power generation. Diesel generators will be well maintained and operated only for emergency generation.
- Appropriate engineering controls, including mechanical ventilation systems, HEPA (High-Efficiency Particulate Air filtration) filtration, negative-pressure isolation rooms, anesthetic gas scavenging systems, and regular maintenance of HVAC systems, will be implemented to maintain indoor air quality within acceptable healthcare standards and protect the health of patients, visitors, and staff.
- As hazardous waste incineration will be carried out at the Contractor off-site facility, therefore, preventing air quality deterioration from exhaust pollutants of incinerators.
- Undertake restoration as soon as possible and either develop landscapes or cover the open area with concrete pavement.
- Provide PPEs to workers and ensure their use.
- Vehicle speed within the facility should be limited to 20 km/h,
- Water spraying should be used to control dust from unpaved access roads and areas.
- Regular monitoring of indoor air quality will be carried out.

Hospital Waste Management

- Develop and Implement Hospital waste management plan for the Operational phase following clauses of **Punjab Hospital Waste Management Rules 2014**.
- Prepare and implement Radioactive Waste Management Plan according to PNRA's Regulations on Radiation Protection (PAK/904) and international guidelines on radiation protection and safety standards.
- Segregate the waste at source.
- Prepare and implement following Policies in line with Punjab HWM Rules 2014
 - Hazardous Material and Waste Management
 - Waste Disposal
 - Infection Control Manual
- EPA certified Waste Handling Contractor to dispose of hospital Hazardous Waste.
- All waste will be protected from theft, vandalism, or scavenging by persons or animals. Arrange training, refresher courses on hospital waste management, and establish an HSE audit system.
- Dispose of nonhazardous and domestic solid waste through MC Mian Channu.

Wastewater Management

- Treat effluent through Effluent Treatment Plant (ETP) before disposal.
- Reduce to an absolute minimum the presence of antibiotics and pharmaceutical residues in wastewater; Cytotoxic waste should not be discharged to a wastewater stream.
- Establish plan for wastewater minimization
- Segregate non-contaminated wastewater streams from contaminated streams.
- Treated effluent will be monitored on quarterly basis to ensure compliance with the relevant PEQS.

- Spills and leakages shall be promptly contained and cleaned with minimal mixing into wastewater flowing towards ETP.
- Ensure Segregation, waste minimization, and safe storage for liquid wastes as for solid wastes.
- It will be ensured that the discharge after passing through the septic pond/ Wastewater Treatment Section complies with relevant PEQS.
- Wastewater from Pathological Labs and Nuclear Medicine Labs shall be pretreated before disposal to Sewers after compliance with PEQs for liquid stream generated from the Hospitals and WHO/IFC guidelines limits.
- Install grease traps for the kitchen wastewater and clean regularly.
- Arrange cleaning of septic tanks regularly.
- Sludge removed from ETP shall be disposed of through EPA approved contractor.
- Restrict entry of solid waste into the wastewater stream
- Regularly inspect the sewerage system and repair when necessary.

Water Supply

- Ensure sufficient and clean water supply for the operation phase that meets PEQS of drinking water.
- Conserve water, Recycle process water
- Monitor groundwater quality for relevant PEQS parameters.

Socio-economic Impacts

- The majority of unskilled jobs shall be allocated to members of the local community. For semi-skilled positions, academically qualified individuals from the local community will be recruited and given appropriate training.

Biological Impacts

- Undertake extensive plantation and develop landscaped areas at the Project site, ensuring regular follow-up to support tree growth.

Occupational Safety and Health

- Hospital Safety Management Plan will be prepared with measures to protect workers during emergencies, non-routine, and routine activities.
- HSE Policy shall be prepared and implemented.
- Ensure proper hazardous waste management to avoid occupational injuries and illness. (Following clauses of **Punjab Hospital Waste Management Rules 2014.**)
- Enforce the use of PPEs.
- Communicate safety and health hazards with adequate signage,
- Timely reporting of hazards and near-misses shall be established.
- Periodic Safety audits shall be conducted.
- Prepare an MSDS database for all the material or chemicals used at Hospital. It should be available all the time for the employees involved in handling or procurement of these chemicals.

- Protocol for incident reporting and incident investigation should be developed. Accordingly, the waste management plan may be updated and revised to prevent the recurrence of incidents.
- Fire-fighting systems including fire hydrants, fire extinguishers, sprinklers, and smoke detectors shall be installed.
- Ensure awareness to permanent and contract employees for potential safety and health hazards associated with chemicals, drugs, gases, radiation, hospital waste, and wastewater, and other material used at Hospital.
- Train workers on safe work practices, specific hazards associated with their job description, basic first aid, fire prevention, and firefighting.
- Emergency Response Plan (ERP) including evacuation plan shall be developed and implemented to address any fire, explosion, spillage of chemicals or waste, exposure to gases or radiation, and any safety or security incident or accident.
- Conduct drills for preparation of disaster management and emergency response preparedness.

ES 8. PROPOSED MONITORING

Gul Sahib Hospital has engaged third party EPA certified Lab to perform proposed monitoring according to the parameters and frequency suggested in Table ES-1 and/or advised by EPA.

Table ES-1: Environment Monitoring Plan for Construction and Operational Phases

Components	Parameters (PEQS Compliance)	Remarks	Frequency	
			Construction	Operations
Noise	Noise Level dB(A) (PEQS)	PEQS Compliance	Quarterly	Quarterly
Ambient Air Quality	CO, *SO ₂ , NO _x , Particulates (PM ₁₀ , PM _{2.5}) (PEQS)	PEQS For Ambient Air	Quarterly	Quarterly-
Gaseous Emissions	CO, SO ₂ , NO _x , Particulates	PEQS for Industrial Gaseous Emissions	Quarterly	Quarterly
Water Quality	Drinking water PEQS	PEQS for Drinking water	Quarterly	Quarterly
Effluent	Flow, T, pH, COD, BOD ₅ , TSS, Oil and grease	PEQS for Industrial Effluents	Quarterly	Quarterly
Trees Plantation	Visual Inspection	Environmental Sustainability	Regular Monitoring by Site Management.	

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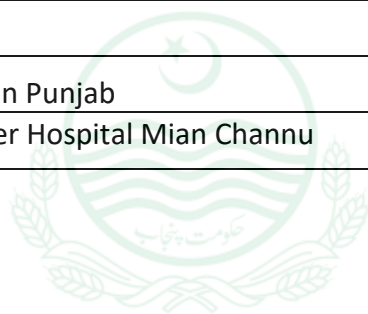
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1. INTRODUCTION

The proposed project, Gul Sahib Hospital, is a sole proprietorship venture of Dr. Muhammad Aslam Nasir, who plans to establish a 250-bed general hospital in his hometown near Mian Channu. Driven by a commitment to serving his native community, Dr. Nasir aims to provide comprehensive and quality healthcare services under one roof. In addition the project is expected to generate local employment opportunities and contribute to the socio-economic development of the region.

1.1 PURPOSE OF THE EIA REPORT

The preparation and submission of an Environmental Impact Assessment (EIA) Report for any development project is a legal requirement under the Punjab Environmental Protection Act, 1997 (PEPA, 1997), as amended in 2012, 2017, in accordance with Section 12 of the Act.

This report aims to seek Environmental Approval from EPA Punjab for the project titled "Establishment Of Gul Sahib Hospital, Tulamba Tehsil Mian Channu, District Khanewal" over a total land of 21 Kanal 08 Marla.

1.2 IDENTIFICATION OF PROJECT, PROPONENT AND CONSULTANT

The proposed project entails the development of a 250-bed General Hospital in Tulamba, Tehsil Mian Channu. The facility will comprise a main building consisting of a basement, ground floor, and four upper floors. The hospital will provide a comprehensive range of healthcare services through key departments including Emergency, Outpatient Department (OPD), Diagnostics, Gynecology, Oncology, Inpatient Wards, Intensive Care Unit (ICU), Coronary Care Unit (CCU), and Operation Theatres, among others.

According to Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022, Project for Hospital of 250 beds falls in Schedule II-H (3) categorized for Hospitals having more than 50 beds requiring an Environmental Impact Assessment (EIA).

1.2.1 Proponent

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

The proposed project involves the establishment of a 250-bed General Hospital to be located at Tulamba–Mian Channu Road, Tulamba, Tehsil Mian Channu, District Khanewal, Punjab. The project is being developed to provide quality healthcare facilities to the local population and surrounding communities, addressing the growing demand for modern medical services in the region.

The project aims to improve access to healthcare, reduce patient travel to distant urban centers, and enhance the overall health infrastructure of Tehsil Mian Channu and adjoining areas. The proposed hospital will operate in compliance with the applicable requirements of the Punjab Healthcare Commission (PHC) and other relevant regulatory authorities.

Total Land = 21 Kanal 08 Marla

Hospital Building: consisting of a basement, ground floor, 4 upper floors and Mumty

Total Covered area = 191,564 sq. Ft (all floors)

Major Departments: Emergency, Outpatient Department (OPD), Diagnostics, Gynaecology, Oncology, Inpatient Wards, Intensive Care Unit (ICU), Coronary Care Unit (CCU), Operation Theatres, Pharmacy, Laboratory, and other allied healthcare services.

Hospital Waste Management: In line with Punjab Hospital Waste Management Rules 2014.

Wastewater Management: An Effluent Treatment Plant of 60 m³ per day will be installed

Estimated Project Cost: PKR 1.2 Billion

1.3.1 Location and the Surroundings

The project site is located at Chak 14/8 R, along Tulamba – Mian Channu Road in Tehsil Mian Channu, District Khanewal, Punjab. The hospital is around 6-7 Km from Mian Channu.

The coordinates of project site are - Latitude 30.475437° Longitude 72.320395° whereas the location of the project is illustrated in Figure 1.1.

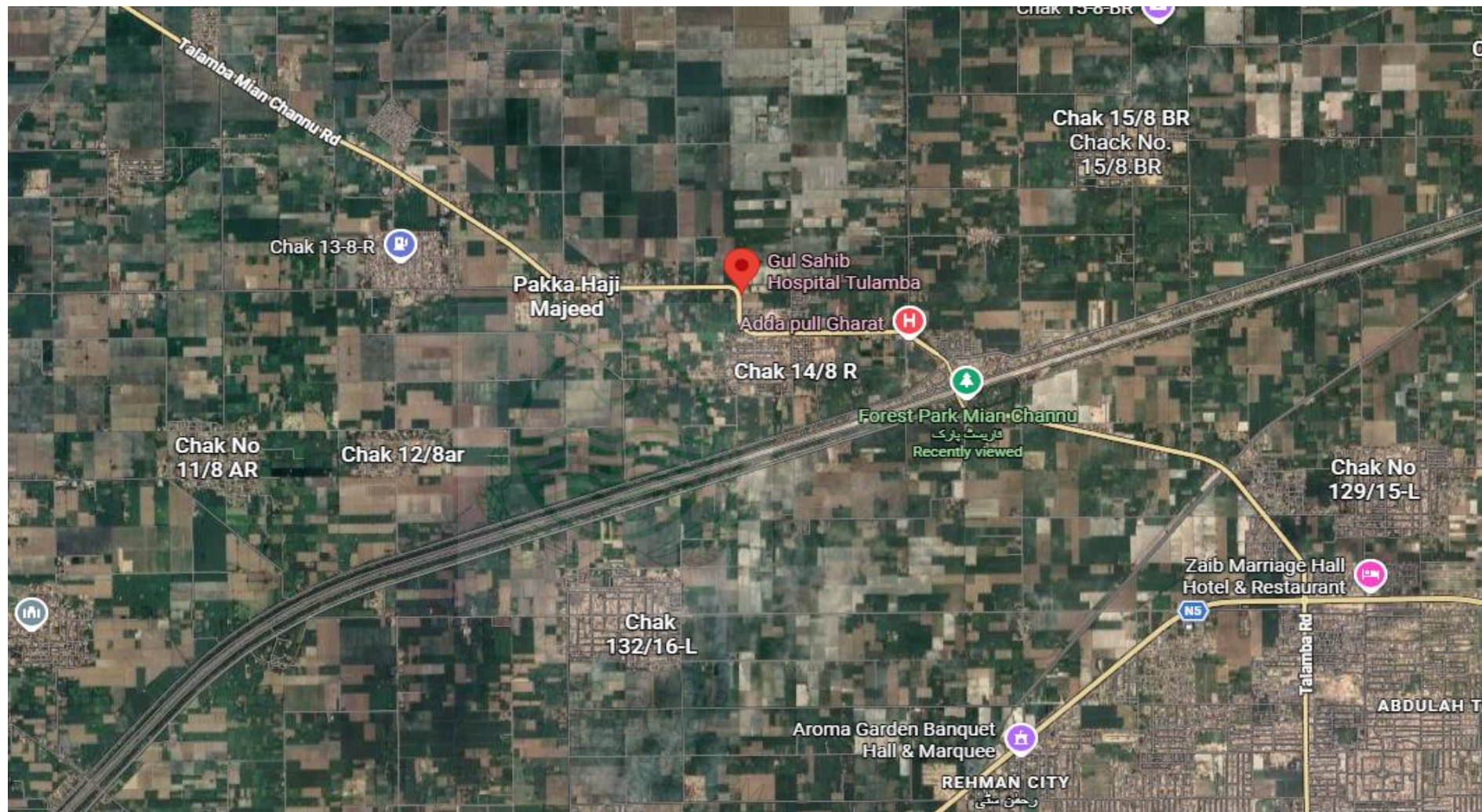


Figure 1.1 Location of Project Site

1.4 SCREENING (EIA OR IEE)

The screening was performed to determine whether the proposed project is required to be supported by:

- Initial Environmental Examination (IEE), Schedule I (Regulation 3), or
- Environmental Impact Assessment (EIA), Schedule II (Regulation 4)

According to Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022, Project for Hospital of 250 beds falls in Schedule II-H (3) categorized for Hospitals having more than 50 beds requiring an Environmental Impact Assessment (EIA).

SCHEDULE - II
(See Regulation 3)
List of projects requiring an EIA
H. Urban development and tourism
3. Hospitals having more than 50 Beds

1.5 SCOPING

The proposed project will be constructed within the premises of hospital. The major construction activities of the project will remain confined within the project boundaries, access roads and related infrastructure. For the physical environmental study, the spatial boundary was considered to be “Local” where the impact was limited to the local area of Tulamba around 6-7 Km distance from Mian Channu city. The Local Study Area (LSA) was established based on the zone of the Project influence, beyond which the potential environmental, cultural, and socio-economic effects of the Project are expected to be non-detectable. Some relevant information about Tehsil Mian Channu and District Khanewal were also included where required. In the case of the biological and socioeconomic environment, efforts were made to collect the information within 2 Km around the project area and even up to the region of 10 Km surrounding the proposed project where any direct or indirect impacts were envisaged.

The temporal boundaries have been defined as lasting with the life of the project. Segments of the temporal boundaries include the duration of the construction and operation phases of the Project.

1.5.1 Important Issues and Concerns raised during Consultation

During the consultation process, a wide range of concerns and potential impacts related to the project’s activities were highlighted:

- Compliance with Punjab Hospital Waste Management Rules 2014 was emphasized.

- Compliance with OSHA standards was recommended to ensure the health and safety of hospital workers, particularly concerning the handling chemicals and hospital hazardous waste.
- The importance of using appropriate personal protective equipment (PPE) including ear muffs/plugs, face masks, safety shoes, goggles, and helmet was stressed.
- Academics highlighted the significance of energy conservation and the use of low-noise machinery.
- Environmentalists pointed out the installation

1.5.2 Significant Impacts and Factors to be Determined

The construction phase requires careful evaluation of several environmental and social aspects, including levels of noise, dust, and air emissions, as well as potential risks to worker health and safety. It is also important to ensure sufficient and safe water supply, along with proper wastewater handling at the site. Additional considerations include creating job opportunities for nearby communities, managing traffic flow to reduce congestion and accident risks, restoring the site promptly after completion, and implementing tree planting and landscaping initiatives.

Once the project becomes operational, attention should shift to maintaining workplace health and safety, controlling air emissions, and ensuring readiness for fire emergencies. Effective systems for managing hospital waste and wastewater must be in place, along with efforts to recruit workers from the surrounding community. Adherence to Pakistan Environmental Quality Standards (PEQS), Punjab Hospital Waste Management Rules 2014, implementation of dengue prevention strategies, and continuous monitoring of planted vegetation are also essential.

1.6 APPROACH ADOPTED TO CONDUCT THE STUDY

The following approach and methodology have been adopted for conducting the EIA Study:

1.6.3 Screening

As presented in Section 1.4

1.6.4 Scoping

As presented in Section 1.5

1.6.5 Review of Available Data

A review of the available technical information of the proposed project along with engineering documents including preliminary design data of the project was conducted. Published literature was also reviewed.

1.6.6 Description of Project

This includes a clarification of the purpose and rationale of the project, and an understanding of its various characteristics – including stages of development, location, and processes. Meetings with the Hospital management were conducted to clarify the nature of the project from an environmental perspective. Preliminary analyses of the data received from the proponent were performed to identify key environmental issues that could arise from the Project.

1.6.7 Consideration of Alternatives

The consideration of alternatives ensures that the proponent has considered other feasible approaches, including alternative project locations, technologies, environment relevance, the 'no action' option, etc.

1.6.8 Environmental Baseline Survey

It includes the establishment of both the present and future state of the environment, in the absence of the project, taking into account changes resulting from natural events and other human activities. The project site was visited to collect primary data on groundwater quality, ambient air quality, noise level, and ecological species surviving in the area and the ecosystems prevalent. Preliminary socio-economic surveys including interviews of people around the site were also carried out to identify relevant environmental aspects. The tests for ambient air, groundwater were conducted by the EPA-certified laboratory M/s Solution Environmental Analytical Laboratory, and noise levels were measured using a noise meter.

1.6.9 Consultation with Stakeholders

The Stakeholders were consulted at each stage of EIA to enhance the quality and effectiveness of the EIA study. It would ensure that the experts' and general public's views were adequately taken into consideration in the decision-making process.

1.6.10 Identification of Main Aspects and Impacts

The aim is to ensure that all potentially significant environmental impacts (adverse and beneficial) against main aspects during preconstruction, construction, and operation phases have been identified.

1.6.11 Screening of Potential Environmental Impacts and Mitigation Measures

The collected data was evaluated and the relative significance of the identified impacts was assessed to allow a focus on the main adverse impacts. Mitigation involves the introduction of measures to avoid, reduce, remedy, or compensate for any significant adverse impacts.

1.6.12 Preparation of Environmental Management and Monitoring Plans

An environmental management plan (EMP) depicting the mitigation measures has been prepared and environmental monitoring plan has also been developed for the effective implementation of the EMP.

1.7 STRUCTURE OF REPORT

The EIA Study report is structured as follows.

The report begins with an executive summary. **Chapter 1** offers a project overview, including information about the proponent, consultant, and the Environmental Impact Assessment (EIA) process. **Chapter 2** outlines the relevant national and provincial legislation, regulations, and policies applicable to the project. **Chapter 3** provides a comprehensive description of the project summarizing its inputs and outputs. **Chapter 4** presents a baseline study of the project area, detailing the current physical, biological, and socio-economic conditions. **Chapter 5** outlines the consultation process conducted with stakeholders and general public. **Chapter 6** evaluates the potential impacts of the project, and propose mitigation measures to eliminate or minimize these impacts, compensate for losses, or rehabilitate the environment and includes residual impacts and defines monitoring requirements. **Chapter 7** delivers an Environmental Management Plan (EMP) and an Environmental Monitoring Plan for both the construction and operational phases of the project.

1.8 STUDY OF ALTERNATIVES

1.8.1 No Project Alternative

The “No Project Alternative” represents a scenario in which the proponent does not proceed with the establishment of the proposed 250-bed Gul Sahib Hospital at Tulamba, Tehsil Mian Channu, District Khanewal. Under this option, the existing environmental conditions of the site would remain largely unchanged, and potential impacts associated with the construction and operational phases, such as noise generation, air emissions, wastewater production, healthcare waste generation, and increased traffic, would be avoided.

However, the implementation of the no-project alternative would also result in the loss of significant social and healthcare benefits associated with the proposed hospital. The project is intended to improve access to quality healthcare services, reduce the need for patients to

travel to distant urban centers for medical treatment, and strengthen the healthcare infrastructure of Tehsil Mian Channu and the surrounding areas.

In addition, employment opportunities for both skilled and unskilled workers during the construction and operational phases would not be realized. The land identified for the project would remain underutilized and would not contribute to the provision of essential healthcare services for the local population.

Furthermore, the proposed hospital has been planned in compliance with applicable environmental regulations and standards, including the Punjab Environmental Quality Standards (PEQS) and Punjab Hospital Waste Management Rules. Appropriate mitigation measures will be implemented to manage emissions, wastewater, healthcare waste, noise, and occupational health and safety risks, thereby minimizing potential environmental impacts.

In conclusion, although the no-project alternative would avoid the environmental impacts associated with the development and operation of the hospital, it is not considered a preferred option due to the substantial healthcare, social, and economic benefits that the project will provide. The establishment of Gul Sahib Hospital is expected to play a vital role in improving healthcare accessibility, enhancing public health services, generating employment opportunities, and supporting the sustainable development of the region.

1.8.2 Location/Site Alternative

The feasibility of establishing the proposed hospital was evaluated based on several site selection criteria, including:

- Absence of environmentally sensitive or protected areas within or around the project site;
- Availability of land free from legal encumbrances;
- Easy accessibility from Tulamba, Mian Channu, and the surrounding road network;
- Availability of essential utilities and infrastructure; and
- Adequate security and safety conditions.

The proponent selected the proposed site because it is located within his native area, where he intends to contribute to the welfare and well-being of the local community by improving access to quality healthcare services. The site also satisfies the technical, environmental, and infrastructural requirements necessary for the successful development and operation of the proposed hospital.

1.8.3 Technology Alternatives

The selection of technology was primarily based on the following criteria:

- High quality healthcare services and patient safety
- Environmental friendliness and sustainability.

- Ease of compliance with PEQS.
- Availability of skilled workforce within the country.
- Integration of automation and digital technologies
- Healthcare waste handling
- Hospital information systems.
- Consideration of capital expenditure (CAPEX) and operating costs.

Conventional hospital technologies were evaluated against modern healthcare technologies based on the above factors and compliance with applicable healthcare standards. The selected technology incorporates modern medical diagnostic and treatment equipment, energy-efficient electrical systems, centralized medical gas distribution, digital record management through a Hospital Information Management System (HIMS), and advanced infection control measures. The hospital design also incorporates energy-efficient lighting systems, water conservation measures, standby power generation, HEPA filtration in critical areas, and negative-pressure isolation rooms where required.

For wastewater management, the installation of an Effluent Treatment Plant (ETP) will be installed to comply with relevant PEQS. Similarly, healthcare waste will be managed through segregation at source, secure storage, and disposal through EPA approved contractor

Based on the technical, environmental, operational, and economic evaluation, the proposed technology option was considered the most suitable for the project, as it ensures reliable healthcare services while complying with applicable environmental and healthcare regulations.

1.8.4 Economic Alternatives

The most economical alternative considered for the proposed Gul Sahib Hospital was the option of not undertaking the project and continuing to rely on existing healthcare facilities in the region. However, this option was not considered viable due to the growing demand for quality healthcare services in Tehsil Mian Channu and the surrounding areas. The proposed hospital will generate direct and indirect employment opportunities, support local economic activity, and improve access to medical services, thereby reducing healthcare-related travel costs for the local population. Although the project requires significant capital investment, its long-term social and economic benefits outweigh the costs. Therefore, the establishment of the proposed hospital was determined to be the most economically beneficial and sustainable option.

