



**ENVIRONMENTAL IMPACT ASSESSMENT REPORT
M/S PAK-ARAB REFINERY COMPANY LIMITED (PARCO)
QASBA GUJRAT, MAHMOODKOT, KOT ADDU, DISTRICT
MUZAFFARGARH**



**ENVIRONMENTAL IMPACT ASSESSMENT REPORT
M/S PAK-ARAB REFINERY LIMITED (PARCO)
QASBA GUJRAT, MAHMOODKOT, KOT ADDU,
MUZAFFARGARH**

Report Prepared By:

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Pak-Arab Refinery Company Limited
(PARCO)

Proponent:

Mr. Amar Abbas

Address:

Qasba Gujrat, Mahmoodkot, District
Muzaffargarh



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List of Annexure

Annex A: TORs

Annex B: Government Approvals

Annex C: Layout Map of Project

Annex D: Copy of CNIC & Relevant Documents

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Annex F: Socioeconomic Questionnaires'

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Annex H: Flow Diagram of HSD Storage Tank

Annex I: Google Earth Map

Annex J: Plantation Details

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Annex L: HSE Staff Detail

Annex M: PARCO initiatives





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EXECUTIVE SUMMARY

INTRODUCTION:

It is intention of Proponent Name: Mr. Amar Abbas General Manager Refinery, PARCO M/s Pak-Arab Refinery Company Limited (PARCO), having CNIC: 32303-0341189-9 to get environmental approval for the installation of the New HSD Tank (945-TK55) under the name of M/s Pak-Arab Refinery Company Limited (PARCO) Situated at Qasba Gujrat, Mahmood Kot, Kot Addu, District Muzaffargarh by submitting the Environmental impact assessment (EIA) report.

The subject project will deal with the Construction, Testing, Integration & Commissioning of New HSD Tank (945-TK55) with total storage capacity of 25000m³ to cater the increasing production & storage demand, along with serving as alternative storage tank in case of maintenance of any of the existing tanks. The total estimated cost of the proposed said HSD Tank will be Rs. 816 million (Approx.).

Project proponent has secured the NOCs from the **OIL & GAS REGULATION AUTHORITY** (OGRA) Government of Pakistan on the basis of (Companies Ordinance, 1984) for existing storage tanks. **(all Govt. approvals are attached in Annexure-B).**

Location

Project site is located at Qasba Gujrat, Mahmood Kot, Kot Addu, District Muzaffargarh

North: Road

South: Road

East: Plant Boundary Wall

West): Road

Location of the proposed please assess the Google Map as shown below





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For further details, please consult the layout plan of the project site. (Annexure-C)

Project Proponent

Proponent Name: Mr. Amar Abbas General Manager Refinery, M/s Pak-Arab Refinery Company Limited (PARCO), has appointed as proponent for filing application and other relative procedures to get environmental approvals.

CNIC No. 32303-0341189-9

Address: Mid Country Refinery, Qasba Gujrat, Mahmood Kot, Kot Addu, Distt., Muzaffargarh.
Details are attached in **Annexure-D**

Environmental Consultant

Pak Green Enviro-Engineering (Pvt.) Ltd, as independent consultants, has been appointed by the proponent to conduct Environmental impact assessment Report.

Company office address:

Lahore office: Pak Green Laboratory (EPA Certified), 46 M, Gulberg III, Lahore.

Islamabad office: Suite No. 14 Shaukat Plaza, I-10 Markaz Islamabad.

Tel: +92-04235441444 +92-3004462976

Email: info@pakgreen.pk

For detail company profile see the *Chapter # 1 “Introduction”*

Brief outline of the proposal

The proposed project is the Construction, Testing, Integration & Commissioning of New HSD Tank (945-TK55) with total storage capacity of 25000m³ to cater the increasing production & storage demand, along with serving as alternative storage tank in case of maintenance of any of the existing tanks under the name of M/s Pak-Arab Refinery Limited (PARCO) Situated at Qasba Gujrat, Mahmood Kot, Kot Addu, District Muzaffargarh. Total Area of the Project is 18396-meter squares. The project will deal with the construction of New HSD Tank (945-TK55). The storage capacity of the tank will be 25000m³. The estimated initial cost of the project will be Rs 816 million (Approx.).





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The construction and installation of the subject project will be started only after obtaining the NOCs from all concerned Govt, as per procedure, and local authorities including NOC of EPA Punjab.

Construction & design of proposed works for the New HSD Tank (945-TK55) shall be in accordance with API-650 and company will comply with these guidelines and criteria and also safety standards.

The project will also have safety system comprising of firefighting network like fire water distribution system, firefighting equipment's, fire pumps and personal protective equipment's etc. and will be responsible to ensure availability/maintenance of the safety equipment/system and implementation of schedule-II Under Rule 9 & 10 of Civil Defense (Special Powers) Rule 1951.

Legal requirement:

The construction of proposed works for the New HSD Tank (945-TK55) shall be strictly in accordance with the API-650, the terms and conditions of this provisional license and instructions of the Oil and gas Regulatory Authority.