1.8.5 Environmental Alternatives

Various environmental alternatives were considered during the planning of the proposed Gul Sahib Hospital to minimize potential impacts on the surrounding environment. These included site selection, resource-efficient building design, wastewater treatment, healthcare waste management, and energy conservation measures. The selected option incorporates environmentally responsible practices, including an on-site Effluent Treatment Plant (ETP), proper segregation and disposal of healthcare waste, energy-efficient systems, and pollution control measures. These measures will help ensure compliance with applicable environmental regulations while minimizing impacts on air quality, water resources, soil, and the surrounding community. Appropriate localized and generalized ventilation systems will be installed to achieve safe and healthy environment for workers.

2. LEGAL, POLICY FRAMEWORK AND GUIDELINES

2.1 GENERAL

This chapter describes the proponent's legal responsibilities in the context of Environmental and Sustainable Development, addressing the relevant current policies, legal requirements and administrative framework for conducting the EIA of the project. Establishing an efficient and effective organizational structure is essential for the successful implementation of the identified mitigation measures. Similar to other projects, the proposed Project must undergo an Environmental Assessment in compliance with the Punjab Environmental Protection Act 1997 (Amended up to 2017) before implementation.

2.2 EXISTING LEGISLATION AND LEGAL FRAMEWORK

The Federal Ministry of Environment was responsible authority for policy making on environmental protection in Pakistan but after 18th Amendment in the Constitution, the Provincial Governments have taken over the subject of Environment. This EIA study has been carried out in the light of the policy guidelines of the Preparation of IEE/EIA Reports under the procedures and practices formulated by the Pak EPA and adopted by the Punjab Environmental Protection Agency (Punjab EPA).

2.2.1 Institutional Setup

2.2.1.1 Environment Protection Department, Punjab

The Punjab Government has established Environment Protection Department (EPD) administratively controlled by the Secretary, Government of Punjab. The EPD has its independent Minister. According to the provisions of the Punjab Environmental Protection (Amendment) Act, 2012, EPD has a significant role in policy making and implementation of the environmental laws in the Punjab Province.

2.2.1.2 Environmental Protection Council

The Punjab Environmental Protection Council (PEPC) is the apex decision-making body of Punjab. It was developed under the provision of Punjab Environmental Protection (Amendment) Act 2012 and headed by the Chief Minister of Punjab with other members.

2.2.1.3 Environmental Protection Agencies

Pak EPA was established at the Federal level and EPAs are established at Provincial level also. In Punjab an independent Environmental Protection Agency is constituted headed by the Director General. The purpose of EIA is to obtain Environmental Approval from the Environmental Protection Agency (EPA), Punjab in compliance with Pakistan Environmental Protection Act (PEPA) - 1997, that is now applicable having been amended by Punjab Environmental Protection (Amendment) Act 2012 and by Punjab Environment Protection (Amendment) Act 2017.

2.3 RELEVANT LEGAL / INSTITUTIONAL FRAMEWORK

The applicable laws for the environmental study of the project are briefly given below. The proponent of the project will abide by the applicable laws and regulations.

2.3.1 Pakistan Environmental Protection Order (PEPO) 1983

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) 1983. It was the first legislation promulgated for the protection of environment. According to PEPO, 1983 it was necessary to carry out IEE / EIA for all development projects, but there were no IEE / EIA regulations under that ordinance.

2.3.2 Punjab Environmental Protection Act 1997

Section 12 of the Punjab Environmental Protection Act 1997 (Amendment 2017) makes it mandatory for the proponent of a project to file with the Environmental Protection Agency either an Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA), as the case may be, in respect of the project.

2.3.3 Regulations Punjab Environmental Protection (Review of IEE/EIA)

Regulations 2022

Punjab Environment Protection Department notified the Punjab Environmental Protection (Review of IEE/EIA) Regulations 2022 on December 16, 2022.

Categorization of the projects for IEE and EIA is one of the main components of the Regulations. Projects have been classified based on expected degree of adverse environmental impacts. Projects type listed in Schedule I are designated as causing potentially less adverse effects, and require an IEE whereas Schedule II covers projects with potentially high adverse effects and require EIA to be conducted.

2.3.4 Punjab Hospital Waste Management Rules 2014

These rules read with Punjab Environmental Protection Act 1997 (amended 2017) dictate that every hospital shall be responsible for the proper management of the waste generated by it till its final disposal in accordance with the provisions of the Act and the rules. The rules provide guidelines for:

- Hospital waste management team along with their responsibilities.
- Waste management plan,
- Waste transportation, storage and waste disposal,
- Actions to be taken during accidents and waste spillage,
- Waste minimization and reuse and
- Inspection and legal proceedings

2.3.5 Pakistan Nuclear Regulatory Authority (PNRA) Ordinance 2001

Subject to the provisions of this Ordinance, the Authority shall have the responsibility for controlling, regulating and supervising all matters related to nuclear safety and radiation protection measures in Pakistan. It defines the powers and functions of the Authority.

The Authority grant authorization, or issue license for the production, storage, disposal, trade in and use of any nuclear substance, radioactive material or any other substance or equipment used for production or use of nuclear energy.

Also, the generator of radioactive waste shall be responsible for safe and secure management of its radioactive waste in accordance with the relevant PNRA regulations for the purpose.

2.3.6 The Punjab Local Government Ordinance, 2001

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. There are notwithstanding any specific provisions, every local government may perform functions conferred by or under the Punjab Local Government Ordinance, 2001, and in performance of such functions may exercise such powers, which are necessary and appropriate. Under the ordinance, the local councils are authorized to restrict projects causing pollution to air, water or land. They may also initiate schemes for improving the environment.

2.3.7 Pakistan Penal Code, 1860

Pakistan Penal Code 1860, last amended in 2017, Chapter XIV has Sections that deal with the offences affecting the public health, safety, convenience, decency and moral.

2.3.8 The Land Acquisition Act, 1894

The Land Acquisition Act (1894) deals with the acquisition of private properties for public purposes. There are 55 sections in this Act mainly dealing with area notification, surveys, acquisition, compensation, apportionment awards, disputes resolution, penalties and exemptions.

Although quite old, this act laid out the legal basis for any property affected by a project and for compensating the effected owners of the land.

2.3.9 Labor Laws

Labor Laws include Employment of Child Act-1991; the Bonded Labor System (Abolition) Act 1992; Workmen`s Compensation Act-1923; Minimum Wages Ordinance-1961; The Industrial and Construction Employment Ordinance 1968. Pakistan has ratified 36 ILO conventions including 8 fundamental conventions. Pakistan has declared to bring national labor laws in conformity with the ILO Conventions. Further the Constitution (Eighteenth Amendment) Act, 2010 substantially changed the roles and responsibilities of federal and provincial governments including the devolution of labor administration to the provinces.

Operational activities during construction may affect occupational health of workers. Employers are required to abide by labor laws in respect of their own employees and to ensure that contractors to follow the relevant labor laws and rules relating to safety of the workforce and creating a healthy working environment. The proponent shall ensure that the

labor force engaged at the project site is not exposed to any danger by monitoring the contractor's work frequently.

2.3.7.1 Employment of Children Act 2016

An Act to ban the employment of children and to limit the work of adolescents (ages 15 to 18) in specific occupations and processes, such as the transportation of passengers, goods, or mail; working with live electrical wires over 50 volts; and exposure to toxic materials.

2.3.8 Antiquity Act 1975

The Pakistan Antiquities Act of 1975 aims to safeguard physical cultural resources in Pakistan. This Act specifically protects designated "antiquities" from destruction, theft, neglect, illegal excavation, and trade. It prohibits new construction near protected antiquities and grants the Government of Pakistan (and Provincial Governments following the 18th Amendment to the Constitution) the authority to restrict excavation in areas that may contain archaeologically significant artifacts.

2.3.9 Drug Act 1976

The **Drugs Act, 1976** is a key piece of legislation in Pakistan that regulates the manufacture, import, export, storage, distribution, and sale of pharmaceutical products. Its primary objective is to ensure that medicines available in the market are safe, effective, and of standard quality. The Act provides the legal framework for the control of drugs through licensing of manufacturers, registration of products, and inspection of pharmaceutical establishments. It also establishes mechanisms for quality control, including the Drug Testing Laboratories and the enforcement of Good Manufacturing Practices (GMP). Under this law, the government is empowered to take strict action against the production and sale of substandard, spurious, or misbranded drugs. The Act is implemented through regulatory authorities at the federal and provincial levels, ensuring compliance within the pharmaceutical sector. Overall, the Drugs Act, 1976 plays a vital role in protecting public health by maintaining the quality and safety of medicines in Pakistan.

2.4 POLICIES FRAMEWORK

2.4.1 National Environmental Policy 2005

The National Environmental Policy (2005) provides a framework for addressing the environmental issues (particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of bio diversity, desertification etc.) confronting Pakistan. It recognizes the goals and objectives of the Pakistan National Conservation Strategy (PNCS, 1992), National Environmental Action Plans, and other existing environment related national policies, strategies, and action plans. It also provides broad guidelines to the Federal Government, Provincial Governments, federally

administrated territories and local governments to address their environmental concerns and to ensure effective management of their environmental resources.

2.4.2 National Drinking Water Policy 2009

The Government of Pakistan (Ministry of Environment) formulated this policy to provide adequate quantity of safe drinking water to entire population of Pakistan. The Policy aims to reduce the incidence of death and illness caused by water-borne diseases. The policy also provides specific guidelines for increasing access to safe drinking water, protection and conservation of surface and groundwater resources, water treatment and safety, community participation, public awareness, capacity development, public private partnership, research and development, emergency preparedness and response and coordinated planning and implementation. It also enforces National Drinking Quality Standards.

2.4.3 Punjab Drinking Water Policy 2011

The “Punjab Drinking Water Policy” provides guiding principles under which the efforts of provincial and local authorities shall be planned and coordinated. To keep the policy framework in line with the aims of the Federal Government, the Government of Punjab has adopted the key principles outlined in the National Drinking Water Policy of 2009.

2.4.4 National Water Policy 2018

The objective of the National Water Policy is to take cognizance of the emerging water crisis and provide an overall policy framework and guidelines for a comprehensive plan of action. The Policy is a national framework within which the provinces can develop their master plans for sustainable development and management of water resources. The water resource is a national responsibility but irrigation and agriculture, as well as rural and urban water supply, environment and other water-related subsectors are provincial subjects.

2.4.5 Punjab Water Policy 2018

This Punjab Water Policy is a sectoral policy document at provincial level. The overall objective of Punjab's Water Policy is to provide clear policy directions to the Government of Punjab on the sustainable management and development of water from all sources of water (surface water, groundwater and rainwater), for all sub-sectors of water use (domestic, stock water, agriculture, industry, commercial and environment) and for all regions (Indus basin canal commands and outside the canal commands) at the basin level through equitable water allocations, management and development.

2.4.6 Pakistan Biodiversity Strategy and Action Plan (2017-2030)

This document provides a framework for implementation as well as monitoring and evaluation of the National Biodiversity Strategies and Actions Plan and also provide a framework for implementation of provincial biodiversity action plans.

2.4.7 National Climate Change Policy 2012

The Policy provides a framework for addressing the issues in various sectors such as water, agriculture, forestry, coastal area, biodiversity and other vulnerable ecosystems. It ensures environmental compliance through IEE and EIA in the development process.

2.4.8 Punjab Protection of Trees Act, 2025

The Act requires mandatory, prior written approval from the designated Tree Officer before felling or removing trees on non-forest urban lands. In return for any approved cutting, applicants are typically bound to plant and tend at least two replacement trees.

2.4.9 Punjab Labor Policy 2018

The Punjab Labour Policy 2018 is a comprehensive policy framework introduced by the Government of Punjab, Pakistan to promote and regulate labor rights and welfare in the province. Overall, the Punjab Labour Policy 2018 aims to strengthen labor rights, promote worker welfare, and create a conducive environment for industrial and economic growth in the province.

2.4.10 National Safety Policy - (NP-02/2020)

The National Safety Policy outlines the Major Implementation Principles and make it clear that the prime responsibility for safety must rest with the person or organization responsible for facilities and activities that give rise to radiation risks. It emphasizes to establish and implement an effective integrated management system to promote a strong safety culture within the organization and ensure that senior management shall demonstrate commitment and leadership for safety and its continual improvement within the organization.

2.4.11 National Disaster Response Plan 2019

The National Disaster Response Plan is the main policy document that guides Pakistan's approach to national disaster management.

2.4.12 Punjab Women Development Policy 2018

The Punjab Women Development Policy 2018 was created by the provincial government with the intention of creating a gender-sensitive Punjab. Its objectives are to address the full spectrum of women's development issues and challenges in accordance with the spirit of the Constitution, Pakistan's international obligations, and the provincial government's pursuit of gender mainstreaming and women's empowerment in Punjab.

2.5 NATIONAL AND INTERNATIONAL GUIDELINES

2.5.1 Guidelines for the Preparation and Review of Environmental Reports 2017

The scope of this guidelines is confined to those aspects of environmental report preparation and review which are of a general nature. Most of the Sections of these guidelines apply to both IEE and to EIA.

2.5.2 Guidelines for Public Consultation 1997

Pakistan EPA's guidelines explain objectives, stakeholders and their level of involvement; techniques for public consultation; factors for effective public consultation; consensus building and dispute resolution etc.

2.5.3 Checklists for IEE/EIA Projects: Pakistan EPA 1997

These checklists provide guidelines for preparation and review of environmental reports, and also include the Sectoral Guidelines for around 20 different sectors. The guidelines for Sector – Major Chemical and Manufacturing Plants deal with General Manufacturing Industry which may which may include facilities such as Sugar Mills. .

2.5.4 IFC EHS Guidelines for Health Care Facilities:

The EHS guidelines address design considerations and environmental related issues of HCF which occur during operations phase along with their management.

Internationally recognized guidelines for design and construction of hospitals and HCFs include the American Institute of Architects (AIA) and the Facility Guidelines Institute (FGI). American Society for Healthcare Engineering (ASHE) of the American Hospital Association (AHA), and the Green Guide for Health Care (www.gghc.org). These guidelines should be used to verify the adequacy of planning for new HCFs or renovation of existing facilities.

Environmental issues associated with HCF include the following:

1. **Waste Management:** It should include the components such as categorization of wastes, Waste Minimization, Reuse, and Recycling, Waste Segregation Strategies according to its category using a color-coded system, On-site Handling, Collection, Transport and Storage, Transport to External Facilities, Treatment and Disposal Options. Wastes from each category should be treated according to the treatment methods and technologies described in Annexure I
2. **Emissions to Air:** Sources of air emissions at HCFs may include exhaust air from HVAC systems, ventilation of medical gases and fugitive emissions released from sources such as medical

waste storage areas, medical technology areas, and isolation wards. Emissions may include exhaust from waste incineration or combustion at Power generation.

3. **Wastewater Discharges:** Wastewater from HCF has a major portion having quality similar to domestic wastewater and a portion of HCF wastewater is contaminated from discharges from medical wards and operating theaters, laboratories, pharmaceutical and chemical stores; cleaning activities and x-ray development facilities. Effluent limits of parameters for Health Care Facilities are presented in Annexure I.

2.5.5 WHO Guidelines “Safe Management of Wastes from Health-Care Activities”

WHO has published its 2nd Edition of Handbook (2014) on the safe, sustainable and affordable management of health care waste commonly known as “Blue Book”. The Handbook provides details of waste characterization and risk associated with health care waste and their legislative, regulatory and policy aspects followed by waste management planning, waste minimization, reuse and recycling and details of segregation, storage and transport along with waste treatment and disposal methods. The Handbook also includes details on Collection and disposal of wastewater; Economics of Health Care waste management, health and safety practices; Hospitals hygiene and infection control; the need of training, education and public awareness and health care waste management in emergencies.

2.6 PUNJAB ENVIRONMENTAL QUALITY STANDARDS (PEQS)

The Punjab Environment Department had notified the relevant PEQS in 2016 for:

- Ambient Air
- Drinking Water
- Industrial Gaseous Emissions
- Motor vehicles exhaust and noise
- Noise
- Municipal and Liquid Industrial Effluents
- Punjab Environmental Quality Standards for Treatment of Liquid and Disposal of Bio-medical Waste by Incineration, Autoclaving, Microwaving, and Deep Burial

3 DESCRIPTION OF PROJECT

3.1 GENERAL

This section describes brief details of the proposed Project “Establishment of Gul Sahib Hospital, Tulamba, Tehsil Mian Channu, District Khanewal” over a land area of 21 Kanal-08 Marla.

The detail of new buildings and salient features are given with an emphasis on project layout, geographical location of buildings, land requirement, detail of utilities, waste management The project cost and magnitude, implementation schedule and Restoration plans are also presented

3.2 OBJECTIVES OF THE PROJECT

The specific objectives of the project are to:

- Establish a General Hospital having 250 beds
- Improve access to quality healthcare services in Tehsil Mian Channu and adjoining areas and contribute to the social welfare of the local community. Compliance with Punjab
- Reduce the need for patients to travel to distant cities for medical treatment.
- Facilitate deserving patients with an opportunity to be treated irrespective of their paying capacity
- Provide modern diagnostic, emergency, and specialized healthcare facilities.
- Create employment opportunities for skilled and unskilled workers during both construction and operational phases.
- Operate in compliance with applicable healthcare, environmental, and occupational health and safety regulations.
- Deliver healthcare services using modern medical technologies and environmentally responsible practices.

3.3 LOCATION AND SITE LAYOUT OF THE PROJECT

The project site is located at Chak 14/8 R, along Tulamba – Mian Channu Road in Tehsil Mian Channu, District Khanewal, Punjab. The hospital is around 6-7 Km from Mian Channu. The coordinates of project site are Latitude 30.475437° Longitude 72.320395° whereas the location of the project is illustrated in Figure 1.1.

The site layout is submitted with the application.

3.4 LAND USE ON THE SITE

The site is currently vacant and devoid of standing crops, trees, or permanent structures. The surrounding area remains predominantly agricultural in nature. No wetlands, protected areas, forests or other environmentally sensitive features were observed within the immediate project area. Basic infrastructure, including road access and electricity supply, is available in the vicinity of the project site.



Figure 3.1 Current Land Use of Project Site

3.5 ROAD ACCESS

The project site is situated along Tulamba – Mian Channu Road which connects the site to National Highway N-5 and also connects to Lahore –Multan Motorway M-4. This strategic location ensures easy connectivity to major cities and ports across Pakistan.



3.6 VEGETATION FEATURE ON SITE

Visual inspection indicates that the land has been traditionally used for agricultural purposes and is largely devoid of permanent structures or significant built-up development. The surrounding area is predominantly characterized by agricultural land and farm-related activities.

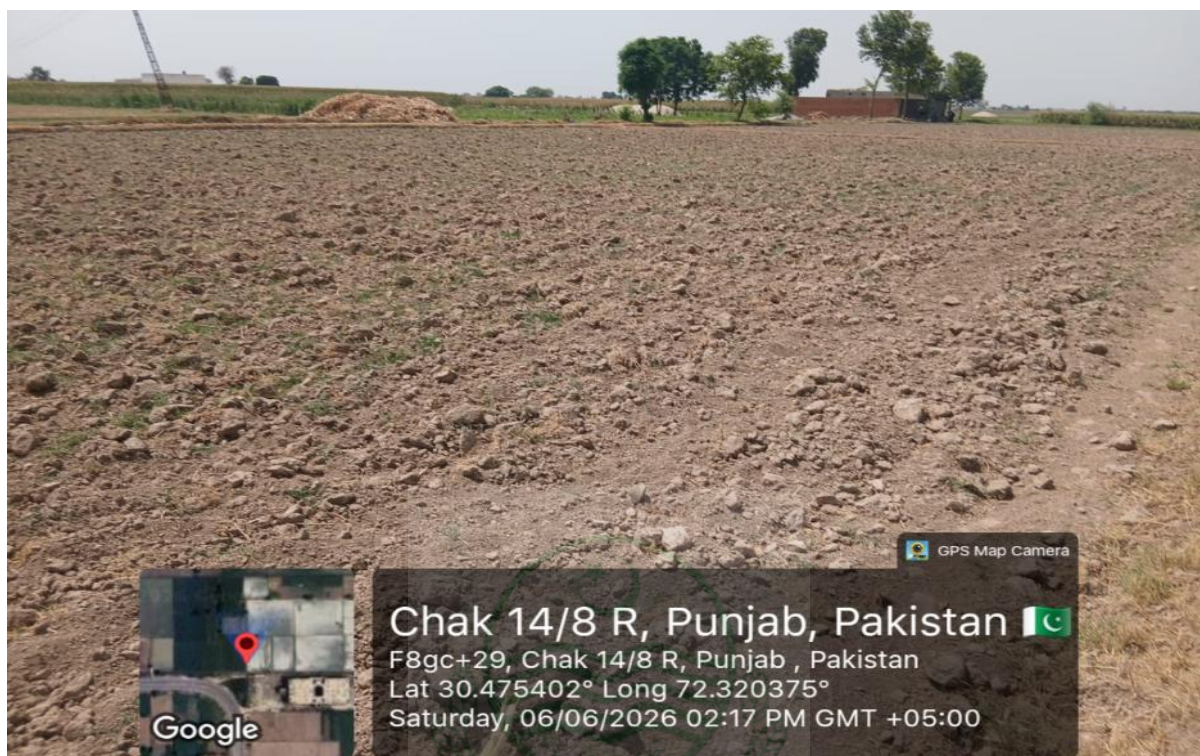


Figure 3.3: Vegetation at Project Site

3.7 COST AND MAGNITUDE OF THE PROJECT

The estimated cost of the proposed project (Mechanical, Electrical and others) is around PKR 1.2 Billion.

The Project involves civil, electrical and mechanical activities along with the installation of diverse equipment, machinery,

The project also includes the installation of effluent treatment plant.

3.8 SCHEDULE OF IMPLEMENTATION

Following the environmental approval, construction of the hospital building and associated infrastructure will commence. This will be followed by the installation of medical machinery, equipment, and other allied facilities required for hospital operations. The construction phase is expected to be completed within approximately 1.5 years

3.9 DESCRIPTION OF THE PROJECT

The proposed project involves the establishment of a 250-bed General Hospital to be located at Tulamba–Mian Channu Road, Tulamba, Tehsil Mian Channu, District Khanewal, Punjab. The project is being developed to provide quality healthcare facilities to the local population and surrounding communities, addressing the growing demand for modern medical services in the region.

The project aims to improve access to healthcare facility, reduce patient travel to distant urban centers, and enhance the overall health infrastructure of Tehsil Mian Channu and adjoining areas. The proposed hospital will operate in compliance with the applicable requirements of the Punjab Healthcare Commission (PHC) and other relevant regulatory authorities.

3.9.1 Process Description

3.9.1.1 Healthcare Services and Operational Processes

The hospital will provide a wide range of healthcare services including Emergency Services, Outpatient Department (OPD), Inpatient Wards, Intensive Care Unit (ICU), Coronary Care Unit (CCU), Gynecology and Obstetrics, Oncology, Operation Theatres, Laboratory Services, Diagnostic Imaging, Pharmacy, Physiotherapy, and other allied healthcare services.

The operational process will generally involve patient registration, clinical consultation, diagnostic investigations, treatment and medication, surgical interventions where required, inpatient care, and discharge management. Emergency services will operate on a 24-hour basis to provide immediate medical care to patients.

3.9.1.2 Diagnostic and Medical Technology

The hospital will utilize modern medical equipment and healthcare technologies for diagnosis and treatment. Major equipment is expected to include:

- Digital X-Ray systems
- Ultrasound machines
- CT Scan and other imaging equipment (if installed)
- Laboratory analyzers
- Patient monitoring systems
- Ventilators
- Anesthesia machines
- Operation theatre equipment
- ICU and CCU monitoring equipment
- Medical gas distribution systems

All medical equipment will be procured from approved manufacturers and operated by trained healthcare professionals in accordance with applicable healthcare standards.