The subject project falls in the category of the project requiring Environmental Impact Assessment (EIA), of Schedule-II of PEPA Regulation 2022.

Major Impacts

In order to identify all the activities associated with the proposed project of New HSD Tank (945-TK55) during construction and operation phase with potential to cause adverse environmental impacts and harm a thorough review has been conducted. Project will not have significant adverse impacts on the nearby community and on environment. Overall, the project will have positive impacts on the local population and country as a whole. Moreover, area for plantation is also reserved for air purification within the project vicinity.





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Summary of Major Environmental Impacts

Pollutant	Constructional phase	Operational phase
Health and safety issues	Health and safety issues can be arisen due to machinery handling and constructional activities.	Health and safety issues will be arose by release of HSD, machinery handling and improper practice of work during storage, handling and transportation of HSD
Gaseous emissions	Flue gases will be generated due to site generators and vehicles transportation	Nil
Odor	Odor will not be generated during the construction phase.	Odor can be generated due to leakage of tank
Particulate matter (PM)/dust	Particulate matter will be generated during the constructional and transportation activities at the site Due to raw materials loading/unloading	NIL- HSD will be transported through existing infrastructure of the refinery. Area will be paved.
Solid Waste	Solid waste will be generated due to construction	Solid waste will be generated due to repair & maintenance works.



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Soil Contamination	Soil can be contaminated due to leaching of oil, fuel, any stored oil.	Soil can be contaminated due to leaching of stored HSD oil caused by accidental HSD spillage.
Waste water	Waste water will be generated from constructional and domestic sources	Waste water will be generated from domestic sources.
Noise	Noise will be generated due to construction machinery and vehicles transporting materials	Noise will be generated due to Operational Pumps for HSD transfer.
Impacts on flora and fauna	Removal of some vegetation due to land clearing	There will not any kind of impacts in the operational phase.
Socioeconomic	Positive impact due to generation of Employment opportunity	Positive impact due to generation of Employment opportunity



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Recommendation for Mitigation measures

Pollutants	Recommendations during construction phase	Recommendations during Operation phase
Health and safety issues	HSE Trainings of persons/labors involved in the construction and planning of the project is recommended PPEs should be provided to workers during constructional activities.	Training of workers should be conducted regarding health safety & Environment. Use of PPEs should be implemented at workplace. First aid measures/medical facility should be provided to project related employees. Safety signs should be placed inside the premises. Adequate firefighting system & Equipment should be installed Safety signs should be placed at all sensitive areas etc. Tank and equipment's should be marked and tagged properly Keep the tank valves closed when not in use and fit and tighten the plug to the tank valve internal thread. Inspect the tank on a regular basis to ensure it is in good condition, free from rust and housed properly. Store the tank in a secure location to protect against falling,



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		damage, being hit by ride on mowers, vandalism, etc. The HSD tank should be in good condition, and must be free from damage and rust. The HSD tank valve should be clean and in good condition. Proper housekeeping should be ensured.
Particulate matter (PM)/dust	Sprinkling of water is recommended during the construction All constructional raw material should be kept covered	All the places within the unit should be paved to avoid any dust emissions during loading/unloading and transportation of tanks. Monitoring should be conducted as per EPA PEQS Rules 2001.
VOCs	No VOCs will be generated during the construction phase of the project.	HSD is the contents of this tank. Storage tank will be designed as per API-650 which ensure that major parameters vapor pressure, molecular weight of the product, tank characteristics, diurnal temperature, paint factor, tank capacity, and number of turnovers are designed in such way which ensures least VOC contents emissions.
Soil Contamination	Placed plastic sheets under leaching material to avoid leaching or the leaching material should be placed inside trays or drum bunds.	Provide plastic sheets under tank dyke area leaching material to avoid leaching of leaked or spilled HSD oil. Dyke capacity should be as per OGRA rules to contain volume of the tank.



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		Provide secondary containment for all temporary stored fuel or chemical during the operational phase to avoid leaching inside the soil.
Noise	Vehicles to carry raw materials should be tuned properly and trainings for safe driving practices/HSE are recommended for driver's/machinery operators. Ear plugs/muffs should be provided in case of heavy noise	Ear plugs/muffs should be provided to workers in case of high noise during working hours Trainings for safe driving practices & HSE trainings of the employees and workers is recommended. Within the unit, horns should be prohibited during working hours and it is recommended that speed limit of should be 15 km/hr. permissible. Monitoring should be conducted on quarterly basis as per EPA PEQS.
Waste water	Waste water treatment system/septic tank should be installed to treat the water at PEQS prior to discharge into local drain Waste water from construction and domestic sources should be treated in septic tank	waste water treatment system i.e. connection with existing ETP plant is recommended Wastewater from domestic sources should be treated at existing effluent treatment plant of the refinery. Wastewater from the unit should not be discharged into any water



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	before drained out.	body or drain without treatment. Monitoring should be conducted on monthly basis as per EPA PEQS.
Odor	The odor will not be produced during constriction	Regular maintenance of tank and valve is recommended
Impacts on flora and fauna	Land is almost clear, only few vegetation-like shrubs, weeds, grasses are present No protected or sensitive species is present at site	Plantation should be done within and outside of the boundary wall
Socioeconomic	Local people should be preferred for the employment	Community wellbeing should be considered and anticipated measures are recommended to preserve the local culture and ecosystem Neighbor's privacy should be on priority. Local people should be preferred for the employment



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Proposed Environmental Monitoring

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. Monitoring for Environmental Parameters is recommended:

Particulate Matter/Dust

Regular monitoring for particulate matter should be conducted during construction and operation phase as per PEQS and report should be submitted to EPA Punjab.