3.9.1.3 Hospital Waste Management

Waste Generation Points include Operation theatres, Laboratories, Treatment wards, Isolation Rooms, IPDs, OPDs, FDS, Offices and Parking etc. Waste and by-products cover a diverse range of materials, as the following list illustrates different types of Hospital wastes (Source: WHO)

- **Infectious waste:** waste contaminated with blood and other bodily fluids (e.g., from discarded diagnostic samples), cultures and stocks of infectious agents from laboratory work (e.g., waste from autopsies and infected animals from laboratories), or waste from patients with infections (e.g., swabs, bandages and disposable medical devices);
- **Pathological waste:** human tissues, organs or fluids, body parts and contaminated animal carcasses;
- **Sharps waste:** syringes, needles, disposable scalpels and blades, etc.;
- **Chemical waste:** for example, solvents and reagents used for laboratory preparations, disinfectants, sterilant and heavy metals contained in medical devices (e.g., mercury in broken thermometers) and batteries;
- **Pharmaceutical waste:** expired, unused and contaminated drugs and vaccines;
- **Cytotoxic waste:** waste containing substances with genotoxic properties (i.e., highly hazardous substances that are, mutagenic, teratogenic, or carcinogenic), such as cytotoxic drugs used in cancer treatment and their metabolites;
- **Radioactive waste:** such as products contaminated by radionuclides including radioactive diagnostic material or radiotherapeutic materials; and
- **Non-hazardous or general waste:** waste that does not pose any particular biological, chemical, radioactive, or physical hazard.

A simplified waste disposal flowchart except radioactive waste is illustrated in Figure 3.4.

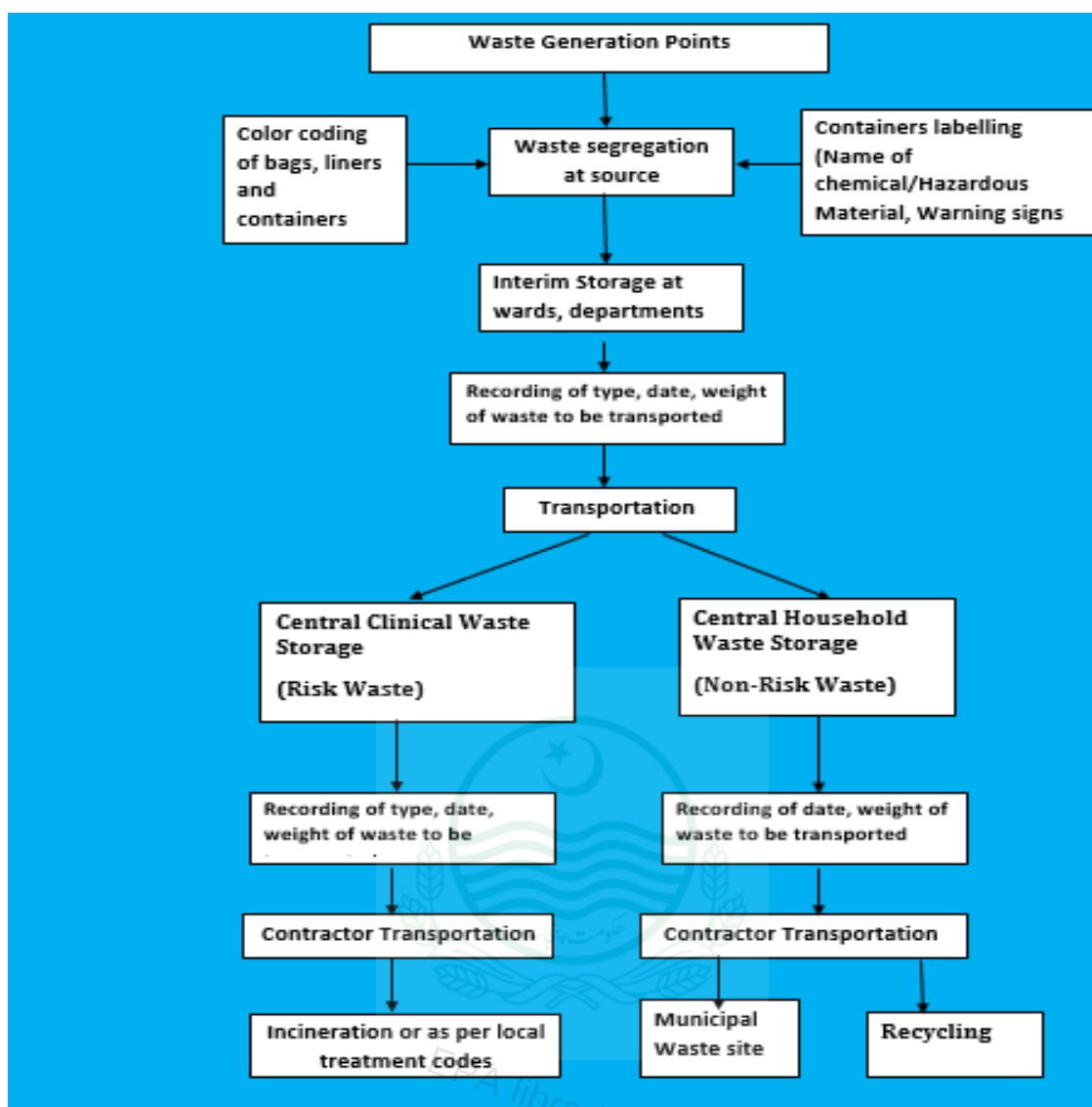


Figure 3-4: Waste Disposal at Gul Sahib Hospital (Proposed)

3.9.1.4 Wastewater Management

Hospital wastewater is any water adversely affected in quality during provision of healthcare services. It is mainly liquid waste containing some solids disposed of mainly by staff and patients or during other health-related processes such as cooking, cleaning, and laundry.

A large part of Hospital wastewater is of domestic-wastewater quality and poses the same risk. However, a proportion of wastewater generated from the Hospital will pose a higher risk than domestic wastewater as it contains chemicals, pharmaceuticals, contagious biological agents, and even radioisotopes. Laboratories are the major source of chemicals in wastewater streams. Of special relevance are halogenated and organic solvents, colorants from histology and hematology (Gram staining), cyanides (hematology), formaldehyde, and xylene (pathology). Laboratories also contribute to the presence of blood and body fluids in

wastewater from emptying the samples into the sink. WHO recommends Pre-treatment such as acid-base neutralization, filtering to remove sediments, and disinfection for waste streams from departments such as medical laboratories⁴.

Improper wastewater management, collection, treatment, and disposal may cause health and environmental hazards. Excessive nutrients cause biological degradation of groundwater, lakes, and rivers by using oxygen. Pharmaceuticals in water could result in endocrine (or hormonal) disruption. Antibiotics may result in antibiotic-resistant pathogens. Water-borne diseases such as cholera, hepatitis, typhoid fever may outbreak in communities; may also result in vector-borne diseases and parasites such as Dengue fever, malaria. A simplified flow chart of proposed wastewater disposal at the project is given in Figure 3.5.

The Histology Lab, Hematology Lab, Biochemistry Lab produce clinical wastewater which will be decontaminated by chemical/thermal treatment (autoclave) using Kill Tanks before its discharge to sewer. Nuclear Medicine Department generates radioactive contaminated wastewater; this will be kept in Delay Tanks for a specified period depending on the radioactive intensity in order to reduce its radioactivity to an acceptable level..

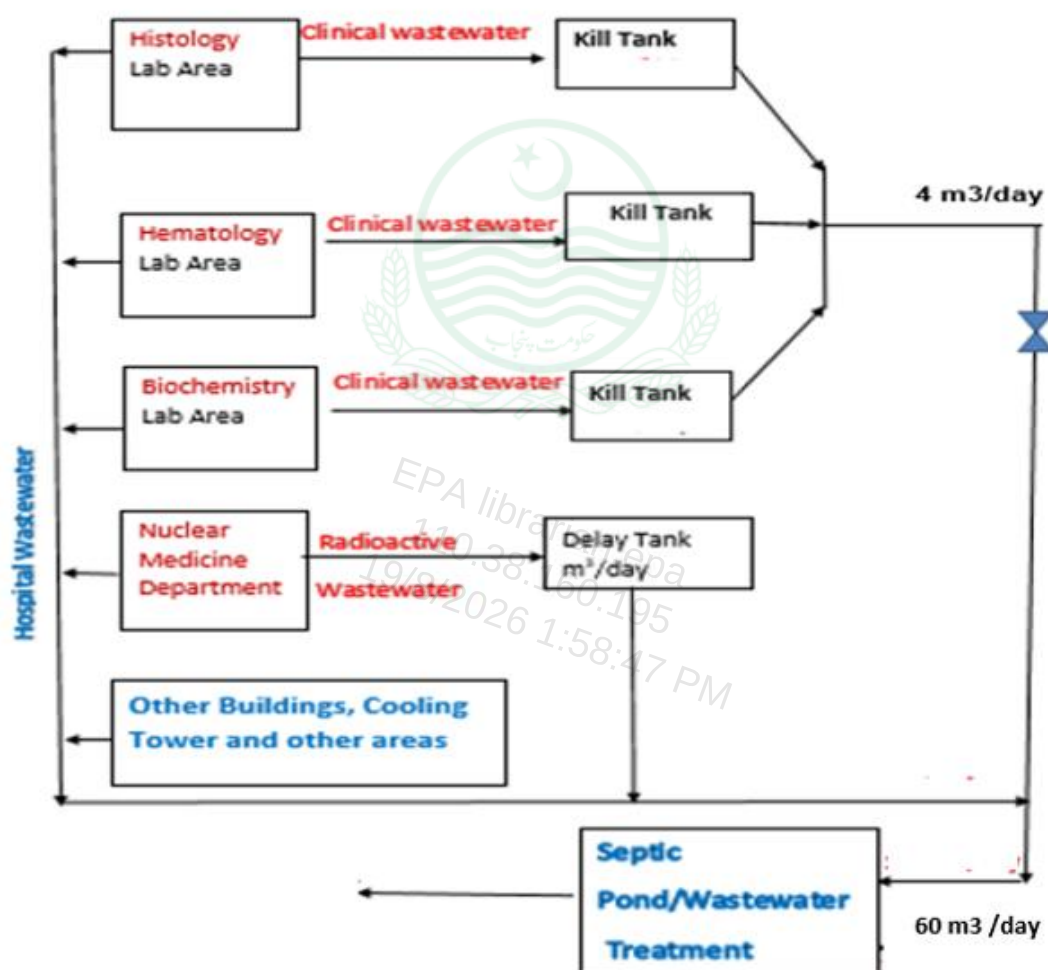


Figure 3-5: Proposed Wastewater Disposal System of Proposed Project

3.9.1.5 Wastewater Treatment

Design Capacity = 60 m³ per day

Type: Activated Sludge type with Tertiary Treatment and Disinfection

Process Flow Diagram:

Figure 3-6 shows a generalized schematic diagram of on-site hospital wastewater treatment system as recommended by WHO and proposed for implementation at Gul Sahib Hospital. A packaged wastewater treatment unit, designed and constructed by a reputable supplier will be installed to ensure effective treatment of wastewater generated by the facility.

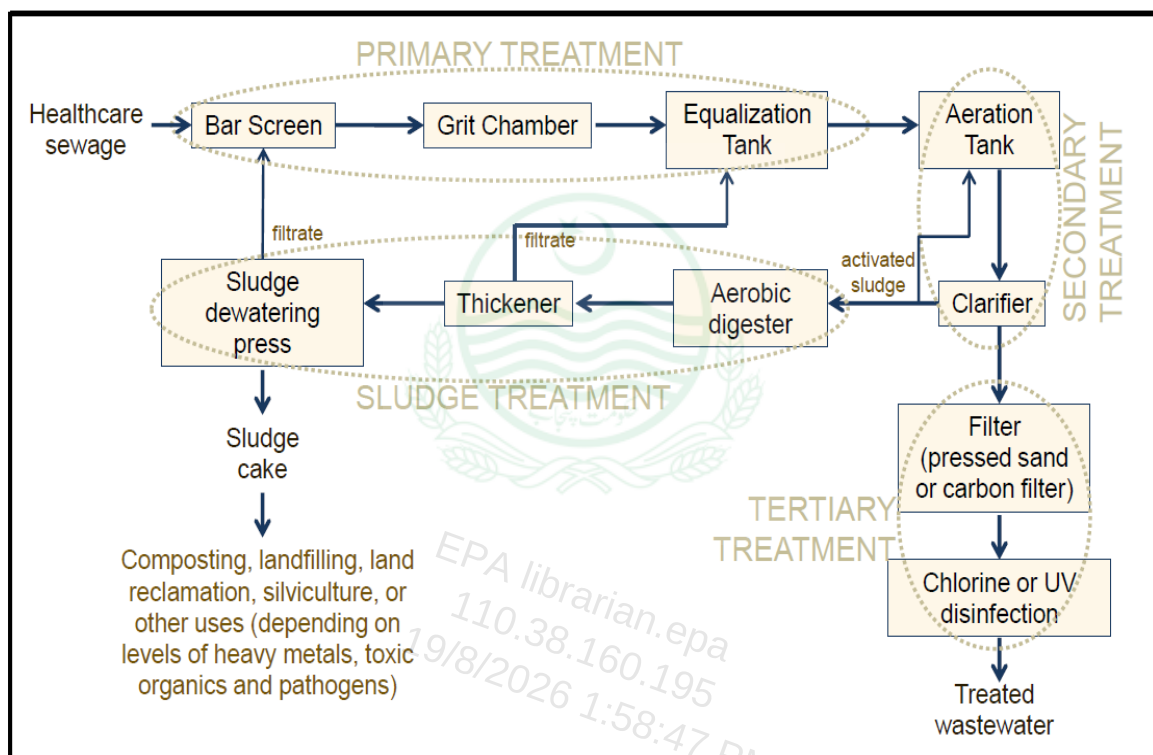


Figure 3.6 : Process Flow Diagram of Effluent Treatment Plant

Treatment Scheme:

Screening

Screening of feed effluent through Mechanical screen to remove the large floating material which may damage downstream equipment.

Equalization Tank

Wastewater generated from the textile dyeing operations is first conveyed to the equalization tank. The tank homogenizes variations in flow, pollutant concentration, and pH, ensuring consistent hydraulic and organic loading to downstream treatment units.

Aeration Tank

The effluent from equalization tank enters the aeration tank, where air is supplied through diffusers. This step facilitates oxidation of biodegradable organic matter, leading to reduction in BOD and stabilization of effluent quality.

Secondary Clarifier

The aerated wastewater is directed to the secondary clarifier for gravity settling of suspended solids and biological flocs. Clarified effluent overflows to Tertiary Treatment system.

Tertiary Treatment

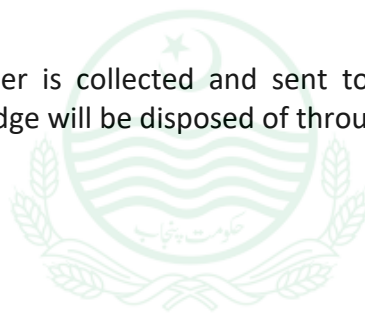
The clarified effluent is further treated by passing through a filter.

Disinfection

The clarified effluent will be disinfected through chlorination using sodium hypochlorite before discharge or reuse.

Sludge Handling

Settled sludge from the clarifier is collected and sent to sludge thickening followed by dewatering. The dewatered sludge will be disposed of through EPA approved contractor.



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3.9.1.3 Overview of the Proposed Project

Salient features of the proposed project are presented in Table 3.1

Table 3.1: Overview of Gul Sahib Hospital

1.	Project Nature	General Hospital
2	Total No. of beds	250
3	Total Land	21 Kanal 8 Marla (116,419 sq. Ft)
4	Total Covered Area	191,564 sq. Ft (all floors)
5	Estimated Project Cost	PKR. 1.2 Billion
6	Floors	Basement, Ground Floor, 4 Upper Floors, Mumty
		Services
	Basement (34688 sq., Ft)	• Radiology: X-Ray, Fluoroscopy, Mammography, CT Scan, MRI Room, Ultrasound rooms with consoles • Diagnostics passage, Blood Bank, Laboratory Hall • Water tanks: OHWT (firefighting & drinking), UGWT (firefighting & drinking) • Septic tank, rainwater tank • Laundry, Workshop, Kitchen, Kitchen Store • Prayer areas – men's (72 persons), women's (36 persons)
	Ground Floor (34908 sq. Ft)	• Emergency, Triage, Resuscitation, Isolation Rooms • OPD, Dental Rooms, Doctor Rooms, Pharmacy • Admin Office, Reception, Central Atrium (Sitting Area / Void) • Flower Shop, Tuck Shop, Kitchen, • Sample Collection, Plaster Room
	1 st Floor (33731 sq. Ft)	• Eye Ward, ENT Ward, Orthopaedic Ward, Thalassemia Ward, Artificial Limbs section • Telemedicine Room • VIP/General Patients Rooms • Pharmacy, Nursing Lounge, Admin Areas, Director's Office • Record Room, Computer/Data Room, Meeting Room • Library, Auditorium
	2 nd Floor (31747 sq. Ft)	• Medical ICU, Surgical ICU, Paediatric ICU • High Dependency Unit (HDU) Ward • Surgical Ward, Gynae Ward, Medical Ward, Paediatric Ward • Pantry, Kitchen, Store rooms
	3 rd Floor (32740 sq. Ft)	• Operation Theatres OT.1–OT.4, Recovery • Anaesthesia room,

		• Labor Rooms, Delivery Rooms, Well Baby Nursery • Obstetrics/Gynae, Resuscitation, COVID Room • Cardiotocography (CTG) Room, Pelvic Room, Ultrasound Room	
	4 th Floor (23387 sq. Ft)	Staff Hostel	
	Mumty (363 sq. Ft)	• Overhead Water Tank (OHWT) for firefighting – 30,608 gallons (UK) • OHWT for building/domestic use – 30,608 gallons (UK)	
B.	Project Design		
	Architect	M/s Design Matrix	
	Detailed designing and Construction	M/s Design Matrix	
	Main Design Code	FGI-2018 (Facility Guideline Institute for design and construction of Healthcare Facilities)	
C.	Utilities Requirement		
	Water	Groundwater from Tubewell Pumps	
		20 m3 per day (During Construction)	
		Total 100 m3 per day (During Operational phase)	
	Electricity	Electricity demand = ---- kW; MEPCO (WAPDA) power supply with an alternate emergency source of diesel generators ----- kW	
	Medical Gas System	A centralized medical gas distribution system will be installed to supply oxygen, medical air, vacuum, and other medical gases to critical care areas including ICUs, operation theatres, emergency rooms, and patient wards	
D.	Waste Handling (Operational Phase)		
	Biomedical Waste (Hazardous Waste)	250 kg/day, To be disposed of through EPA approved contractor	
	Non-Hazardous Waste	Non-Hazardous (MSW) = 200 kg/day To be disposed of through MC Mian Channu	
	Wastewater	- Design capacity of Effluent Treatment Plant (ETP) = 60 m3 per day - Wastewater will be treated in ETP before discharge - Pretreatment of influents from Pathological Labs and Nuclear Medicine Labs before disposal to External Drain.	
E.	Workforce	Construction Phase 50-60	Operational Phase: Staff 200
F	Fire fighting	The Fire Protection and Life Safety System shall be installed including fire hydrants, fire sprinklers, smoke & heat detectors, fire extinguishers, etc. along with 30.608 Imperial gallons firewater storage.	

3.10 RESTORATION AND REHABILITATION

The objective of the restoration and rehabilitation activities is to minimize the environmental impact of the construction and industry installation, and to ensure the site is safe, functional, and aesthetically pleasing after the work is completed.

- A clause will be included in the contract with the contractor to ensure restoration and rehabilitation of the site after completion of construction phase.
- All the temporary cabins and containers will be removed from the construction site.
-
- The construction area will be thoroughly cleaned, including the removal of material stockpiles, and proper disposal of any metal, hazardous or non-hazardous waste, debris, and residues remaining after the completion of construction.
- The excavated earth will be stored at a designated location and utilized for leveling, filling pits, and landscaping during and after the construction phase.
- Any damaged infrastructure, such as fences, roads, or utility services, will be repaired or restored to their original condition.
- Finally, the EMP Team will inspect the site to ensure proper restoration has been completed before granting clearance to the contractor for final payments.
- Landscaping and the plantation of indigenous trees will be carried out on the open land and along the boundary wherever practicable.

3.11 GOVERNMENT APPROVALS

Environmental Approval for the construction phase is being obtained from the Punjab Environmental Protection Agency (Punjab-EPA). Upon obtaining this approval, GSH will proceed with securing the remaining statutory permits and approvals from the concerned authorities, as Environmental Approval is a mandatory requirement for their issuance.

3.12 HEALTH, SAFETY AND ENVIRONMENT AT HOSPITAL

Hospital Management:

- Implement a written Safety and Health Policy
- Recognizes the employees' contribution to worker safety and health at their workplace;
- Defines and communicate effective worker safety goals and expectations.
- Allocates appropriate resources (funds and time) to accomplish goals

- Informs employees of hazards in their work areas.
- Review all contractor job plans for safety and health hazards, prevention, and control.
- Inform all contractors of the hazards they may encounter during their work on site

Employees:

- Know how to report an injury, illness, hazard, or concern, including near misses
- Are involved in workplace health and safety inspections and incident investigations.
- Understand the employers' responsibility in the safety and health management system.
- Know their role in Safety and Health Management System
- Are provided trainings of hazards identification, hazards prevention and control, the use of PPEs where necessary.
- Are responsible for using appropriate protective methods and equipment while working in areas where potential exposure to harmful radiation may occur.

3.12.1 Firefighting and Fire Prevention

All firefighting equipment and systems shall be installed and provided at Hospital. Sand buckets and fire extinguishers will be placed at various sensitive locations of Hospital during construction and operation phases. Emergency evacuation plans will be developed and implemented.

3.12.2 Details of PPEs

Table 3.4: Recommended PPEs for Various Hazards

Protection Required	Potential Hazard	Recommended PPEs
Head Protection	Falling objects, inadequate height clearance, and overhead power cords	Helmets with or without electrical protection
Hand protection	Hazardous material, cuts or lacerations, vibrations, extreme temperatures	Synthetic or Rubber gloves, leather, insulating material etc.
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation	Safety goggles, shield protective, etc.

Hearing protection	Noise	Hearing protectors like ear plugs, ear muffs
Respiratory protection	Dust, fogs, fumes, gases, smokes, vapors, oxygen deficiency	Facemasks or air supply
Body protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Aprons, insulating clothing etc. of appropriate materials
Foot Protection	Chemical/Biological, Compression, Impact, Electrical shock, Extreme heat/cold, cutting tools, Slippery/wet surface, fire/explosion	Safety shoes/boots according to hazard
Fall Protection (Work at height)	Severe injury, Disability and even death	Safety harness, lanyards and other gears designed to safeguard workers from fall

3.12.3 Safety Sign Boards

Safety signboards will be installed in potentially hazardous areas on a permanent or as-needed basis, such as high-noise zones, slippery surfaces, dusty environments etc.

3.12.4 First Aid

First aid training will be provided to the contract as well as contract employees. First aid boxes will be placed at different location at workplace.

3.12.5 Dengue Protection

SOP for dengue protection will be strictly followed. Admin Department will ensure on daily basis that there is no stagnant water at any place within or around the premises of GSH project site.

4. DESCRIPTION OF ENVIRONMENT

4.1 GENERAL

This section describes the baseline conditions, which covers all the relevant information on the current status of the environment of the Project Area. Information on these aspects has been derived from the desk study of available data, field visits to the project area as well as information obtained from official websites of Government departments and other relevant agencies.

The data regarding the physical environment was collected mainly within the project surroundings. In case of the biological and socioeconomic environment, efforts were made to collect the information within one Km around the project area and even up to 10 Km where any direct or indirect impacts were envisaged.

4.2 METHODOLOGY OF CONDUCTING BASELINE STUDY

Establishing the environmental baseline includes both the present and likely further state of the environment, taking into account changes resulting from natural events and other human activities, assuming the project is not undertaken – the no action alternative.

The guiding factors for the present baseline study are the EPA's requirements for the Environmental Impact Assessment and IEE/EIA Regulations 2022, local regulations and directives. The studies were conducted by considering both primary and secondary means i.e. by sampling, monitoring, observations and field verification along with review of past relevant EIA studies and literature survey.

The data generation were formulated with interdisciplinary team discussions, criteria questions, and professional judgment.

The baseline data provides the “base line” against which severity of the future impacts can be assessed.

4.3 BASELINE PHYSICAL ENVIRONMENT

This Section examines the physical resources such as topography, geology and soil, climate, surface and groundwater resources, wastewater effluent handling, noise levels and ambient air quality of not only the Project site but also the surroundings as a whole to assess whether the project under assessment can or does have any impact on any of these parameters.

4.3.1 Topography, Geology and Soil

Tehsil Mian Channu is located in the southern part of Khanewal District, Punjab Province. It occupies a strategic position along the National Highway (N-5) and the Karachi–Peshawar railway line, providing excellent connectivity to major urban centers within Punjab and across Pakistan. The area is characterized by fertile agricultural lands, an extensive irrigation

network, and scattered rural settlements, which collectively shape its geographical landscape and support its predominantly agrarian economy. The topography of the area is predominantly flat to gently undulating, which is characteristic of the alluvial plains of the Indus Basin. The terrain exhibits very little variation in elevation and is generally suitable for agricultural, residential, commercial, and industrial development. An extensive network of irrigation canals and distributaries traverses the area, supporting agricultural activities and influencing local drainage patterns.

The geology of the Tehsil is dominated by recent alluvial deposits of the Indus Plain. The area consists mainly of unconsolidated sediments, including sand, silt, clay, and gravel deposited over thousands of years by the Indus River system and its tributaries. These Quaternary-age alluvial deposits form thick sedimentary sequences underlying the region. The geology is relatively stable, with no major fault lines, volcanic activity, or significant geological hazards reported within the area. The alluvial deposits provide favorable conditions for groundwater storage and agricultural productivity.

The soils of the Tehsil are primarily alluvial in origin and are generally fertile due to the continuous deposition of nutrient-rich sediments. The dominant soil types range from sandy loam and salty loam to clay loam. These soils possess good water-holding capacity and are well suited for the cultivation of a variety of crops. In certain areas, intensive irrigation practices have resulted in localized issues of salinity and waterlogging; however, the majority of agricultural land remains productive. The fertile nature of the soil, combined with an extensive irrigation network, contributes significantly to the agricultural importance of the tehsil.

4.3.2 Seismology

Tehsil Mian Channu, located in Khanewal District of Punjab Province, lies within the alluvial plains of the Indus Basin and is characterized by relatively low seismic activity compared to the northern and western regions of Pakistan. According to the Building Code of Pakistan (Seismic Provisions), the area generally falls within a low to moderate seismic hazard zone.

No major active fault lines are known to pass through the immediate vicinity of Tehsil Mian Channu. However, as Pakistan is situated in a tectonically active region influenced by the collision of the Indian and Eurasian Plates, occasional tremors originating from distant seismic sources may be felt in the area.

The seismic risk in Tehsil Mian Channu is considered low, and the probability of severe earthquake-induced ground shaking is relatively limited. Nevertheless, all infrastructure and development projects should be designed and constructed in accordance with the applicable seismic provisions of the Building Code of Pakistan to ensure structural safety and resilience against potential earthquake events.

4.3.3 Land Use and Land Cover (LULC)

Land cover (LC) is defined as the physical properties on the lands surface for example forest, mountain and water. On the other land use (LU) is the change of LC due to the human actions and requirements such as roads and urban infrastructure. Land use and land cover (LULC) impact on the ecosystem processes, biodiversity, hydrology and climate due to human activities.

Transformation of one land-use type to another, may bring changes in surface energy, because different classes of LULC have different reflectance and evapotranspiration. Such rapid changes lead to significant changes in local climate, particularly having impacts on land surface temperature (LST) and local air temperature. The LST increases with decrease in vegetation and with increase in urban built-up and barren land.

Total area of Khanewal District is 4,349 square kilometers. Land classes are given in Table 4.1 whereas Table 4.2 illustrates the Land-use Distributions of District Khanewal in 1980, 2000 and 2020.

Table 4.1 Land Classes

Land Class	Description
Vegetation	Gardens, parks, and cultivable lands.
Urban area	Roads, buildings, and pavements etc.
Barren land	Harvested, fallow, and uncultivable land.
Water bodies	Rivers, canals, and ponds.

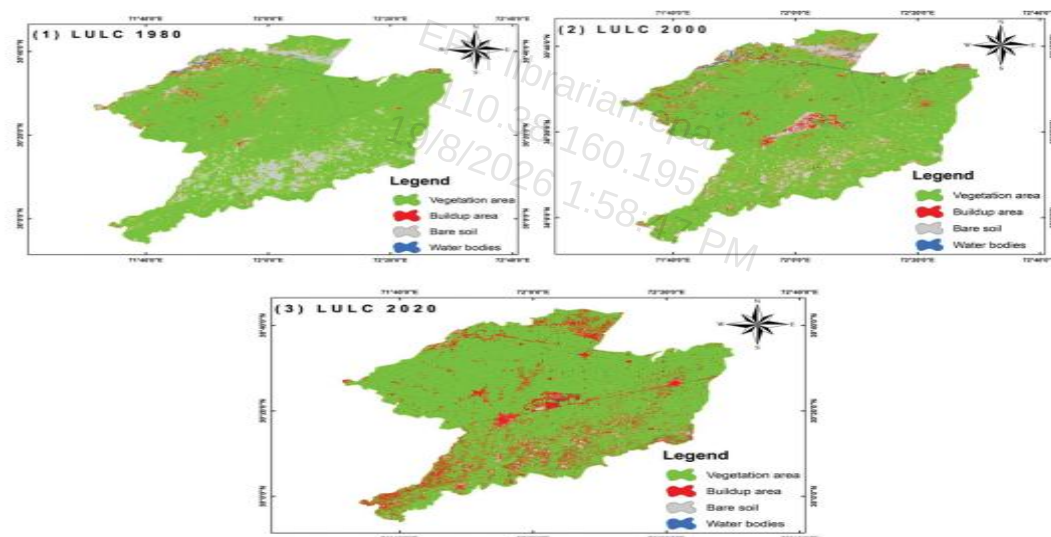


Figure 3. The LULC maps for the years 1980, 2000 and 2020 of district Khanewal.

Figure 4.1: The LULC maps for the years 1980, 2000 and 2020 of District Khanewal.

Table 4.2 Land-use Distributions of District Khanewal in 1980, 2000, 2020

LULC classes	1980		2000		2020	
	Ha	%	Ha	%	Ha	%
Vegetation	410622.21	94.15	404730.4	92.8	392654.65	90.03
Build-up area	7640.81	1.75	15266.18	3.5	30623.24	7.02
Bare soil	10578.01	2.43	9572.67	2.19	7625.3	1.75
Water bodies	7293.57	1.67	6565.35	1.51	5231.41	1.2
Total	436134.6	100	436134.6	100	436134.6	100

4.3.4 Climate

The project site in Mian Channu falls under hot long summers and mild short winters. The hot season lasts for 3.4 months, from April 23 to August 4, with an average daily high temperature above 98°F. The hottest month of the year in Miān Channūn is June, with an average high of 105°F and low of 84°F. The cool season lasts for 2.6 months, from December 5 to February 23, with an average daily high temperature below 75°F. The coldest month of the year in Mian Channun is January, with an average low of 43°F and high of 67°F.

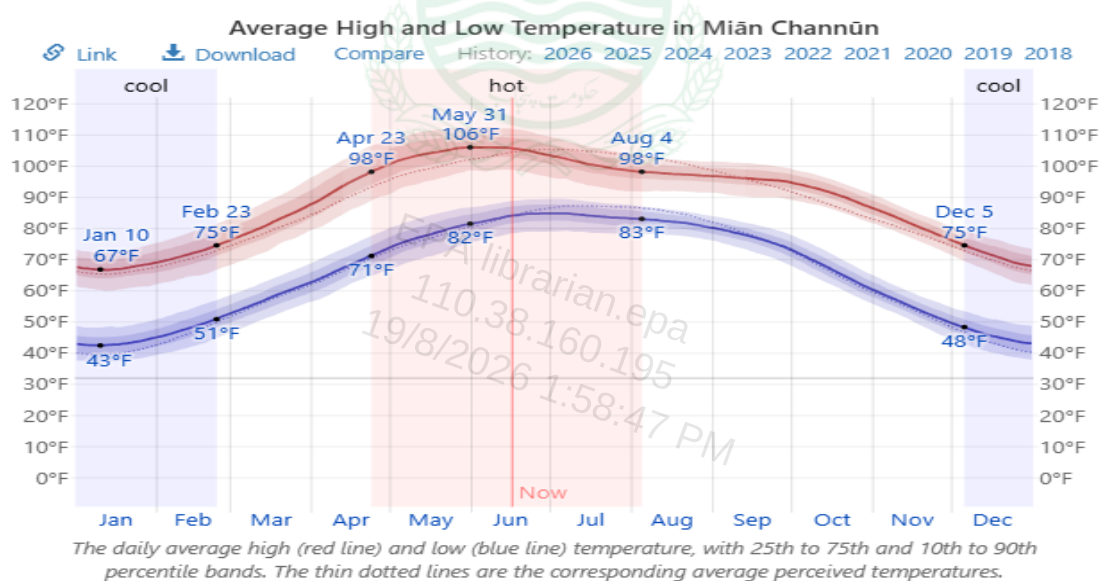


Figure 4-2: Temperature Data Mian Channu (Data Source: Weather Spark)

4.3.5 Rainfall

Mian Channu experiences *extreme* seasonal variation in monthly rainfall. The rainy period of the year lasts for 7.5 months, from February 14 to September 30, with a sliding 31-day rainfall of at least 0.5 inches. The month with the most rain in Mian Channun is July, with an average

rainfall of 1.5 inches. The rainless period of the year lasts for 4.5 months, from September 30 to February 14. The month with the least rain in Mian Channun is November, with an average rainfall of 0.1 inches.

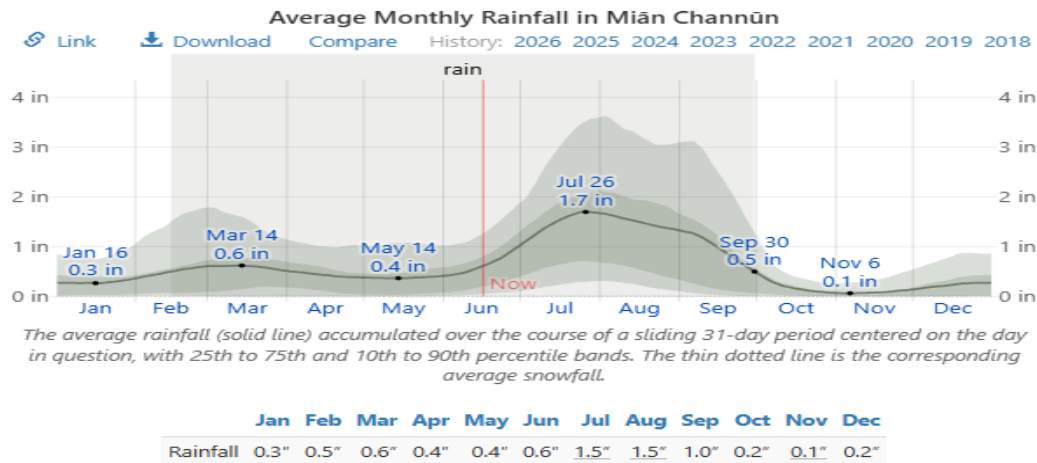


Figure 4-3: Average Monthly Rainfall of Mian Channu (Data Source: Weather Spark.com)

4.3.6 Humidity

Month-wise average humidity is illustrated in Figure 4.6

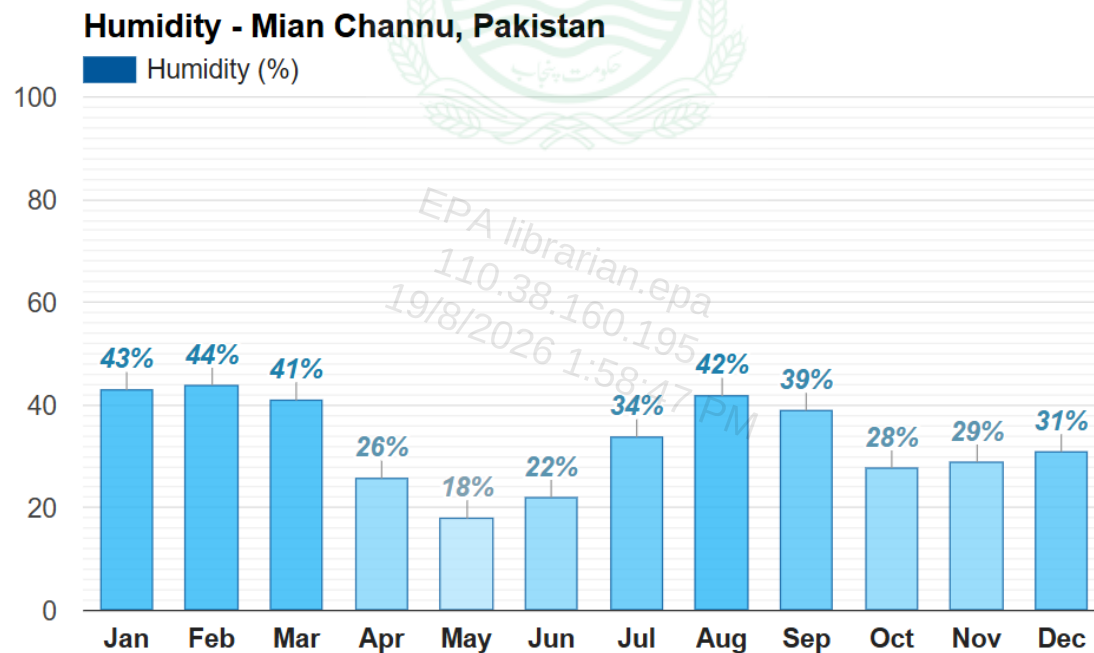


Figure 4-4: Average Humidity in Mian Channu (Data Source: Weather atlas)

4.3.7 Wind

The average hourly wind speed in Mian Channun experiences significant seasonal variation over the course of the year. The windier part of the year lasts for 3.9 months, from May 12 to September 9, with average wind speeds of more than 6.6 miles per hour. The windiest month of the year in Mian Channun is June, with an average hourly wind speed of 8.1 miles per hour. The calmer time of year lasts for 8.1 months, from September 9 to May 12. The calmest month of the year in Mian Channun is November, with an average hourly wind speed of 4.7 miles per hour.

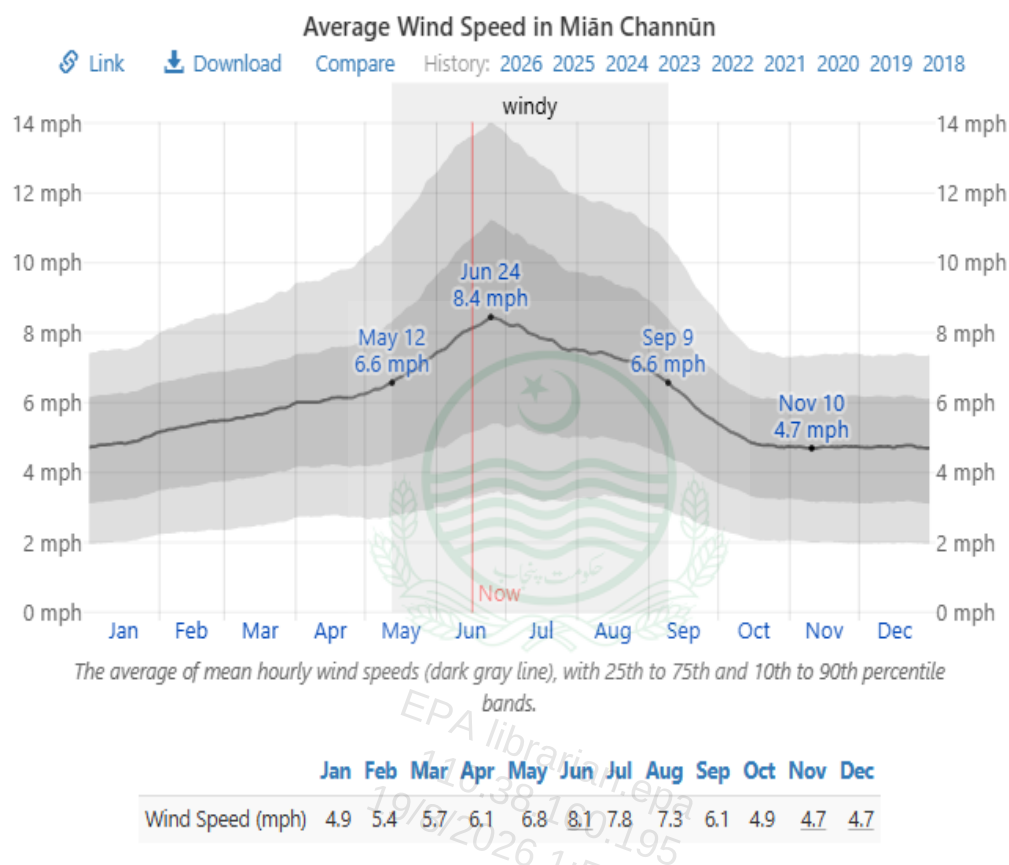


Figure 4-5 Average Wind Speed in Mian Channu (Data Source: Weather Spark.com)

The predominant average hourly wind direction in Mian Channu varies seasonally throughout the year. Winds are predominantly from the west for a short period of approximately 1.9 weeks, from early to mid-May, reaching a peak occurrence of 30% during the second week of May. From mid-May to the end of October, the prevailing wind direction shifts to the south, remaining dominant for about 5.5 months and peaking at 62% in mid-August. From the end of October to the first week of May, covering approximately 6.1 months, winds are predominantly from the north, with the highest frequency of 42% occurring during the first week of January.

4.3.8 Water Resources and Drains

4.3.8.1 Surface Water

An irrigation canal (Tulamba Minor) passes around 3–4 km northeast of Gul Sahib Hospital.

4.3.8.2 Groundwater

As shown in Figure 4.6, the underground water of Khanewal District is sweet, and complies with PEQS of drinking water. Tube wells, and hand pumps are used to extract groundwater.

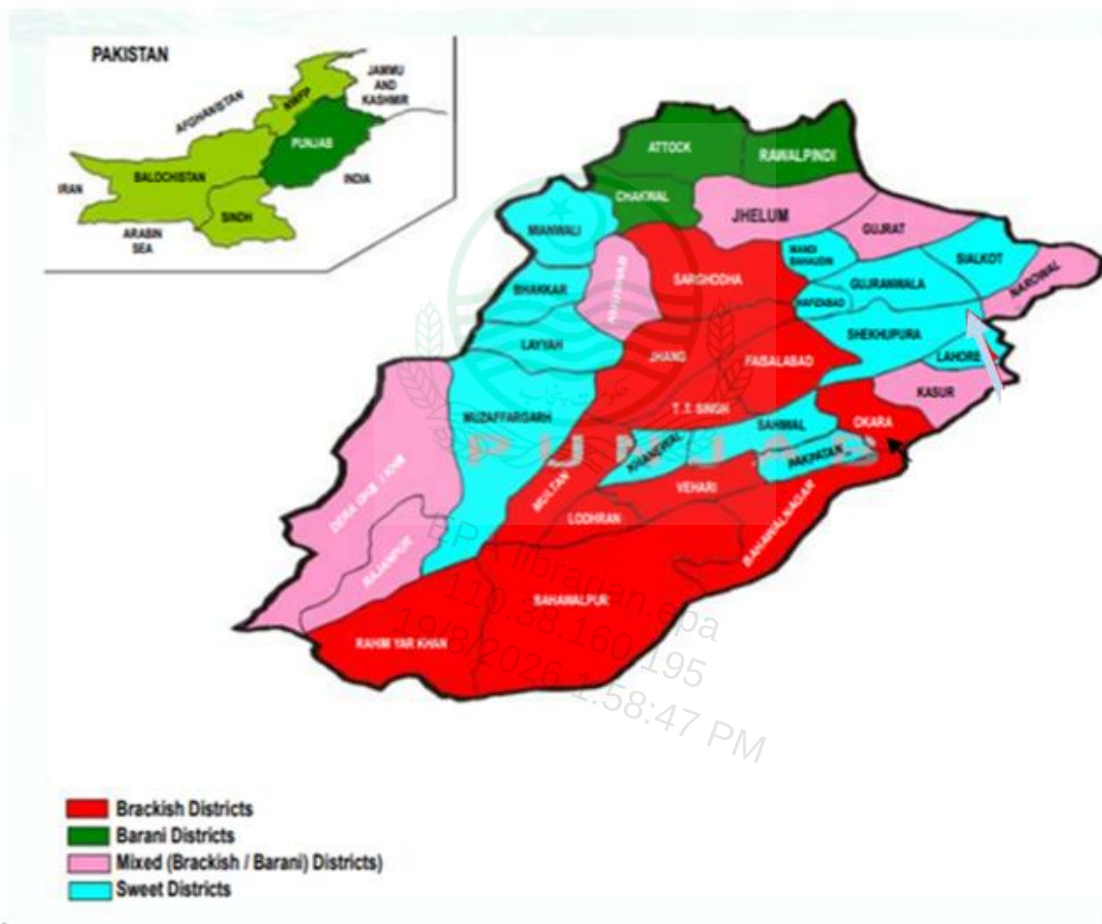


Figure 4.6 Quality of Water in Punjab

4.4 BIOLOGICAL ENVIRONMENT

4.4.1 Flora

The flora of the project area comprises natural vegetation as well as agricultural crops. The natural vegetation of the plains of Tehsil Mian Channu features native and planted trees:

Shisham (*Dalbergia sissoo*), Kikar (*Acacia arabica*), Neem (*Azadirachta indica*), Beri (*Ziziphus jujuba*), Bohr / Banyan (*Ficus indica*), Farash (*Tamarix articulata*).

The botanical landscape of the Tehsil is predominantly characterized by weed flora that competes for available soil nutrients. In addition, the area contains several medicinally important plant species..

Agricultural vegetation consists of seasonal crops such as wheat, cotton, rice, and maize, along with vegetable crops and fruit trees cultivated in the surrounding area.

4.4.2 Fauna

The fauna of Tehsil Mian Channu is primarily composed of common and widely distributed species adapted to agricultural ecosystems. No critical habitats, wildlife sanctuaries, national parks, or known populations of endangered fauna are reported within the immediate vicinity of the project area. However, local fauna contributes to ecological balance through pollination, pest control, and nutrient cycling within the agricultural landscape.

Common mammalian species are jackal (*Canis aureus*), Indian hare (*Lepus nigricollis*), house rat (*Rattus rattus*), field mouse, mongoose (*Herpestes edwardsii*), and various bat species. These animals are commonly associated with agricultural fields, orchards, and human settlements.

The avifauna of the area is relatively diverse and includes both resident and migratory bird species. Commonly observed birds include house sparrow (*Passer domesticus*), common myna (*Acridotheres tristis*), cattle egret (*Bubulcus ibis*), little egret (*Egretta garzetta*), dove species, crow (*Corvus splendens*), parakeet (*Psittacula krameri*), hoopoe (*Upupa epops*), and various species of ducks and waterfowl near canals and water bodies during the migratory season.

Reptiles commonly found in the area include garden lizards, house geckos, skinks, and non-venomous snake species. Amphibians such as frogs and toads are frequently encountered near irrigated fields, ponds, and canal networks, particularly during the monsoon season.

4.5 SOCIOECONOMIC ENVIRONMENT

4.5.1 Demographics

The population of Mian Channu Tehsil was determined (Census 2023) to be at 872,581 with 2.3% annual growth from 2017 to 2023. Gender-wise, 51% of the population is male, while 49% is female.

Table 4.3 Population of Tehsil Mian Channu

Name	Status	Population Census 1998-03-01	Population Census 2017-03-15	Population Census 2023-03-01
Mian Channu	Tehsil	548,026	761,955	872,581

Mian Channu Tehsil is with around 38% of its inhabitants are below the age of 15 years. Total area of Tehsil is 1212 Km² and Population density is 720/Km². The majority of people speak Punjabi (93.4%), followed by Urdu (3.3%), while Saraiki, Pashto, Mewati, Hindko, and other languages are also spoken.

4.5.2 Education

The literacy rate of Tehsil Mian Channu is 64.4%. Government Girls High English Medium School and Government High School are located within 0.5 km of the project site. In addition, a wide range of educational facilities is available in Mian Channu City, approximately 5–7 km from the project site.

4.5.3 Health Facilities

Healthcare services in the area are provided by both the public and private sectors, including the THQ Hospital in Mian Channu. The establishment of the GSH will significantly enhance the availability and quality of healthcare services in the region.



Figure 4.7: Tehsil Headquarter Hospital Mian Channu

4.6 SUITABILITY OF THE SITE

The proposed site was evaluated based on the following parameters and deemed suitable.

Table 4.4 Site Suitability

Parameters	Current Status
Dislocation, Resettlement, Rehabilitation, Infrastructure Clearing	Not Required
Land Legal Status	The land is legally owned by the proponent and has no legal obligations
Natural Hazards	Site is not prone to any natural hazard – flood, landslide or any other hazard
Hydrology or Waterways	Project will not alter/deteriorate surface hydrology or waterways
Sensitive or Protected area	Project site is not in or near any sensitive or protected area. There are no historical or archeological structures of any kind on or near the property.
Accessibility	The project site is conveniently accessible from all Pakistani towns and ports. The major highways including National Highway N5, and Motorways are easily accessible.
Utilities	Main Utilities are readily available.

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5. STAKEHOLDERS CONSULTATION

5.1 GENERAL

Any person, group or organization with an interest in the project or who can be affected directly or indirectly, negatively or positively by the project activities is a project stakeholder. There are two types of stakeholders - primary and secondary stakeholders. Primary stakeholders are those which are directly affected by the project activities and secondary stakeholders are those which are affected indirectly. Stakeholder consultation is a mean of involving the primary and secondary stakeholders in the project decision making process by getting feedback from the community and addressing their concerns.

Stakeholder consultation was therefore conducted in the project area, not only to comply with the obligation imposed by Punjab EPA for conducting EIA Study but also to improve and enhance the social and environmental design of the project and achieve the goal of sustainable development.

5.2 OBJECTIVE OF THE STAKEHOLDER'S CONSULTATION

Role of the public participation is very important in the design making process to achieve the goal of sustainable development. The major objectives of public consultation are as follows:

- Promote better understanding of the project, its objectives and its likely impacts and their management.
- Identify and address the concerns of all interested and affected parties of the project.
- Provide a mean to Identify and resolve issues before plans are finalized and development commences, thus avoiding public anger, resentment and potentially costly delays.
- Encourage transparency and inculcate trust among various stakeholders to promote cooperation and partnership with the communities and local leadership.

5.3 STAKEHOLDERS IDENTIFICATION

Identifying the stakeholders for the proposed project is crucial for its success as it helps to quantify and integrate the contributions of the various parties. Residents of neighboring communities of the project site are considered to be the primary stakeholders. Construction activities, if not properly performed, may cause damage to their health, stakeholders' crops and agriculture land. Therefore, their concerns should be incorporated into the EIA for both the construction and operational phases. Furthermore, employees involved in the operation and maintenance of the industry are at risk, if the industry is poorly designed or if inappropriate equipment or contractors are selected. Therefore, engaging GSH personnel as stakeholders and considering their suggestions is vital to avoid equipment failure or safety incidents. Projects should always leverage the expertise and vision of environmental and social experts to meet sustainability goals.

5.4 CONSULTATION PROCESS

Based on the discussion above, the following stakeholders should be engaged:

- Local Community (living in the vicinity of project site)
- Environment & Social Experts (Public and Private Institutes/Consulting Firms/Academia)
- Grass-root stakeholder discussions

Stakeholders were consulted during informal and formal meetings held in the project area. The consultation process was carried out in Urdu and native language. During these meetings, a simple, non-technical, description of the project was presented, with the overview of the project's likely human and environmental impacts. This was followed by an open discussion allowing participants to voice their concerns and opinion. Their feedback along with their major concerns and suggestions were documented for analysis and mitigation. Focus group discussions and in-depth interviews were also conducted. The issues recorded in the consultation were examined, validated, and addressed in the EIA report.

The consultation process will continue even after the EIA report submission to create consensus among the stakeholders on specific environmental and social issues in context of the project in order to incorporate sustainability in the on-going project.

It is important not to raise community expectation unnecessarily or unrealistically during the stakeholder consultation meetings in order to avoid undue conflicts with local administration

5.5 STAKEHOLDERS FEEDBACK

The consultation with various stakeholders is summarized in Tables 5.1 and 5.2.



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Table 5.1 Consultation with Stakeholders

Name	Designation	Organization	Concerns/Advice
Dr. Muhammed Aslam Nasir	Proponent	Gul Sahib Hospital, Tulamba, Mian Channu	- The establishment of GSH will enhance access to quality healthcare services in Tehsil Mian Channu and surrounding areas, thereby contributing to the social well-being of the local community. - Compliance with the provisions of the Punjab Hospital Waste Management Rules, 2014, will be ensured throughout the project lifecycle. - GSH will establish a dedicated Health, Safety, and Environment (HSE) Department responsible for developing HSE plans and implementing the Environmental Management Plan (EMP) prior to the commencement of construction activities. - GSH is committed to promoting environmental sustainability through the implementation of energy-efficient practices, water conservation measures, and tree plantation initiatives. - .

Mr. Ahsen Manzur	Managing Partner	M/s Design Matrix	- The proposed buildings are being designed as per FGI-2018 (Guidelines for design and construction of Hospitals) in addition to other International and National standards and Codes. -
Mrs. Maham Ayesha	Environmentalist	Lahore	- She expressed concerns regarding occupational health and safety risks associated with the handling of infectious materials and hazardous chemicals. She recommended the provision of appropriate personal protective equipment (PPE), regular staff training, and periodic occupational health surveillance to safeguard workers' health and safety..
Hafiz Nasir Anwer Khan	Director	Powerlink Engineering, Lahore	- He highlighted his concern over medical waste disposal and stressed the need to prevent theft, or scavenging, recycling or unauthorized reuse of hazardous waste by individuals. - He was informed that the hazardous waste shall be disposed of through an EPA approved contractor and incinerated at contractor's off-site facility.

Dr. Naveed Ramzan	Dean Engineering	UET, Lahore	- Use of natural light in building design should be ensured which in addition to energy conservation, may improve the patients' recovery process and reduce the length of stay (LOS) in hospital. - GSH should prepare and implement a Safety Plan of all chemicals based on their MSDS
Mr. Adeel Ahmad	Production Manager	Fatimafert Ltd, Lahore	- Develop green belts around the hospital premises to reduce dust and improve the surrounding air environment. - Ensure outdoor pollution sources are located away from fresh-air intake points. - Maintain appropriate indoor air quality through the installation of an efficient HVAC system. (Electrically operated)
Mr. Talha	Environmentalist	Lahore	- He raised concern over risk of soil, surface water, and groundwater contamination from wastewater and hazardous waste if not properly managed. - He suggested to install and maintain an efficient wastewater treatment system and regularly monitor effluent quality before discharge.

			- He was informed that GSH will install an Effluent Treatment Plant (ETP) comprising pre-treatment, primary, secondary, and tertiary treatment processes, along with a disinfection system, to effectively address this concern.
Syed Nihal Asghar	Director,	M/s Seal Lahore	- Establish a comprehensive environmental monitoring program and publicly disclose key environmental performance indicators. - Adopt water conservation measures, rainwater harvesting, and water-efficient fixtures.
Mr. Ijaz Ahmad	Sr. Manager HSE (Ex)	FFC, Karachi	- He pointed out the significance of Emergency preparedness for chemical spills, fire incidents, and infectious disease outbreaks. He suggested to develop and regularly update emergency response and contingency plans; conduct staff training and mock drills. -
General Public			-

5.5.1 Public Consultation

Consultations were conducted with residents living near the project area, and feedback was also collected from the wider public. A summary of the public consultation findings is provided below.

- Most members of the local community emphasized that preference should be given to local residents for employment opportunities during both the construction and operational phases of the hospital.
- The general public widely welcomed the establishment of the hospital in the area, noting that it would significantly reduce the need for patients to travel to distant cities to access quality healthcare services.
- They appreciated that GSH will provide healthcare services to deserving patients regardless of their financial capacity, ensuring equitable access to medical treatment.
- Concerns were raised regarding the potential increase in traffic congestion and the risk of road accidents resulting from construction activities and increased vehicular movement during the operational phase.

Table 5.2 Consultation with General Public

	Name	Location/	CNIC	Phone
1	Abid Hussain	Iqbal Nagar	36501-5683095-5	0301-1191114
2	M. Waseem	Tulamba	36104-8972817-1	0304-8889598
3	Ansar Hussain	Tulamba	36104-9270266-3	0309-7901466
4	Danish Abbas	Kassowal		0346-551248
5	M. Arshad	Iqbal Nagar		0305-5284870
6	Abdul Kareem	Tulamba	36104-6792044-7	0327-6791207
7	Sajid Ali	Iqbal Nagar	36501-4380595-5	0301-6920752
8	M. Danish	Iqbal Nagar		0301-6857931
9	Mazhar Sail	14/8AR		0310-2974882
10	Waseem Asraf	Tulamba	36104-8437992-3	0324-6275918
11	Samiullah	Kot Barkat Ali	36104-0616285-5	0300-4749727
12	Munib Ur Rehman	Kot Barkat Ali		0301-6997229
13	M. Rehan	Kot Barkat Ali		0300-4564540

6. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATIONS

6.1 GENERAL

This section addresses the Project's potential impacts on physical, biological and socio-economic environment of the area that may be encountered during preconstruction, construction and operations phases. Impacts have been predicted and assessed. Where applicable, mitigation measures have been suggested to be implemented in order to reduce the adverse impacts, if not eliminated. It is aimed to:

- Find different alternatives and ways of doing the project activities.
- Enhance the environmental and social benefits of proposal.
- Avoid, minimize and remediate adverse impacts.
- Ensure that residual adverse impacts are kept in acceptable limits

6.2 IMPACT ASSESSMENT METHODOLOGY

Based on site visits, observations, brainstorming sessions, provided data, and social interviews, significant impacts were evaluated considering both technical and regulatory concerns. A qualitative and, where possible, quantitative assessment of these anticipated impacts was conducted. Various EIA methodologies are available for impact identification, including checklists, interaction matrices, networks, and overlays. For the impact assessment of the proposed project, the Project Interaction Matrix method was utilized.

6.2.1 Project Interaction Matrix

An interaction matrix is a two-dimensional framework in which project activities are listed along y- axis, while the x- axis includes various environmental parameters that may be affected by the proposed project activities. These parameters are grouped into categories such as Physical, Ecological, and Socioeconomic. A matrix was developed for the proposed Project which relates Project's activities with various components of the environment. The impacts were ranked with respect to their severity as under:

High negative impact	- 2	No impact	N
Low negative	-1	Low positive impact	+ 1
Insignificant impact	0	High positive impact	+2
	NA	Not applicable	

Table 6.1 illustrates the Impact Matrix for the proposed project.

Before suggesting mitigation measures, following six impacts were categorized as moderate to highly negative in severity. These impacts were considered to be significant and mainly focused in EIA.

- Air Quality
- Noise
- Health Hazards mainly due to inappropriate waste management and chemicals handling
- Safety Hazards: Handling of waste; construction and operation activities,
- Soil Contamination
- Water contamination

Table 6-1: Environmental Impact Matrix

Project Activities	Physical							Ecological												
	Soil	Air Quality	Surface Water (Quality)	Groundwater	Water Consumption	Topography	Noise and Vibration	Natural Vegetation	Terrestrial Fauna	Reduction of Biodiversity		Living Standard of Community	Livelihood of Community	Cultural Issues	Public Safety	Employment	Traffic congestion	Occupational Health and Safety	Gender Issues	Site Aesthetic
Preconstruction Phase																				
Project Location (Poor selection has adverse impact)	-1	0	-1	-1	0	-1	0	-1	-1	-1		+ 1	+1	- 1	-1	+1	-1	-1	-1	-1
Design (Positive impact of appropriate design)	N	+1	+1	+1	+1	0	+1	0	N	N		N	N	N	+1	0	0	+2	N	+1
Construction Phase																				
Contractor Mobilization	-1	-1	-1	0	0	-1	-1	-1	-1	-1		0	0	-1	-2	+1	-1	-1	NA	-1
Site Establishment Activities	-1	-1	-1	-1	0	-1	-2	-2	-1	-1		0	0	N	0	+1	0	-1	NA	-1
Transportation of Construction Material	- 2	-1	-1	-1	0	-1	-1	-1	0	0		0	0	0	-2	0	-1	-1	NA	-2

EIA- Establishment of Gul Sahib Hospital, Tulamba, Mian Channu

Transportation of Plant Equipment	-1	-1	0	0	0	0	-1	0	0	0		0	0	0	-1	0	-1	-1	N	-1	
	Soil	Air Quality	Surface Water (Quantity/Quality)	Groundwater	Water Consumption	Topography	Noise and Vibration	Natural Vegetation/Trees		Terrestrial Fauna	Reduction of Biodiversity	Living Standard of Community	Livelihood of Community	Cultural Issues	Public Safety	Employment	Traffic congestion	Occupational Safety & Health	Gender Issues	Site Aesthetic	
Excavation	-2	-2	-1	-1	0	-2	-1	-1		0	-1	N	0	N	0	+1	0	-1	N	-2	
Machinery, Generators Operation	-1	-2	-1	-1	0	0	-2	-1		0	-1	0	0	N	0	+1	0	-1	N	-1	
Construction of buildings	-1	-1	-1	0	-1	0	-1	-1		0	-1	+1	+1	N	0	+2	-1	-1	N	-1	
Installation of Hospital equipment	0	-1	0	N	N	0	-1	N		N	0	0	+1	N	0	+1	0	-1	N	0	
Solid Waste disposal	-2	-1	-1	-1	N	-1	0	0		-1	0	-1	-1	N	-1	N	N	-1	N	-1	
Effluent disposal	-2	-1	-1	-2	N	-1	N	0		-1	-1	-1	-1	N	-1	N	N	-2	N	-2	
Contractor's Demobilization	-1	-1	-1	-1	0	0	-1	0		-1	-1	0	0	N	-1	-1	-1	-1	N	0	
Restoration	+2	0	0	0	0	+1	0	+1		0	+1	N	N	N	0	0	0	0	N	+2	

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Project Activities	Physical							Biological			Social and Socioeconomic											
	Soil	Air Quality	Surface Water	Groundwater	Noise	Water Consumption		Vegetation/Trees		Terrestrial Fauna		Living Standard of Community	Livelihood of Community	Cultural Issues	Public Safety	Community Health	Employment	Traffic congestion	Occupational Health and Safety	Gender Issues		Site Aesthetic
Operational Phase																						
Operations activities	-2	-2	-1	-1	-2	0		0		0		+1	+1	-1	-1	-1	+2	-1	-2	-1		+1
Hospital Waste Disposal	-2	-1	-1	-2	N	N		-1		-1		-1	0	N	N	-1	N	0	-2	N		-1
Chemicals handling	-2	-1	-1	-2	0	0		0		0		N	N	N	0	-1	0	0	-2	NA		N
Wastewater disposal	-2	-1	-1	-2	N	-1		-1		-1		-1	0	0	N	-1	N	0	-1	N		-1

Note: Key: -2: High negative impact; -1: Low negative impact; 0: insignificant/negligible impact; +1: low positive impact; +2: High positive impact, N: no impact. NA Not applicable;

6.3 IMPACT CHARACTERIZATION

Impacts are characterized on the basis of significance, probability and prevalence of the potential impacts on the surrounding environment. Primarily, anticipated impacts have been categorized as:

- Direct or Indirect
- Positive or Negative
- Local or Widespread
- Reversible or Irreversible
- Probability (Unlikely, Likely, Certain)
- Severity (Low, Medium, High)

6.3.1 Significance of Impact

Significance of impact is assessed as low, medium and high based on Impact consequences severity and likelihood (Table 6.2), reversibility, impact duration, public concern and mainly the compliance with the EPA Rules and Regulations.

Table 6-2: Impact Assessment

Probability of Impact Occurrence	Impact Severity			
		Mild	Moderate	High
		1	2	3
Unlikely	1	Low Significance	Low Significance	Medium Significance
Likely	2	Low Significance	Medium Significance	High Significance
Certain	3	Medium Significance	High Significance	High Significance

Summary of characterization and significance is summarized in Table 6.3 and 6.4

Table 6-3: Summary of Characterization and Significance of Impacts for Construction Phase.

	Air Quality	Noise	Health Hazard	Safety Hazard	Soil Contamination	Water Contamination
Direct and indirect	Direct	Direct	Direct	Direct	Direct	Indirect
Positive and negative	Negative	Negative	Negative	Negative	Negative	Negative
Local or widespread	Local	Local	Local	Local	Local	widespread
Short- or long-term	Short	Both	Both	Short	Short	Short
Reversible or Irreversible	Reversible	Both	Both	Both	Reversible	Reversible
Severity	Moderate	Moderate	Moderate	High	Moderate	Moderate
Probability	Likely	Likely	Likely	Likely	Likely	Likely
Significance	Medium	Medium	Medium	High	Medium	Medium

Table 6-4: Summary of Characterization and Significance of Impacts for Operation Phase

	Air Quality	Noise	Health Hazard	Safety Hazard	Soil Contamination	Water Contamination
Direct and indirect	Direct	Direct	Direct	Direct	Direct	Indirect
Positive and negative	Negative	Negative	Negative	Negative	Negative	Negative
Local or widespread	Local and widespread	Local	Local	Both	Local	Widespread
Short- or long-term	Short term	Both	Both	Both	both	Long Term
Reversible or Irreversible	Reversible	Both	Both	Both	Reversible	Both
Severity	Moderate	Medium	High	High	High	High
Probability	Likely	Likely	Likely	Likely	Likely	Likely
Significance	Medium	Medium	High	High	High	High

6.4 IMPACTS ASSOCIATED WITH PROJECT LOCATION

Potential Impact:

Environmental and social impacts may arise with poor siting and improper land acquisition. Impact significance can be high.

Mitigation

Negative impacts have been mitigated by investigating following parameters:

<u>Parameters</u>	<u>Project Site</u>
Dislocation, Resettlement, Rehabilitation, Infrastructure Clearing	Not Required
Land Legal Status	No legal obligations or case in any court
Land ownership	Proponent legally owns project land
Natural Hazards	Site is not prone to any natural hazard – flood, landslide or any other hazard
Hydrology or Waterways	Project will not alter/deteriorate surface hydrology or waterways
Sensitive or Protected area	Project site is not in or near any sensitive or protected area. There are no historical or archeological structures of any kind on or near the property.
Accessibility	The project site is easily accessible through Tulamba –Mian Channu Road, National Highway (N5) and Motorway for all towns across Pakistan.
Suitability	The project site is located within the proponent's native area, reflecting his commitment to promoting the welfare and development of the local community.
Availability of Basic Utilities	WAPDA power is available. Groundwater of sufficient quantity and appropriate quality is available. Ample space is available for installation of proposed solar power system.
Availability of workforce	The required number of workers with the right skill are easily available from Tulamba, Mian Channu. Staff hostel will also be available within the hospital.

Residual Impact

Impacts significance pertaining to Project location will reduce to low significance

6.5 IMPACTS ASSOCIATED WITH DESIGN

Potential Impacts

Impacts that may be addressed during design phase include:

- Physical trauma associated with failure of building structure
- Energy Conservation
- Water Conservation/Water quality
- Appropriate waste disposal system
- Sustainability considerations such as rain water harvesting, use of green chemistry etc.
- Safety and health hazards – including firefighting system, emergency exits,
- Selection of Technology and equipment
- Proper layout
- Infrastructure
- Parking

Reduction of potential hazards is best accomplished during the design phase when the structural design, layout, technology selection and site modifications can be adapted more easily.

Impact is of High negative significance prior to mitigation.

Mitigation Measures

The following issues should be considered in the planning, siting, and design phases of a project.

- Inclusion of buffer strips or other methods of physical separation around project sites to protect the public from major hazards associated with hazardous materials incidents or process failure, as well as nuisance issues related to noise, odors, or other emissions
- Incorporation of siting and safety engineering criteria to prevent failures due to natural risks posed by earthquakes, wind, flooding, landslides and fire. To this end, all project structures should be designed in accordance with engineering and design criteria mandated by site-specific risks, including but not limited to seismic activity, slope stability, wind loading, and other dynamic loads.
- Application of locally regulated or internationally recognized building codes to ensure structures are designed and constructed in accordance

with sound architectural and engineering practice, including aspects of fire prevention and response

- Address the concerns relevant to lighting, sound, water quality, plant layout.
- The proposed buildings are being designed as per FGI-2018 (Guidelines for design and construction of Hospitals) in addition to other guidelines of International and National standards and Codes such as American Institute of Architects (AIA) and American Society for Healthcare Engineering (ASHE).
-
-

6.6 IMPACTS ASSOCIATED WITH CONSTRUCTION PHASE

The Impacts associated with the construction activities of the proposed project are:

- Impacts on Physical Environment
- Impacts on Biological Environment
- Socioeconomic Impacts

6.6.1 Impact on Physical Environment

6.6.1.1 *Impact on Soil and Topography*

Potential Impact

Soil of the Project site may be affected by earthworks including excavation, dumping of construction debris, leveling of the site; installation of water drainage channels; spillage of fuel and oil from construction machinery, transportation and storage; silt-water from concrete batching and accidental leakage of chemicals to be used.

The likely impacts of these activities may include:

- Localized changes to topography
- Soil erosion, Physical scarring of the landscape.
- Increased risk of land slippage.
- Increased sediment load in surface run off.
- Soil contamination

Mitigation Measures

- Good engineering practices will help control soil erosion.
- Excavation work should be sprayed with water.

- Spill Prevention and Response Plan for storage, use and transfer of fuel and hazardous materials should be prepared.
- Workers should be trained on spill prevention and response plan.
- Fuels, lubricants and chemicals should be stored in covered areas, underlain with impervious lining.
- Maintenance and washing of vehicles and equipment should be carried out at designated areas.
- Regular inspections should be carried out to detect leakages in construction vehicles and equipment. Their scheduled maintenance should be carried out.
- Appropriate arrangements, including shovels, plastic bags and absorbent materials, should be available near fuel storage areas.
- Document all related incidents of spillage to take corrective actions and to avoid recurrence.

Residual impacts:

The implementation of above-mentioned measures is expected to reduce the adverse effects within low range.

Monitoring requirement:

Soil of the construction site should be visually inspected for any adverse effect and its mitigation on daily basis by Contractor's Engineer/Supervisor.

6.6.1.2 Water Consumption

Potential Impact

Water during construction phase will be required mainly for domestic water consumption at the construction camp and for the construction activities.

An adverse impact on the water resources is not expected as water consumption is low and construction phase is for a short period.

Mitigation Measures:

Water supply will be from tube-well. Water conservation program will be initiated to prevent wastage of water.

Residual Impact

No residual impact is expected.

6.6.1.3 Surface Water and Groundwater Contamination

Potential Impact

The quality of surface and groundwater supplies may deteriorate in case pollutants mix with surface runoff during rain are carried to water resources in the vicinity, or if pollutants leach into the ground. Potential sources of pollution in such cases may include:

- Domestic waste (sanitary and kitchen discharge)
- Oil and grease from vehicles and construction machinery
- Sediments from altered land surfaces
- Spillage of fuel or chemicals on ground

Chemicals in fuel and oil can quickly move through soil and pollute groundwater. A significant impact on the groundwater will be interpreted if construction material and other pollutants are not effectively controlled.

Mitigation Measures

- Effluents from Construction camp will be diverted through sewerage channels to Septic Tank.
- Fuels, lubricants and chemicals will be stored in areas with impervious floors. The accidental spills should be handled in accordance with the relevant SOPs.
- The scheduled maintenance of vehicles and construction machinery shall be carried out to prevent fuel and oil leakages. Fueling and vehicles washing will be carried out at designated areas.
- Recently groundwater has been analyzed for various parameters which will be used as a base case.

Residual Impact

Low scale residual impact is predicted if mitigation measures are incorporated.

Monitoring Requirement

The Contractor's mechanical crew will closely monitor any leakages from vehicles and machineries on regular basis. Groundwater will be analyzed for parameters of drinking water PEQS on quarterly basis during Construction Phase.

6.6.1.4 Air Quality

Potential Impact

During the construction phase, major sources of potential impacts on air quality are:

- **Dust emissions** generated from civil work and transportation of construction material.

- Wind during construction shift the dust to neighboring area and make the situation worse.
- The movement of heavy machinery and vehicles on the dirt tracks also causes dust emissions.
- **Exhaust emissions of** CO, NO_x, SO₂ and particulates from diesel generators, construction machinery/vehicles (like batching plants, excavators, dump trucks, and other transport vehicles) can pose significant adverse impact on health and environment when the emissions are not in compliance with PEQS.
- The other construction activities which can pose occupational health hazards are welding, metal cutting and painting fumes.
- Moreover, the possibility of exhaust emissions increases when vehicles and equipment are utilized without scheduled maintenance.

Potential impact is of moderate significance.

Mitigation Measures

To make the construction activities lawful and neighbor friendly, following are the practical ways to control nuisance:

- Dampening of material and unsurfaced roads. The most effective means of reducing the dust emission is wet suppression. Use water sprays and commence landscaping as early as practicable.
- Haul trucks carrying earth, sand, aggregate, and other materials should be kept covered during transportation of materials with tarpaulin.
- Dust emission from soil piles and aggregate storage stockpiles will be reduced by covering the piles, for example with tarpaulin or thick plastic sheet.
- Restricting dust generating activities during extremely dry or windy days.
- Construction materials that are susceptible to dust formation will be transported only in securely covered trucks to prevent dust emission during transportation. Restrict vehicles speed.
- Provision of dust respirators to equipment operators and other permanent and contract employees who are exposed to dust.
- Use of vehicles, machinery and generators with high combustion efficiency. Scheduled maintenance will be carried out to meet specifications of the Manufacturer as to minimize the emissions. Do not leave machinery, vehicle or equipment running when not in use.
- (Before and during the building works, all excavations must be fenced or otherwise guarded against being a danger to the life or property.)
- Welders, painters and their co-workers should understand the hazards of material they are working with. (Prolonged exposure of fumes may cause

serious health complications.) They should be enforced to wear PPEs. Develop SOPs for welding including relevant guidelines of OSHA.

Residual Impact

- After taking mitigation measures, impact is assessed to be of low to moderate significance.

Monitoring requirements

- Dust emission will be visually monitored on regular basis
- Ambient air quality will be checked for CO, NO_x, SO₂ and **particulates** near or at project site on quarterly basis.

6.6.1.5 Noise

Potential Impacts

The potential sources of significant noise include the construction machinery, generators at camps and construction related traffic, crushing, scaffolding and radios and mobile phones. The noise will be maximum during the day time when construction and operational activities are ongoing.

The noises loud enough to impair someone's hearing will contribute to hearing loss and accidents when can't hear the alarm.

Loud sound levels at workplace leads to unhappy workers.

Impact is of moderate significance and preventable.

Mitigation Measures:

- Noise hazards are addressed in OSHA standards for construction.
 - Use low noise machinery (use of silencer and mufflers) which is properly maintained and operated.
 - Fit an acoustic enclosure if machine is stationary.
 - Switch off all equipment when not in use.
 - For scaffolding, reduce drop from heights.
 - Keep the music volume of radio or mobile phone down
 - Provide sound related PPEs to the workers.
-
- Noise levels shall be controlled within PEQS limits as monitored near the project boundaries. For noisy areas, the workers must use hearing protective devices such as ear muffs, ear plugs.

- Place Warning Sign Boards at high sound level areas.

Residual Impact

Low residual impact is expected after taking mitigation measures however use of ear muffs or ear plugs are essential where sound levels are above the PEQS.

Monitoring requirement

Monitoring of ambient sound levels and machinery generated noise will be done by Contractor's Inspection engineer in coordination with GSH's HSE Engineer on quarterly basis to avoid increase in noise level beyond PEQS limits.

6.6.1.6 Solid Waste Management

Potential Impacts

Solid waste during Construction Phase is classified as domestic solid waste, packaging waste, construction waste (includes cables, copper, empty containers, steel etc.) and excavated material. Other waste includes oily rags, used air and oil filters, waste fluorescent and used cartridge etc. The waste if inadequately managed, can cause health hazard and contamination of soil and groundwater.

Impact is of moderate negative significance

Mitigation Measures

- Site Waste Management Plan (SWMP) shall be prepared and implemented by the Construction Contractor that details the amount and type of waste that will be produced at construction site and how it will be reused, recycled or disposed of at a legitimate site.
- Solid waste will be segregated at the source - Concrete, Steel, Wood, Plastic, Soil, Masonry and hazardous waste. Reuse or dispose of accordingly,
- Concrete waste can be crushed and reused as road base/sub-base, backfilling material, drainage layers, aggregate replacement etc.,
- Hazardous waste will not be mixed with no-hazardous waste.
- Wastage of any useable material will be strictly controlled.
- Domestic waste will be disposed of through local MC waste management system.
- Packaging waste and saleable construction waste will be sold.
- Hazardous waste will be disposed of through an EPA approved contractor.

Residual Impact

Impact can be significantly reduced to low intensity provided the above-mentioned mitigations are appropriately incorporated.

Monitoring Requirements

The Contractor's site engineer will monitor and ensure the good practices of SWMP at Construction site.

6.6.1.7 Occupational Health and Safety

Occupational health and safety hazards include:

- Over exertion
- Slips and Falls
- Work on height
- Struck by objects
- Moving Machinery
- Dust
- Confined Spaces and Excavations, other site hazards such as exposure to dust, chemicals, hazardous or flammable materials, and wastes in a combination of liquid, solid, or gaseous forms
- People from the project area cannot be considered isolated from the rest of the country. They are regularly exposed to illnesses common to other populations and have similar levels of immunity.

Impact before mitigation is of high significance.

Mitigation Measures

- Enforce the use of PPEs
- Ensure the use of SOPs for work on height and in confined space and excavations.
- Manage proper housekeeping to avoid safety incidents.
- Excavation sites should be barricaded.
- Provision of appropriate warning sign boards at near work site.
- Spray water to suppress the dust as required.
- Limit vehicles' speed at 20 Km/hr.
- Prevent leakages of fuel and oil
- Ensure appropriate solid and liquid waste handling and disposal.
- Fire prevention and evacuation plans for Construction Phase should be implemented.
- Ensure first aid boxes are available at the construction site and provide first aid training to the contractor's staff.
- Implement SOP for dengue prevention and control.

Residual Impact

Impact of low to medium significance is expected after implementing mitigation measures.

6.6.1.8 Vegetation/Trees Loss

Potential Impact

During construction phase, cutting or removal of trees is not required.

Potential impact is of low significance.

Mitigation Measures

- No tree cutting is involved during construction phase. However, if tree cutting becomes essential during project lifecycle, prior permission will be obtained from the concerned department.
- Plant native tree and shrub species to compensate for any vegetation removed.
- Landscaping will be done after construction phase
- Remove and store topsoil separately during excavation. Reuse the topsoil for landscaping and green areas after construction
- Maintain a record of new planted trees for follow up and maintain their growth

Residual Impact

Positive impact.

Monitoring

Planting and maintaining trees will be monitored by GSH's Admin Officer.

6.6.1.9 Impact on Fauna

Heavy traffic and construction activities may disturb the local fauna.

Potential impact is of low-medium significance.

Mitigation

- Avoid unnecessary disturbance by limiting construction activities to daylight hours as far as practicable. Reduce excessive noise and vibration from machinery.
- Inspect the site for bird nests, burrows, or other wildlife shelters before clearing. Relocate small fauna safely, where permitted by local regulations.
- Store food waste and construction waste in covered containers.
- Prohibit feeding or attracting wildlife.
- Trees plantation
- Limit vehicles speed below 20 Km per hr.

6.6.2 Socio-Economic Impacts

6.6.2.1 Land Use

Potential Impact

Positive effects are anticipated since the land use will create jobs and boost the nation's economy when in operation

Mitigation Measures

Tree Plantation

Residual Impact

Overall positive impact.

Monitoring Measures

Project Manager will ensure restoration of site by the Contractor. Admin Manager will ensure plantation of new trees and monitor their growth.

6.6.2.2 Impact on Livelihood of Local Communities

Potential Impact

The construction phase will generate employment. The project will provide the communities with the opportunity to expand their existing businesses such as restaurants, transport.

Overall, it will pose a positive impact on livelihood of local communities.

Mitigation Measures

- Local community would be preferred for employment of unskilled labor. They may also be given priority as semi-skilled and skilled workforce if they qualify the job criteria.
- Training will be provided to the unskilled local workers.
- The condition of hiring from local community will be included in the contract with the Construction contractor/s.

Residual Impact

Overall positive impact

6.6.2.3 Community Health and Safety

Potential Impact

Inappropriate management of solid waste, wastewater, emissions, and mainly noise and traffic may pose a threat to the community. There will be a temporary increase in traffic due to the construction activities of the proposed development, however this will cease once the development is completed.

The potential health impacts are low; however, the safety impact on the local community could be considered of moderate to high significance due to the transportation of construction material and hospital equipment.

Mitigation Measures

- Unauthorized entry to the construction site will be restricted and barricaded where required.
- Environment management will ensure that all waste disposal, air emissions and noise from construction activities comply with EPA rules, PEQS and Safety Standards.
- To reduce road accidents involving project vehicles during construction, avoid activities during heavy traffic at office and schools timings.
- Provision of appropriate warning sign boards at near work site and roads where necessary

Residual Impact

Impact after mitigation measure is expected to be within low-moderate significance.

6.6.2.4 Traffic Annoyance

Potential Impact

Transportation of construction material and plant equipment and machinery may create traffic congestion causing problems to the workers and the local community.

Mitigation

- The required material and equipment will not be transported at peak working hours to avoid traffic congestion and avoid accidents.
- Ensure that drivers possess valid driving license.

Residual Impact

The significance will be minimal after implementing the mitigation measures

Monitoring

Contractor and GSH's Admin Department will monitor the implementation of traffic control plan for construction phase.

6.7 IMPACTS ASSOCIATED WITH OPERATIONAL PHASE

6.7.1 Air Quality

Potential Impact

Air quality deterioration due to the release of contaminants into the work place can result in possible respiratory irritation, discomfort, or illness to workers. Employers should take appropriate measures to maintain air quality in the work area.

Sources of air emissions at Healthcare Facility may include (IFC EHS Guidelines for Healthcare Facilities)

- Exhaust air from heating, ventilation, and air conditioning (HVAC) systems, - if fuel is used. No emissions if it is electrically operated.
- Ventilation of medical gases and fugitive emissions release from sources such as medical waste storage areas, medical technology areas, and isolation wards.
- Exhaust air (e.g. from medical technology areas [MTAs], including isolation wards, laboratories, and waste storage and treatment facilities) may be potentially contaminated with biological agents, pathogens, or other toxic materials
- Emissions may also include exhaust from:
 - Medical waste incineration (Not to be carried out at GSH)
 - Vehicles entering the parking.
 - Emergency power generators (Only operated at MEPCO power failure.

Mitigation Measures

- The scheduled maintenance of power generators will be carried out to achieve exhaust emissions well within PEQS limits.
- Waste Incineration will be carried out at Contractor off-site facility thereby preventing air quality deterioration from exhaust pollutants of incinerators.
- Preventive and proactive maintenance of HVAC system will be carried out to operate the system in accordance with Manufacturer`s specifications so that impact is within the low significance range.
- Exhaust emissions from laboratories, sterilization units, and other medical technology areas (MTA) shall be managed through dedicated ventilation systems equipped with suitable filtration and treatment mechanisms to ensure that discharged air complies with applicable environmental and public health standards. (Medical Technology Area

would typically be located near the laboratory, radiology, OT complex, ICU, and other specialized diagnostic and treatment departments.)

- The HVAC system will operate exclusively on electricity; therefore, no direct air emissions are expected from its operation.

Residual Impact

The impact on air quality will be significantly reduced by implementing the mitigation measures.

Monitoring Measures

Ambient air quality at different locations of Hospital will be monitored on quarterly basis. Also exhaust emissions from emergency power generators will be analyzed for CO, SO_x, NO_x and particulate emissions on quarterly basis. Indoor air quality shall be regularly monitored.

6.7.2 Noise

Potential Impacts

During Operational phase, the noise (causing nuisance) may include the sound during operation of backup generators, from HVAC system and vehicles entering the parking and movement of ambulances. There are some other noises in Hospitals including alarms, televisions, rattling trolleys, machinery and medical equipment, noisy doors, staff activities and ringing bells as well as staff, visitors and patient's conversation. The WHO guidelines suggest Hospital noise levels should average 35 dB (A) during the day and 30dB (A) at night with maximum limit of 40dB (A). These noises if not properly controlled can cause impact of moderate significance.

Mitigation Measures

- As Backup generators will operate only during MEPCO power failure therefore the impact on environment will be negligible if generators are well maintained and operated at Manufacturer's specified specifications.
- The scheduled maintenance of HVAC will be carried out to ensure minimum possible sound levels.
- Provide hearing protective devices to employees working at generators.
- The generators and HVAC systems are enclosed in a building to prevent noise pollution in wards and other buildings.
- No horn is allowed within or around the Hospital.

- Set a 'quite time' overnight and advertise this with posters in corridors and wards.
- Identify faulty machinery to fix the noise problem. Fit soft door closures.
- Educate staff and visitors to keep the noise minimum without disturbing patients.

Residual Impact

Impact from noise pollution can be controlled within acceptable limits of PEQS for noise by incorporating above-mentioned mitigation measures.

Monitoring Measures

The management should arrange periodic survey of ambient noise levels in wards and corridors along with noise emissions from Hospital's machinery.

6.7.3 Soil/Groundwater Contamination

Potential Impact

Soil contamination can be caused by:

- Improper waste management such as burial or open burning of infectious waste within Hospital premises or mixing of hazardous waste in municipal waste.
- Improper sewage water disposal at health care facility
- Accidental spillages of chemicals or wastes

Improper waste management can pose high adverse impact of soil/groundwater contamination.

Mitigation Measures

- Policy on Hazardous Material and Waste Management shall be developed and implemented.
- Waste identification and segregation with color coding to eliminate the chance of hazardous waste mixing with municipal waste. However, in case it is accidentally mixed, the mixed waste will be considered as Hazardous waste.
- Incineration of hazardous waste will be in the scope of EPA certified contractor. Appropriate agreements will be signed to ensure environmentally sound treatment and disposal practices.
- Wastewater from pathological labs and nuclear medicine labs will be pretreated before disposal to sewers.

- Chemicals spillage will be contained to avoid its entry to sewage system, The recovered material will be collected in tightly sealed and labelled container, stored at designated area within the premises and disposed of through EPA certified contractor.
- Comply with Punjab HWM Rules 2014.

Residual Impact:

Soil/groundwater contamination can be minimized by proper waste management.

Monitoring Measures

- Monitor the adherence to Punjab HMW Rules 2014. Conduct Environment Audits.
- Periodic monitoring of water quality is proposed in accordance with PEQS for drinking water on quarterly basis.

6.7.4 Health Hazards

Potential Impacts

Health hazards to the hospital staff, patients, visitors and neighboring communities are the major potential impacts of operational phase of the Hospital particularly due to:

- Not using proper PPEs
- Improper sharps management
- Not following Infection Control Protocols
- Not implementing proper procedures for Hospital waste segregation/collection, transportation, storage and final disposal.
- Exposure to Radiation
- Lack of employees' training and accountability; behavioral issues
- Different types of Hospital Wastes (Infectious waste, sharps, pharmaceutical waste, Genotoxic/Cytotoxic, Chemical Waste, Radioactive waste, Waste with heavy metals, pressurized containers and General health care waste)

An appropriate waste management system shall be implemented to comply with Punjab EPA Hospital Waste Management Rules and relevant PEQS.

Mitigation Measures

- Waste management plan will be prepared and implemented in compliance with Punjab HWM Rules 2014.

- (Appropriate Hospital Waste Management includes Segregation/Collection/Transportation/Storage/Treatment/Disposal)
- Comply with following clauses of Punjab EPA's HWM Rules 2014. (Annexure I)
 - Clause 16 "Waste Segregation"
 - Clause 17 "Waste Collection"
 - Clause 18 "Waste Transportation"
 - Clause 19 "Waste Storage"
 - Clause 20 "Waste Disposal"
- Use of PPE
- Hazards of Hospital Waste, will be mitigated in accordance with WB/IFC Guidelines for Health Care Facilities:
- All waste streams will be segregated at source and treated and disposed of in accordance with their respective waste categories.
- The waste segregation, collection and storage will be carried out within Hospital whereas the waste transportation from the Hospital to the off-site facility, its treatment and final disposal will be in the scope of EPA certified Waste Handling Contractor
- The waste shall not be stored in central storage for more than 24 hours. In case Contractor is unable to collect waste due to any reason such as emergency shutdown of incinerator, infectious waste shall be refrigerated at 3°C to 8°C.
- Enforce the Contractor's employ to use appropriate PPEs.
- Packaging for infectious waste shall include an inner, watertight layer plastic with a leak-proof seal with outer packaging of adequate strength for the specific type of waste.
- Containers for sharps packaging should be puncture-proof;
- Transport vehicles will be dedicated for waste only and compartments should be sealed during travel.

Appropriate Wastewater Disposal:

- Wastewater from Laboratories shall be disinfected with hypochlorite solution in Tanks before discharge to sewerage system.
- Waste segregation measures shall be employed to minimize entry of solid waste into the wastewater stream
- Small quantities of mild, liquid pharmaceuticals, excluding antibiotics or cytotoxic drugs, may be discharged to sewer systems with a large water flow.
- It will be ensured that the wastewater will pass through Septic Pond/Wastewater Treatment System (on-site primary, secondary and tertiary treatment in addition to chemical disinfection) before its discharge to public sewer in order to ensure

wastewater effluent's compliance with PEQS for Liquid Hospital Waste and limits of IFC/WHO Guidelines for Health care Facilities.

Infection Control

- Develop Infection Control Manual to minimize health hazards associated with Infectious Waste.
- Comply Sub-clause 12 of Clause 20 of Punjab HWM Rules 2014 that states "All liquid infectious waste shall be discharged to the sewerage system only after being properly treated and disinfected."
- Implement appropriate sharps management as improper handling of infectious sharp is a major cause of infection causing incidents.
- The hospital will ensure that all personnel at risk of occupational exposure receive the necessary vaccinations, including Hepatitis B immunization, to safeguard their health and safety.
- Ensure use of gloves, masks, and gowns
- Adequate hand washing facilities will be provided throughout the hospital to promote proper hygiene practices and reduce the risk of healthcare-associated and community-acquired infections.

Exposure to Radiation

- Comply with:
 - o Regulations on Radiation Protection (PAK/904) of PNRA and international guidelines on radiation protection and safety standards.
 - o Pakistan Nuclear Regulatory Authority (PNRA) Ordinance 2001
 - o National Policy on Safe Management of Radioactive Waste, Decommissioning and Spent Nuclear Fuel in Islamic Republic of Pakistan (RWP-01/2018)
 - o National Safety Policy – (NP-02/2020)
- Radioactive wastewater from radiotherapy department will be pretreated in decay tanks until its background concentration decreases to acceptable level before its safe disposal to sewage.

Residual Impact:

Residual impact can be significantly reduced provided the mitigation measures are fully incorporated.

Monitoring Measures

- WMO shall monitor adherence to Waste Management Plan in cooperation with Waste Management team
- Effluent from Septic Tank/Wastewater Treatment Section shall be monitored for PEQS for liquid Hospital Waste.

6.7.5 Safety Hazards

Potential Impacts

Safety hazards in operational phase of Hospitals are mainly associated with Improper handling of sharps, exposure to gases, autoclaves and other equipment. The safety hazards include risk of cuts, pricks, gas poisoning, burning, and other bodily injuries. Major risks are fires, explosions, safety incidents and accident

Mitigation Measures

- Hospital Safety Management Program will be prepared and implemented at GSH.
- EHS Policy shall be prepared and implemented.
- Use safe operating procedures of using sharps, gases, and equipment.
- Use PPEs such as prick proof gloves for handling sharps and use masks to protect from gases.
- For fire protection, Buildings will be provided with fire hydrants at outside buildings, standpipe and fire hose systems, fire sprinklers, and smoke and heat detectors and have more than 30680 Imperial Gallon fire water storage.
- For Occupational Safety and Health, IFC General EHS Guidelines are recommended to be implemented.
- Emergency response plan shall be prepared and implemented to address any fire, explosion, spillage of chemicals or waste or any safety incident or accident.
- The employees must be trained to handle any kind of safety incident which may occur in their concerned areas.
- Prepare MSDS data base for all the material or chemicals used at Hospital. It should be available all the time for the employees handling these chemicals.

Residual Impact

Strict implementation of the proposed mitigation measures is expected to lower the adverse effects to an acceptable level.

Monitoring Measures

Safety audits will be conducted on regular basis. Safety dash boards shall be created for visualizing safety data and safety performance.

6.7.6 Socio-Economic Impacts

Positive Socio-economic impacts are expected once the Hospital is operational. These include:

- The establishment of the hospital will provide improved and accessible healthcare services, particularly for the people of Tehsil Mian Channu and surrounding areas
- Job opportunities for medical professionals, paramedical and administrative staff and skilled and unskilled maintenance and cafeteria staff.
- Employment opportunities for local community.
- Expansion of business in neighboring community such as hostels, hotels and restaurants and residences.

Overall positive impact on Livelihood and economical activities is predicted by operational phase of the Project.

6.7.7 Tree Planation

Potential Impact

Planting native trees has a positive environmental impact and will help compensate for any disturbances to avifauna caused by construction and operational activities.

Mitigation Measures

- The management is committed to planting native trees and developing landscapes in the open areas within the GSH premises.
- Serious efforts will be made to ensure the proper growth and maintenance of the planted trees.

Residual Impact

Positive

Monitoring

Monitoring by Admin Officer for growth and maintenance of the planted trees.

6.7 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

Besides the concrete measures to be adopted as described above, the quality of the environment will further be enhanced through the running of the project in complete accordance with the 5RS Principles- Reduce, Reuse, Recycle, Refurbish and Retrofit. Good housekeeping practices will be the order of the day. The proposed project will be installed with all precautionary measures to enhance and save the environment. Following necessary measures will be adopted during construction and operation:

The sprinkling of water will be done on dusty roads and tracks. PPEs will be provided during construction and operation activities. Management Plans for solid and liquid waste along with firefighting and evacuation plans will be prepared and implemented. Machinery will be kept maintained and never be left unattended. Safety signs and boards will be placed at potential risk areas. Adequate ventilation systems will be installed at each floor to keep the ambient conditions complied with PEQS. The area will be restored at the earliest possible by developing landscapes of open areas and concrete paving of parking and washing areas. A proper tree plantation plan will be formulated to save the environment. Solid waste will be handed over to contractors and an agreement will be made. Noise will be controlled by adopting proper measures. Hygienic conditions will be ensured and proper quality will be maintained by quality control testing. Fire extinguishers will be placed at sensitive locations of each floor. First aid facilities will be made available at each floor. Every possible measure will be adopted to make the project safe and environment-friendly. Water conservation is the major potential area having improvement opportunities.

- Proper ventilation systems will be installed to maintain adequate indoor air quality within the Hospital main building.
- Three chamber septic tank and ETP will be installed.
- Water sprays during construction phase will be ensured for dust suppression.
- Energy efficient machines will be installed in order to reduce GHG emissions.
- The projects of rainwater harvesting and solar power system installation will be initiated. Hospital Waste Management Rules 2014 will be strictly followed and an agreement will be signed with EPA certified Laboratory for environmental monitoring and with EPA approved contractor for hazardous waste disposal.

7. ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

This chapter outlines a comprehensive approach to managing and monitoring environmental issues while detailing the institutional framework and reporting mechanisms for implementing the Environmental Management Plan (EMP) during the pre-construction, construction, and operational phases of the proposed project.

The EMP has been developed with the following objectives:

- Detail the project's impacts along with proposed mitigation measures and an associated implementation schedule.
- Establish the roles and responsibilities of the project proponent, contractor, and supervisory consultants to ensure effective communication of environmental issues among all stakeholders.
- Develop a monitoring framework, including reporting frequency, auditing processes, and identification of monitoring parameters, to ensure complete and effective implementation of all mitigation measures.
- Specify the requirements for documenting EMP compliance and effectively communicating it to the relevant regulatory authorities.
- Provide an estimated cost for implementing the key actions outlined in the EMP.

7.1 MANAGEMENT APPROACH

The organizational roles and responsibilities of the Proponent and Contractor are outlined as follows:

Proponent:

The project proponent will hold overall responsibility for ensuring compliance with the EMP during construction and operational phases. Relevant Departments will carry out verification checks to confirm that the contractors are effectively accomplishing their environmental and social responsibilities during construction phase or during life time of the project when contractor workforce is hired. During the operational phase, the proponent, with support from designated staff of the HSE and Admin Departments, is responsible for overseeing the implementation of the EMP and the mitigation measures recommended in the EIA report.

Contractors:

The contractors will implement the majority of environmental and social mitigation measures within their field activities as part of the project. The contractors are subject to certain liabilities under the national laws and specific clauses outlined in their contract with the proponent. The responsibilities detailed in the EMP should be explicitly in the contractor's scope of work during the agreement. The EIA report and the Conditions of Environmental Approvals will be provided to the Contractor.

7.2 ENVIRONMENT MANAGEMENT TEAM, ROLES AND RESPONSIBILITIES

The project proponent of GSH is committed to implementing the Environmental Management Plan (EMP) and holds the primary responsibility for ensuring compliance with EMP. The proponent has designated GM Admin and Manager Projects to oversee overall activities involved in implementation of EMP during Construction Phase. For Operational phase, Medical Superintendent will be responsible in absence of Proponent.

The main personnel involved in the EMP Implementation are

- Proponent
- Medical Superintendent (MS)
- Projects Manager
- Manager HSE/HSE Engineer
- GM Admin/ Admin Manager.

7.2.1 Construction Phase

As the EMP is included in the contract between GSH and the contractors, it becomes the contractor's responsibility to ensure its implementation during the construction phase.

The Contractor's Site Manager will oversee all construction activities, manage the construction crew and site personnel, and ensure environmentally responsible practices. The Site Manager will coordinate with GSH's Manager HSE and Project Engineer. The Manager HSE will be assisted by General Manager and Admin Manager to look after the environment and social aspects. For environmental monitoring, the Manager HSE will collaborate with an EPA-certified laboratory. In addition, Manager HSE will also coordinate with the EPA Punjab to ensure compliance of provisions of environmental approval of the project. Additionally, GSH will establish an Inspection Team to conduct daily inspections and weekly/monthly audits of construction activities, with a particular focus on those related to the EMP.

The Site Engineer of the Contractor will:

- Prepare compliance reports as per schedule and will submit to GSH Manager HSE
- Ensure the use of PPEs by the workers and train them on proper use;
- Conduct the environmental and health and safety trainings to the workers / labor.
- Provide fire extinguishers and first aid boxes at sensitive location and arrange the training of on-contract staff.

7.2.2 Operational Phase

Throughout the Project operational phase, Medical Superintendent (MS) will oversee the timely implementation of EMP and Monitoring Plan. Manager HSE is responsible to manage timely environmental monitoring including Noise level and ambient air monitoring and lab analyses of Effluent, gaseous emissions and groundwater on quarterly basis. HSE Team and Admin Manager will assist MS in implementing EMP and provide support in implementation of Sustainability Projects

7.3 ENVIRONMENTAL MANAGEMENT PLAN (EMP).

Table 7.1 presents the Environmental Management Plan (EMP), providing an overview of the proposed mitigation measures to address potential environmental impacts associated with the location, design, construction, and operational phases of the proposed project. The table also identifies the responsible parties for the implementation and monitoring of each mitigation measure outlined in the EMP.

7.4 ENVIRONMENTAL MONITORING PLAN

Environmental monitoring is a vital component of the Environmental Management Plan. The feedback provided by the environmental monitoring is instrumental in identifying any problem or lapse in the system under implementation and planning the corrective actions.

Main objectives are:

- To provide a mechanism to determine whether the Construction contractors are carrying out the project in conformity with the EMP.
- To document the actual project impacts on physical, biological, and socioeconomic receptors, quantitatively where possible, in order to evaluate adequacy of EMP and determine the need for any improvement.
- To ensure that all the negative impacts generated during Construction and Operational activities have been mitigated to an acceptable level to meet EPA Rules and Regulations and are compliant with Punjab PEQS.

Table 7.2 presents the Environmental Monitoring Plan for Construction and Operational Phases.

Following record should be maintained:

- Periodic inspection reports of the site
- Audit reports of Environment, Energy, Safety and Health
- Record of all moderate and major spills and other incidents; investigation reports.
- Waste tracking registers keeping records of waste generation and disposal.
- Analyses reports of effluent, groundwater, Ambient air, particulates emissions and sound level survey reports
- Record of Utilities and Utilities Bills

- Tree plantation
- Employment opportunities offered to local community
- Community complaints and corrective measures taken
- Approvals from other Govt. departments
- Trainings



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Table 7.1 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

	Potential Impacts	Proposed Mitigation Actions	Institutional Responsibility		Monitoring/ Actions
			Mitigation	Supervision	
A	PROJECT LOCATION				
A.1	- Land acquisition - Resettlement/displacement - o Environmentally sensitive or protected area - Conflict with stakeholders - Road accessibility - Natural Hazards - Compatibility to surroundings - Availability of Utilities -	- Land is legally owned by the proponent - No resettlement or displacement is required - There is no sensitive or protected area around the project site. - No conflict exists with the stakeholders. - Easily accessible to National Highway N5 and Motorway. Convenient Road accessibility to all cities of Pakistan. - Site is not prone to any natural hazard – flood, landslide or any other hazard - Wapda supply is available, Groundwater is of appropriate quality. - Skilled/unskilled workforce is conveniently available. -	GSH Admin Manager	GM Admin	Monitor and resolve any conflict with stakeholders that may arise throughout the project's lifespan

B	DESIGN				
B.1	- Physical trauma associated with failure of building structure - Energy Conservation - Appropriate waste disposal system - Sustainability considerations such as water conservation, use of renewable or low/No carbon fuels - Safety and health hazards – including firefighting system, emergency exits, - Selection of Technology and equipment - Proper Site layout	- All project structures are designed in accordance with engineering and design criteria mandated by site-specific risks, including but not limited to seismic activity, site seismic zones, soil bearing capacity, wind loading and other dynamic loads. - It has been ensured that the designer adheres to International Engineering Standards. - Environmental and energy conservation related considerations are also incorporated. - Water conservation will be ensured by incorporating water-management, water recirculation option. - Fire-hydrant, fire alarms, water sprinklers all have been taken into account at design phase - Provision of Emergency evacuation exits should be properly designed. - At the design stage, it is important to choose environmentally friendly technology along with equipment of minimal carbon footprints and low noise operation - Appropriate site layouts should be developed to support employees for safe and efficient operations and maintenance. - The buildings should be designed and constructed in accordance with environmentally sustainable and eco-friendly practices.	Designing Firm	Proponent	The plant project team will monitor the timely submission and review of design documents.

C	CONSTRUCTION PHASE				
C.1	Soil Erosion and Soil Contamination				
	The likely impacts of earthworks may include: - Soil erosion, Physical scarring of the landscape. - Increased risk of land slippage. - Increased sediment load in surface run off. Spillage of fuel and oil from construction machinery, transportation and storage may cause: - Soil contamination with subsequent groundwater contamination	- Good engineering practices help control soil erosion. - Water must be sprayed on soft soil and excavation work areas to avoid dust emissions and further erosion during construction and installation activities. - Any spillage of fuel and oil from construction machinery, transportation activities, or storage areas shall be promptly contained, collected, and properly disposed of in accordance with environmental management procedures. - Restoration will be done as soon as feasible. - To restore the natural Landscapes, native trees will be planted and green lawns will be developed on open space. - The site's environment and natural beauty are of great interest to the management, who will take action to protect them. - Groundwater will be analysed on quarterly basis to check for any contamination.	Contractor's Site Manager	Project Engineer/ HSE Engineer	Daily inspection of Construction site to check any fuel/oil leakage on the soil or leakage from vehicles or machinery or in storage area.

C.2	Noise				
	- Long-term exposure to Environmental noise may cause premature deaths, contribute to ischemic heart disease, chronic high annoyance and chronic high sleep disturbance - Source of Noise during Construction phase is construction machinery and construction activities. -	- Proper PPEs such as ear plugs and ear muffs will be provided to each employee. - Sign boards will be placed in areas with loud noise levels. - Address Noise hazards in accordance with "OSHA Standards for Construction". - An acoustic enclosure will be fitted if machine is stationary. - Silencers and acoustic canopies shall be installed on standby generators to minimize noise emissions. - It will be ensured to switch off all equipment when not in use. - Keep the music volume of radio or mobile phone down - Only low-noise, well-maintained machinery will be permitted on the construction site.	Contractor's Site Engineer	HSE Engineer	Safety audits will be conducted to verify the compliance of PPEs. Monitoring of noise level on quarterly basis.
C.3	Air Emissions				
	Air deterioration and Health hazard due to: - <u>Dust emissions</u> generated from civil works. - Dust emissions due to vehicles on un-metalled roads.	- Dampening of material and unsurfaced roads. Use water sprays and commence landscaping as early as practicable. - Haul trucks carrying earth, sand, aggregate, and other materials should be kept covered during transportation of materials with tarpaulin. - Dust emission from soil piles and aggregate storage stockpiles will be reduced by covering	Contractor's Site Manager	HSE Engineer	Quarterly monitoring of ambient air for PEQS parameters and submit the

	- Dust emissions due to construction material unloading at site and improper storage - Exhaust emissions of CO, NO_x, SO₂ UHC and particulates from diesel generators, construction machinery/vehicles - Other construction activities which can pose occupational health hazards are welding, metal cutting and painting fumes. -	the piles, for example with tarpaulin or thick plastic sheet. - Restricting dust generating activities during extremely dry or windy days. - Construction materials that are susceptible to dust formation will be transported only in securely covered trucks to prevent dust emission during transportation. Restrict vehicles speed. - Provision of dust respirators to equipment operators and other permanent and contract employees who are exposed to dust. - Use of vehicles, machinery and generators with high combustion efficiency. Scheduled maintenance will be carried out to meet specifications of the Manufacturer as to minimize the emissions. Do not leave machinery, vehicle or equipment running when not in use. - (Before and during the building works, all excavations must be fenced or otherwise guarded against being a danger to the life or property.) - Welders, painters and their co-workers should understand the hazards of material they are working with. (Prolonged exposure of fumes			verified reports to EPA
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		may cause serious health complications.) They should be enforced to wear PPEs. Develop SOPs for welding including relevant guidelines of OSHA. - Electricity will be supplied to Construction site from Wapda. This will avoid the gaseous emissions and noise nuisance from Diesel Generators - .			
C.4	Water Supply				
	- In-sufficient water supply can cause inadequate sanitation and health hazards - Poor Water Quality is also a health hazard - Wastage of water	- Sufficient Groundwater supply will be available - Prepare water conservation plan (e.g., reduce, reuse and recycle) to reduce water use and wastewater generation. - Prevent groundwater contamination from poor management of sewage, solid waste, oil spillage/leakages, vehicles' washing etc. - Sufficient drinking water supply of appropriate quality will be provided to the workers. - Groundwater/drinking water will be analyzed on quarterly basis	Contractor's Site Engineer/HSE Engineer	HSE Manager	Arrange lab analysis of water by EPA certified lab for compliance with PEQS of drinking water.

C.5	Wastewater				
	Inappropriate wastewater management can cause: - Soil and water contamination - Health Hazard	- Sewage from Construction site will be passed through a 3-Chamber Septic Tank before discharge.	Contractor's Site Manager	HSE Engineer	Quarterly analysis of treated Effluent
C.6	Solid Waste				
	- Solid waste during Construction Phase if inadequately managed, can cause health hazard and contamination of soil and groundwater -	- - Solid waste will be segregated at the source - Concrete, Steel, Wood, Plastic, Soil, Masonry and hazardous waste that will be reused or disposed of accordingly, - Concrete waste can be crushed and reused as road base/sub-base, backfilling material, drainage layers, aggregate replacement etc., - Hazardous waste will not be mixed with non-hazardous waste. - Wastage of any useable material will be strictly controlled. - Domestic waste will be disposed of through local MC arrangement. - Packaging waste and saleable construction waste will be sold. - Hazardous waste will be disposed of through an EPA approved contractor. - Ensure proper housekeeping. - Open solid waste burning is prohibited.	Contractor's Site Manager/ Contractor's Environment Engineer	Lead HSE&Q /In-charge Utilities	Daily Inspection of Construction site to ensure proper housekeeping and the use of separate bins for different type of waste

C.7	Occupational Health and Safety				
	Occupational safety and health hazards include: - Over exertion - Slips and Falls - Struck by objects - Moving Machinery - Work on height - Confined Spaces and Excavations - Exposure to dust, chemicals, flammable material and wastes in a combination of liquid, solid, or gaseous forms - Installation of Plant Equipment and Machinery	- Enforce the use of PPEs - Ensure the use of SOPs for work on height and in confined space. - Manage proper housekeeping to avoid safety incidents. - Provision of appropriate warning sign boards at near work site. - Spray water to suppress the dust as required. - Limit vehicles' speed at 20 Km/hr. within the GSH's premises. - Ensure proper maintenance of construction machinery and vehicles to minimize exhaust emissions and leakages of fuel and oil - Ensure appropriate solid and liquid waste handling and disposal. - Load testing of the cranes will be carried out before installation of Plant equipment and machinery. - Fire extinguishers will be placed at Construction site especially where welding jobs are executed - Fire prevention and evacuation plans for Construction Phase should be implemented. - Ensure first aid boxes are available at the construction site and first aid training will be provided to the contractor's staff	Contractor's Site Engineer	HSE Manager	Safety audits
D	SOCIOECONOMIC IMPACTS				

D.1	Traffic				
	Traffic congestion increases the environmental pollution, noise, stress and exhaustion and decrease the time availability for people to spend with their families - Safety Hazard	- The existing roads will easily handle the increase in traffic associated with this development, - . - Plant equipment and machinery will not be transported at peak working hours to avoid traffic congestion and road accidents. - Vehicle speed will be limited to 20 Km/hr. - Gate security guard will ensure the safe exit and entry of a vehicle to and from the road.	Contractor's Site Manager/	HSE Engineer/Admin Officer	The traffic control plan will be monitored regularly.
D.2	Livelihood Of Local Communities And Economic Growth				
	Overall, positive impact is anticipated by - Creating stable Employment opportunities - Economic growth - Skill improvement of locals. - Providing the chances of business expansion	- Local community shall be given priority for employment provided they qualify the job criteria. - Child labor is not allowed	Admin Officer	Admin Manager	Maintain auditable record
E	Biological Environment				

E.1	Trees Removal – No trees need to be removed from the Project site Positive impact of trees plantation	- Landscapes will be developed and tree plantation will be carried out during and after restoration.	Admin Officer	Manger Admin	Trees growth will be monitored on regular basis.
	OPERATION				
	Air Emissions				
	Poor air quality due to the release of contaminants into the work place can cause possible respiratory irritation, discomfort, or illness to workers.	- Normal supply will be from Wapda preventing the project from gaseous emissions. - Carry out proactive maintenance of the standby generators to ensure compliance of emissions with PEQS. - As waste incineration will be carried out at Contractor off-site facility thereby preventing air quality deterioration from exhaust pollutants of incinerators - Ensure installation of proper localized and generalized ventilation systems in order to maintain clean indoor air quality. - Exhaust emissions from laboratories, sterilization units, and other medical technology areas (MTA) shall be managed through dedicated ventilation systems equipped with suitable filtration and treatment mechanisms to ensure that discharged air complies with applicable environmental and public health standards	HSE Engineer	Manager HSE	Gaseous emissions will be monitored on quarterly basis Indoor air quality will be monitored on regular basis.

		- The HVAC system will operate exclusively on electricity; therefore, no direct air emissions are expected from its operation. - Ensure the use of PPEs			
		Noise			
	Employee exposure to noisy machinery, or equipment may induce hearing loss, hearing impairment, hypertension, elevated blood pressure levels and/or other health hazards (OSHA)	- This shall be addressed by using noise barriers or noise canceling acoustic devices. - Machines with low sound level having low sound will be installed - Silencers and canopies will be installed on standby generators - Use of ear plugs and ear muffs by the employees will be ensured in working areas of high Noise level. - Warning Sign Boards will be placed at high sound level areas. - In case of hearing loss of any employee, check the amount of hearing ability lost, exposure level, length of employment, any follow-up measurement taken. OSHA recommends baseline measurement of hearing ability of employees. Develop and implement a monitoring program	HSE Engineer	HSE Manager	Noise level survey will be conducted on regular basis.

		- Instruments used to measure employee noise exposure shall be calibrated to ensure accuracy - The generators and HVAC systems shall be enclosed in a building to prevent noise pollution in wards and other buildings. - Set a 'quite time' overnight and advertise this with posters in corridors and wards. - Identify faulty machinery to fix the noise problem. Fit soft door closures. - Educate staff and visitors to keep the noise minimum without disturbing patients.			
	Water Supply				
	Insufficient and poor quality of water supply can cause sanitation issues and health hazard	An adequate supply of water of suitable quality shall be ensured for all operational and domestic requirements. Workers shall be provided with RO-treated drinking water in compliance with the relevant PEQS.	HSE Engineer	Manager HSE	Groundwater will be analyzed by EPA certified Lab on quarterly basis.

		Proper management and disposal of solid and liquid waste shall be implemented to prevent contamination of soil and groundwater resources.			
	Hospital Waste Management				
	Improper solid waste management may cause a negative impact on environment, safety and health Health and Safety Hazards as a result of inappropriate waste management	- A Hospital Waste Management Team will be constituted as per guidelines of Clause 4 of Punjab HWM Rules 2014. - Hospital Waste management (HWM) Plan shall be prepared as per guidelines of the following clauses of Punjab HWM Rules 2014. (Annexure-I) - Clause 15 "HWM Plan Preparation" - Clause 16 "Waste Segregation" - Clause 17 "Waste Collection" - Clause 18 "Waste Transportation" - Clause 19 "Waste Storage" - Clause 20 "Waste Disposal" - Develop and Implement following Policies - o Hazardous Material and Waste Management - o Waste Disposal	HSE Engineer /Admin Officer	Manager HSE	Auditable record will be maintained.

		- Segregate waste at the point of generation. - Risk waste must not be mixed with Non-risk waste. - All waste categories shall be labelled, color coded and collected in specified bins in line with HWM Rules 2014 and WHO/IFC Guidelines - Follow World Bank/IFC guidelines for treatment and disposal methods for following categories of Hospital waste: • Infectious wastes • Sharps • Pharmaceutical waste • Genotoxic/cytotoxic waste • Chemical waste • Radioactive waste • Waste with high content of heavy metals • Pressure containers • General Health care waste - A clear guide for waste segregation and storage shall be visibly posted in areas where waste is generated. - Packaging for infectious waste shall include an inner, watertight layer plastic with a leak-proof			
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		seal with outer packaging of adequate strength for the specific type of waste. - Containers for sharps packaging should be puncture-proof. - Transport vehicles will be dedicated for waste only and compartments should be sealed during travel. - Determine potential of best waste management practices and encourage: - o Reduce, Safe Reuse, Recycle (3R) - o Environmentally preferable purchasing (EPP) that refers to the purchase of the least damaging products and services, in terms of environmental impact. - o Green procurement such as procurement of recyclable plastics in place of PVC based or use of less hazardous chemicals. - Interim storage shall be away from patients and public access. - Hazardous and non-hazardous waste shall always be transported separately in three categories to avoid mixing: - o General Waste - o Infectious Waste			
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		○ Other hazardous waste (such as chemicals and pharmaceutical) - Document waste generation on daily and monthly basis - Immunization for staff members is necessary for Hepatitis B virus. - All the staff working in areas where infectious waste is handled should be trained on safe waste management procedures and infectious control. - EPA certified Waste Handling Contractor shall be hired who has permission to handle, transport, treat and dispose of the Hospital Hazardous Waste at approved Treatment sites. - All waste will be protected from theft, vandalism or scavenging by persons or animals.			
		Wastewater			
	Improper Wastewater management can contaminate soil and groundwater and cause	- Ensure Segregation, waste minimization, and safe storage for liquid wastes as for solid wastes.	HSE Engineer	Manager HSE	Lab analysis of treated effluent will be

	health hazard and adverse impacts on the surrounding ecological environment.	- Strictly limit the discharge of hazardous liquids to sewers - The effluent will be treated at Septic Tank/ETP in order to comply with relevant PEQS. The ETP will involve primary, secondary, and tertiary treatments along with disinfection before its disposal or reuse. - Reduce to an absolute minimum the presence of antibiotics and pharmaceutical residues in wastewater; cytotoxic waste should not be discharged to wastewater stream. - Wastewater from Biochemistry Lab, Histology and Hematology Labs shall be disinfected, neutralized and pretreated before disposal to Sewers after compliance with PEQs for liquid stream generated from the Hospitals - Dewatered sludge will be disposed of through EPA certified contractor. - Recycle as much water as possible. - Spillages or leakages of chemicals shall be properly contained to prevent their discharge into or mixing with wastewater streams. -			carried out on Quarterly basis and reports will be submitted To EPA
	Traffic				
	Additional traffic load is anticipated on adjacent roads	- The existing access roads and surrounding transportation network are expected to efficiently manage the increased traffic load	Admin Officer	Admin Manager	Traffic Plan will be regularly monitored

		associated with hospital operations, including patient arrivals, visitor traffic, staff commuting, and ambulance movements.			
	Occupational Safety and Health				
	Occupational illness and injuries are mainly associated with improper handling of sharps, infectious waste, exposure to chemicals, drugs and radiation; gas poisoning; spills on the floor, ergonomic related musculoskeletal disorders (MSDs), workplace violence, fire and explosion	- Process safety management (PSM) system will be implemented - Following plans will be prepared for each floor and implemented: - Emergency preparedness procedure including evacuation plan - Firefighting plan - Safety plan for Chemicals handling in accordance with Chemicals MSDSs. - Fire-extinguishers will be placed at different locations - HSE Policy shall be prepared and implemented. - Ensure proper hazardous waste management in line with Hospital Waste Management Rule to avoid occupational injuries and illness. - Work permit system for maintenance will be implemented at GSH	Production Manager/Maintenance Manager/ HSE Manager	MS/Manager HSE	Safety audits will be carried out.

		- SOPs will be prepared for all operation and maintenance activities. - Employees will be provided with PPEs including gloves, safety shoes, helmets, safety goggles, face masks, ear plugs/muffs - Sign boards will be placed at risk and high noise areas - Assembly points will be notified and rehearsals/drills will be arranged - Proper lighting will be provided - Safety hazards will be communicated with adequate signage, - Spills of chemicals/oils/fuels will be quickly handled and contained in accordance with the guidelines of relevant MSDS. - Ventilation systems will be properly installed in enclosures and on each floor level to prevent the accumulation of vapors or gases. - - The staff will be trained on emergency handling, firefighting and first aid. - Inspection schedule will be prepared to check fire-extinguishers and first aid boxes on bi-monthly basis. - First aid boxes shall be provided at designated locations throughout the facility, and workers			
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		shall receive appropriate training in first aid and emergency response procedures. - SOPs for Dengue control will be implemented - Ensure awareness to permanent and contract employees for potential safety and health hazards associated chemicals, drugs, gases, radiation, hospital waste and wastewater and other material used at Hospital.			
	Livelihood of Community and Economic Growth				
	Positive Socio-economic impacts are expected once the Hospital is operational	- The establishment of the hospital will enhance the availability, accessibility, and quality of healthcare services, particularly for the residents of Tehsil Mian Channu and surrounding areas. - The project will generate employment opportunities for medical professionals, paramedical personnel, administrative staff, and skilled and unskilled workers involved in maintenance, housekeeping, security, and cafeteria services. - Preference will be given to unskilled and qualified local residents during recruitment, thereby promoting local employment and economic development. - The hospital is expected to enhance economic growth in the surrounding area by increasing demand for supporting businesses and services,	Manager HR	MS	Auditable record will be prepared

		including hostels, hotels, restaurants, shops and residential accommodations.			
	Gender Equality				
	Positive Impact however, potential gender-related issues may arise if equal access, employment opportunities, or workplace safety are not adequately addressed.	- The project will promote gender equality by providing equal employment opportunities and ensuring non-discriminatory recruitment, training, and career advancement practices for all genders. - The hospital will provide a safe, inclusive, and respectful working environment supported by appropriate workplace policies and grievance mechanisms. - Equal access to healthcare services will be ensured for all patients regardless of gender, thereby contributing to improved health outcomes and social inclusion. - Adequate facilities, including separate sanitation and changing areas, will be provided to meet the needs of male and female staff and patients. - The project will contribute to women's empowerment by creating employment opportunities and improving access to quality healthcare services for women and girls in Tehsil Mian Channu and surrounding areas.	Manager HR	MS	
	Tree Plantation				

Positive impact of tree Plantation	- Tree Plantation Plan will be prepared and implemented - Extensive plantation of native trees will be carried out and landscapes will be developed on open areas.	Admin Officer	Manager Admin	Growth of planted trees will be monitored on regular basis.
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Table 7.2 Environment Monitoring Plan for Construction and Operational Phases

Components	Parameters	Standard	Frequency		Responsibility	Performed By
			Construction	Operations		Submitted to EPA
Noise	Noise Level dB(A) Survey	PEQS For Noise	Quarterly	Quarterly	HSE Engineer	To be Performed by EPA Certified Lab and reports will be submitted to EPA Field Office on quarterly basis
Ambient Quality	Air CO, SO ₂ , NO _x , Particulates (PM ₁₀ , PM _{2.5})	PEQS For Ambient Air	Quarterly	Quarterly	HSE Engineer	
Gaseous Emissions	CO, SO ₂ , NO _x , Particulates	EPA PEQS for Industrial Gaseous Emissions	Quarterly	Quarterly	HSE Engineer	

Water Quality	Drinking water PEQs,	PEQS/WHO for Drinking water	Quarterly	Quarterly	HSE Engineer	
Effluent	All parameters PEQS	PEQS for Industrial Effluents	Quarterly	Quarterly	HSE Engineer	
Trees Plantation	Visual Inspection	Environmental Sustainability	Regular Monitoring by Site Administration		Manager Admin	



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7.5 SCHEDULE FOR IMPLEMENTATION AND ENVIRONMENTAL BUDGET

7.5.1 Schedule for Implementation

- Construction phase is planned to start just after obtaining Environmental Approval for from EPA Punjab
- The Planned duration for is 1.5 year.

7.5.2 Environment Budget

GSH is committed to creating and promoting an environmentally sustainable and responsible culture and foster continuous improvement in its performance in terms of its environmental footprint. The budget proposed for effectively implement the EMP is summarized in Table 7.3.

Table 7.3 Environment Budget for EMP Implementation

Activity	Description	Cost (PKR)
Environment Monitoring Cost	Analyses of Noise, ambient air, Effluent and Water Quality	600,000
Solid Waste Disposal	Solid Waste management	600,000
Wastewater Treatment	O&M	900,000
HSE	PPEs, firefighting arrangement etc. (Cost of staff payments not included)	1,200,000
Plantation Plan	Tree Plantation	300,000
Training Program	Trainings	600,000
	Grand Total	4,200,000

7.6 PROPOSED EMP REPORTING AND REVIEWING PROCEDURE

The EMP will be incorporated into the contract between project contractor/s and GSH. It will be a contractor's responsibility to implement the EMP during Construction Phase. However, GSH HSE and Admin Departments will provide support to the Contractor's team whenever required to work for a common cause.

- The contractor's Site Manager will prepare periodic progress report of EMP implementation and share with HSE Engineer. After review by HSE Engineer and Admin Officer, the report will be submitted to Manager HSE.
- Manager HSE will review the report and assess the compliance with EMP and discuss the report in internal departmental meetings headed by the Proponent.
- At the completion of project construction, the Contractor will prepare the project completion report and submit to the Proponent.



- In case of non-compliance by the contractor, the Proponent will take proper action on non-compliance in accordance with a clause of contract and may recommend to make deductions from the payments to the contractor.
- Change of management plan will be implemented to incorporate any change required in the EMP during design and construction stage.
- During Operational phase, the Proponent will oversee the implementation of EMP with the support of Production, HSE and Admin Departments. The periodic progress report will be presented by Manager HSE and Admin Manager in the MR Meetings. The compliance status of the conditions of Environmental Approval will be closely monitored by Manager HSE and reported in Monthly Meetings. The compliance status will also be shared in BOD Meetings by the Proponent.

7.7 ENVIRONMENT TRAININGS

GSH will provides periodic Environmental and HSE trainings to their permanent and Contract Employees. A comprehensive annual training calendar will be developed. Environment, Health and Safety (EHS) are considered to have a high weightage in their performance evaluation process.

7.8 GRIEVANCE REDRESS MECHANISM (GRM) SUMMARY

Key features of the GRM include:

1. **Social Complaint Register (SCR):** The contractor will maintain an SCR at project sites to document all complaints from Project Affected Persons (PAPs) and local communities.
2. **Complaint Resolution Process:**
 - Upon receiving a complaint, the contractor will record it in the SCR and attempt to resolve it within 15 days in coordination with Manager HSE and Admin Manager.
 - If the issue remains unresolved, it will escalate to the MS, who will address it within another 15 days.
 - Further unresolved issues will be taken to the Proponent if they are of serious nature, with a resolution timeframe of one month.
 - If the complainant is still dissatisfied, they have the right to pursue legal action.
3. **Documentation and Communication:** Proposed remedial actions will be documented in the SCR, along with implementation responsibilities and schedules. Complainants will be informed of the proposed and actual actions taken, and their feedback will also be recorded.
4. **Review Process:** The SCR will be reviewed in fortnightly site meetings to monitor the progress of remedial actions.

Overall, the GRM aims to provide a structured approach for addressing grievances, ensuring community concerns are managed effectively throughout the project lifecycle.



8. CONCLUSION AND RECOMMENDATIONS

8.1 CONCLUSION

The Environmental Impact Assessment (EIA) has been conducted for the proposed project titled, “Establishment of Gul Sahib Hospital, Tulamba, Tehsil Mian Channu, District Khanewal.” The findings of the EIA study indicate that the proposed project is environmentally, socially, and legally feasible, subject to the implementation of the proposed mitigation and management measures. The project proponent is committed to undertaking all project activities in an environmentally responsible manner and to minimizing potential adverse environmental and social impacts through effective implementation of the Environmental Management Plan (EMP).

Furthermore, the proposed project is of significant public importance and is anticipated to contribute to the welfare of the local community by providing improved healthcare services and generating direct and indirect employment opportunities

8.2 RECOMMENDATION

Based on the environmental screening, impact assessment, and findings of the present study, no additional detailed investigations are deemed necessary at this stage. The anticipated environmental and socio-economic impacts of the proposed project are expected to be manageable through the implementation of proposed mitigation measures

It is therefore recommended that the Punjab Environmental Protection Agency (Punjab-EPA) kindly grant Environmental Approval for the proposed project, subject to the effective implementation of the Environmental Management Plan (EMP), Environmental Monitoring Plan, and compliance with all relevant statutory and regulatory requirements.

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ANNEXURES



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ANNEXURE I: GLOSSARY

Term	Definition
Aesthetic Value	The value derived from the beauty, visual appeal, and experiential qualities of a landscape or place.
Ambient air quality	Ambient air quality refers to the quality of outdoor air in our surrounding environment.
Archaeology	The study of human history and prehistory through the excavation of sites and the analysis of artefacts and other physical remains.
Biodiversity	The variety of plant and animal life in the world or in a particular habitat, a high level of which is usually considered to be important and desirable.
Climate.	The weather conditions prevailing in an area in general or over a long period
Conservation	Official supervision of rivers, forests, and other natural resources in order to preserve and protect them through prudent management
Construction Waste	Waste generated from the buildings and construction industry and includes material like bricks, concrete, tiles, debris, ceramics and more.
Consultant	A person who provides professional advice or services to companies for fee
Cultural Heritage	Valued objects and qualities such as historic buildings and cultural traditions that have passed from previous generations.
Demographic	A single vital or social statistic of a human population, as the number of births or deaths
Ecology	The branch of biology that deals with relations of organisms to one another and to their physical surroundings
Effluent	Liquid wastes such as sewage and liquid waste from industries
Environment	Relationship of natural world (human beings, animals and plants) with physical surroundings (air, land, water).
environmental impact assessment (EIA)	(EIA) is an analytical process that systematically examines the possible environmental consequences of the implementation of projects, programs and policies
environmental management plan	(EMP) is a site-specific plan developed to ensure that all necessary measures are identified and implemented in order to protect the environment and comply with environmental legislation.
Excavation	The act or process of digging, especially when something specifics being removed from the ground.
Fauna	The animals of a particular region, habitat, or geological period.
Flora	The plants of a particular region, habitat, or geological period.
Framework	A real or conceptual structure intended to serve as a support or guide for the building of something that expands the structure into something useful
Hazardous Waste	Waste that poses substantial or potential threats to public health or environment



Impact	The action of one object coming forcibly into contact with another.
IEE	Initial Environmental Examination
Livelihood	A set of activities involving securing the basic necessities –food, water, shelter and clothing of life.
Peak ground acceleration	Peak ground acceleration (PGA) is equal to the maximum ground acceleration that occurred during earthquake shaking at a location
Policy	A policy is a deliberate system of principles to guide decision and achieve rational outcomes
Proponent	A person who advocates a theory, proposal, or course of action.
Rehabilitation	To restore to a condition of good health, ability to work, or the like
Resettlement	The settlement of people in a different place
Resource	A stock or supply of money, materials, staff, and other assets that can be drawn on by a person or organization in order to function effectively.
Sanitation	Conditions relating to public health, especially the provision of clean drinking water and adequate sewage disposal
Seismic Hazard.	A seismic hazard is the probability that an earthquake will occur in a given geographic area, within a given window of time, and with ground motion intensity exceeding a given threshold.
Seismology	The branch of science concerned with earthquakes and related phenomena.
Stakeholder	A stakeholder is a party that has an interest in a company, and can either affect or be affected by the business. The primary stakeholders in a typical corporation are its investors, employees and customers.
Topography	Topography is the study of the shape and features of the surface of the Earth and other observable astronomical objects including planets, moons, and asteroids
Vegetation	Plants considered collectively, especially those found in a particular area or habitat.

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ANNEXURE II: ABBREVIATIONS & ACRONYMS

CO	Carbon Monoxide
CCHA	Community Controlled Hunting Area – CCHA
CSR	Corporate Social Responsibility
dB(A)	Decibel- A
ERP	Emergency Response Plan
EHS	Environmental Health & Safety
EMMP	Environmental Management and Monitoring Plan
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
HSE	Health Safety & Environment
GRM	Grievance Redress Mechanism
IEE	Initial Environmental Examination
IFC	International Finance Corporation
ILO	International Labor Organization
LAA	Land Acquisition Act
LST	Land Surface Temperature
LULC	Land Use and Land Cover
MSDS	Material Safety Data Sheets
NCSW	National Commission on the Status of Women
NFPA	National Fire Protection Association
NOC	No Objection Certificate
OSHA	Occupational Safety & Health Administration
NOx	Oxides of Nitrogen
SOx	Oxides of Sulfur
PM	Particulate Matter (2.5 or 10)
PGA	Peak Ground Acceleration
PPE	Personal Protective Equipment
PEPA	Punjab Environmental Protection Act
PEPC	Punjab Environmental Protection Council
PEQS	Punjab Environmental Quality Standards
3R	Reduce, Reuse & Recycle
SEAL	Solution Environmental & Analytical Laboratory
SF	Square Foot
SOPs	Standard Operating Procedures
WHO	World Health Organization

ANNEXURE III:

**LIST OF INDIVIDUALS AND ORGANIZATIONS
CONSULTED ALONG WITH THEIR FEEDBACK**



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Consultation with Stakeholders

Name	Designation	Organization	Concerns/Advice
Dr. Muhammed Aslam Nasir	Proponent	Gul Sahib Hospital, Tulamba, Mian Channu	- The establishment of GSH will enhance access to quality healthcare services in Tehsil Mian Channu and surrounding areas, thereby contributing to the social well-being of the local community. - Compliance with the provisions of the Punjab Hospital Waste Management Rules, 2014, will be ensured throughout the project lifecycle. - GSH will establish a dedicated Health, Safety, and Environment (HSE) Department responsible for developing HSE plans and implementing the Environmental Management Plan (EMP) prior to the commencement of construction activities. - GSH is committed to promoting environmental sustainability through the implementation of energy-efficient practices, water conservation measures, and tree plantation initiatives..





Mr. Ahsen Manzur	Managing Partner	M/s Design Matrix	- The proposed buildings are being designed as per FGI-2018 (Guidelines for design and construction of Hospitals) in addition to other International and National standards and Codes. -
Mrs. Maham Ayesha	Environmentalist	Lahore	- She expressed concerns regarding occupational health and safety risks associated with the handling of infectious materials and hazardous chemicals. She recommended the provision of appropriate personal protective equipment (PPE), regular staff training, and periodic occupational health surveillance to safeguard workers' health and safety..
Hafiz Nasir Anwer Khan	Director	Powerlink Engineering, Lahore	- He highlighted his concern over medical waste disposal and stressed the need to prevent theft, or scavenging, recycling or unauthorized reuse of hazardous waste by individuals. - He was informed that the hazardous waste shall be disposed of through an EPA approved contractor and incinerated at contractor's off-site facility.



Dr. Naveed Ramzan	Dean Engineering	UET, Lahore	- Use of natural light in building design should be ensured which in addition to energy conservation, may improve the patients' recovery process and reduce the length of stay (LOS) in hospital. - GSH should prepare and implement a Safety Plan of all chemicals based on their MSDS
Mr. Adeel Ahmad	Production Manager	Fatimafert Ltd, Lahore	- Develop green belts around the hospital premises to reduce dust and improve the surrounding air environment. - Ensure outdoor pollution sources are located away from fresh-air intake points. - Maintain appropriate indoor air quality through the installation of an efficient HVAC system, -
Mr. Talha	Environmentalist	Lahore	- He raised concern over risk of soil, surface water, and groundwater contamination from wastewater and hazardous waste if not properly managed. - He suggested to install and maintain an efficient wastewater treatment system and regularly monitor effluent quality before discharge.



			- He was informed that GSH will install an Effluent Treatment Plant (ETP) comprising pre-treatment, primary, secondary, and tertiary treatment processes, along with a disinfection system, to effectively address this concern.
Syed Nihal Asghar	Director,	M/s Seal Lahore	- Establish a comprehensive environmental monitoring program and publicly disclose key environmental performance indicators. - Adopt water conservation measures, rainwater harvesting, and water-efficient fixtures.
Mr. Ijaz Ahmad	Sr. Manager HSE (Ex)	FFC, Karachi	- He pointed out the significance of Emergency preparedness for chemical spills, fire incidents, and infectious disease outbreaks. He suggested to develop and regularly update emergency response and contingency plans; conduct staff training and mock drills. -
General Public			-





ANNEXURE IV: REFERENCES

- [1] IFC (2012), “IFC Performance Standards on Environmental and Social Sustainability”
 - [2] World Bank Group/IFC (2007), “Environmental, Health, and Safety (EHS) Guidelines - General EHS Guidelines”
 - [3] World Bank Group/IFC (2007), “Environmental, Health, And Safety Guidelines - Health Care Facilities”
 - [4] World Health Organization (2014), “Safe management of wastes from health-care activities” edited by Y. Chartier et al. – 2nd Edition.
 - [5] NESPAK (2007), “Building Code of Pakistan” Ministry of Housing and Works, Govt. of Pakistan
 - [6] EIA Checklist
 - [7] Punjab Hospital Waste Management Rules 2014
- <https://www.weather-atlas.com/en/pakistan/mian-channu-climate>



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ANNEXURE V: TERMS OF REFERENCE (TOR)

PURPOSE: Terms of Reference (TOR) For Appointment of Consulting Firm for Conducting Environmental Impact Assessment (EIA) For The Project “Establishment Of Gul Sahib Hospital, Tulamba Tehsil Mian Channu, District Khanewal”

The Consultant will conduct the EIA and prepare a report in accordance with guidelines of EIA set by EPA Punjab and the Punjab Environmental Protection (Review of IEE/EIA) Regulations 2022.

The Consultant will:

- Review published literature and all relevant data/drawings provided by the Proponent, as well as collect additional pertinent information.
- Examine all applicable legislation, standards, and policies.
- Conduct a Baseline Environmental Study, including environmental monitoring of the project site by a field team from an EPA-certified laboratory.
- Engage in public consultations and hold meetings with stakeholders.
- Identify all potential positive and negative impacts of the proposed project during the pre-construction, construction, and operational phases.
- Recommend mitigation measures to eliminate or reduce negative impacts to acceptable levels.
- Prepare an Environmental Management Plan (EMP) and a Monitoring Plan.
- Finalize the EIA report in collaboration with the Plant management.
- Assist the proponent (until obtaining the NOC) with:
 - Submission of the report to the Punjab EPA for review.
 - Addressing all queries raised by the EPA following their review of the report.
 - Public Hearing

The **Consultant EIA Team** will consist of environmentalists, ecologist, sociologist (as a minimum requirement), all possessing relevant academic qualifications and experience. The team leader must have over 15 years of diversified experience and have conducted at least 10 large size industrial-level IEE and EIA studies.

Duration: Preparation of draft EIA report within 6 weeks for review of Proponent and submission of final report to EPA within 8 weeks for review of EPA, Punjab.



ANNEXURE VI: EIA TEAM

Team Members

Name	Position	Qualification
Dr. Sajid Hassan	Team Leader	PhD Combustion Engineering, Imperial College, London Diploma In "Combustion and Environment Pollution" Imperial College London BSc Chemical Engineering, UET, Lahore
Mr. Arshad Ali	Chief Chemist	BSc Chemistry (Hon) University of Punjab, Lahore
Mr. Muhammad Tayyab Muzzammil	Environmentalist	BSc Environment Sciences,
Sheikh Obaid ur Rehman	Sr. Ecologist	MSc Forestry
Mr. Naveed Sajjad Khan	Sociologist	MA Sociology, University of the Punjab



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ANNEXURE VII:

LAND DOCUMENTS

(TO BE SUBMITTED SEPARATELY

WITH APPLICATION)



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ANNEXURE VIII: APPROVAL FROM DISTRICT COUNCIL FOR LAND CONVERSION AND LAYOUT APPROVALS APPLICATION SUBMISSION PROOF

DISTRICT COUNCIL KHANEWAL

Form A - IX
See Rule (17)
Challan For remittance of money to The Bank of Punjab Kwl (0738)

District Council
BOP Ghalla Mandi
KWL (0738) A/C #
5310031187300011

Date: 23 / 06 / 2022 No. 115

By whom brought	On what Account	Amount	
		Rs.	Ps.
ارباب حسین دہانہ خٹک	کشتل میں بیت ل	1712000-	
تمہارے بھائی محمد علی خٹک	سہا 21-24		
محمد حسین (بیت ل) جبکہ 14 بیٹل میں حقیقہ	نور شریف	1532512-	
17/12/2021	لغنتہ میں		
21-8-21	کشتل میں		
17/12/2021	Total	3244512-	

Total in words: تین کروڑ چار لاکھ پچاس ہزار روپے

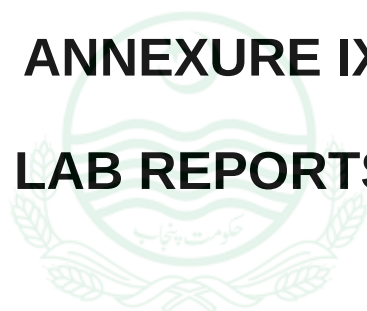
Cash received
Examined and entered
Treasury Officer/Treasury
Accountant/Post Master.

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ANNEXURE IX

LAB REPORTS



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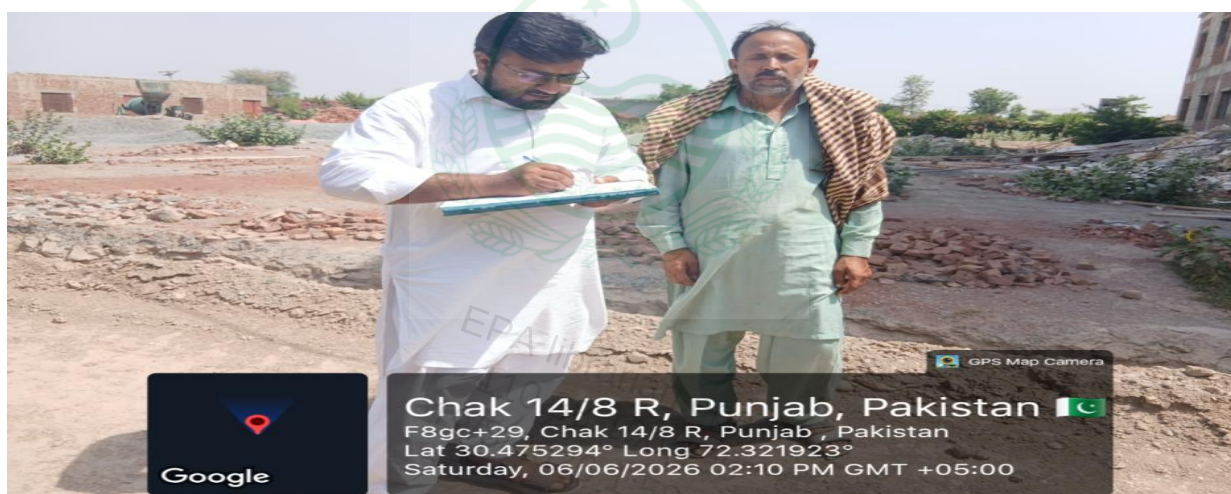
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