Flue Gases

Regular monitoring for vehicular emissions should be conducted during construction and operation phase as per PEQS and report should be submitted to EPA Punjab.

Noise

Regular monitoring for noise level should be recorded periodically during construction phase of the project and it should be conducted on quarterly basis and report should be submitted to EPA Punjab.

Water quality

Regular monitoring for waste water should be conducted during construction and operation and report should be submitted to EPA Punjab. Record should be maintained regarding the underground water pump and consumption.

Recommendation: Environmental Monitoring data log book should be maintained by the project proponent

Screening

The project falls under Schedule II, category A clause 5 for EIA, of PEPA, Regulations, 2022. TORs of the study under clause 5 (f) of policy and procedure for the filing, review and approval of environmental assessment are annexed as **Annexure-A**.





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CHAPTER # 1

INTRODUCTION

This section of the report provides an overview of the rational of the project, objective of the project, why it was to be installed, purpose of the report an approach adapted to conduct the Environmental impact assessment (EIA) for the construction of new HSD Tank.

1.1. Purpose of the report

Environmental impact assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore in compliance with the legal requirement for Pakistan Environment Protection Act-1997 (PEPA-1997), Section 12- for obtaining No Objection Certificate (NOC) before starting and construction activity at the project site. The other relevant regulations and guidelines considered while preparing this EIA report include:

- Policy and procedures for filing, review and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation.
- Guidelines for sensitive and critical areas.
- Detailed sectorial guidelines
- OGRA rules for storage of petroleum products
- Guidelines of NFPA-30 of HSD Rules.
- Design of tank as per API-650

Various aspects like environmental, social, physical and other aspects of the project both during construction and its regular occupancy are highlighted in this EIA report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to





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help decision makers, EPA Punjab in the present case, before issuing the desired Environmental Approval.

1.2. Scope of study

The scope of study includes baseline survey of the proposed project, collect relevant data from primary and secondary sources, assess the impacts related to the subject project, suggest the mitigation measures to control the anticipated impacts, formulate the environmental monitoring program to check the environmental parameters at PEQS, prepare an Environmental Management plan to implement the recommended mitigation measures, consultation with the stakeholder or nearby community to know their concerns regarding the subject project.

1.3. Identification of the Project:

According to the PEPA Regulation 2022, “the project is fall in the Schedule II, category A clause 5 for EIA of PEPA Regulation 2022.

1.4. Project Title:

The subject project to which Environmental impact assessment (EIA) required is entitled as ‘Proposed Construction, Testing, Integration & Commissioning of New HSD Tank (945-TK55) with total storage capacity of 25000m³ to cater the increasing production & storage demand, along with serving as alternative storage tank in case of maintenance of any of the existing tanks under the name of M/s Pak-Arab Refinery Company Limited (PARCO) Situated at Qasba Gujrat, Mahmood Kot, Kot Addu District Muzaffargarh.

1.5. Project Benefits

The Project will be developed in response to a number of driving forces, including;

- Economic development.
- Poverty reduction.
- Project will help to meet the excessive demand of HSD Tank.
- Replacement of wood burning which leads to adverse impacts in the environment.





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- Contribution in the development of infrastructure.
- Compliance to sustainable development goals.
- Contribute into national GDP.
- Will enhance strategic oil storage capacity of the country.
- Project will comply on the HSD crises in that region.
- Project will create jobs for the indigenous/local persons.
- To provide better opportunities for the nearby vicinity including skilled and unskilled workers.

1.6. Project Proponent

Mr. Amar Abbas is the General Manager Refinery, PARCO of M/s Pak-Arab Refinery Company Limited (PARCO) CNIC No. 32303-0341189-9 Mid Country Refinery housing society, Qasba Gujrat, Mahmood Kot, Distt., Muzaffargarh. Project proponent has applied for the subject project in the office of D.G EPA Punjab for environmental approval, CNIC and other relevant documents are attached in **Annexure- D**

1.7. Details of Consultant

Pak Green Enviro-Engineering (Pvt.) Ltd is an independent company, who conducts EIA, EIA, EMP and other environmental investigations through its panel of environmental consultants, public participation practitioners and experienced environmental managers. The company has its own recommended instruments to check the baseline environmental data/PEQS and lab analysis facility for water, waste water priority parameters.

Contact: Pak Green Enviro-Engineering (Pvt.) Ltd.

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The current study was carried out by the following professionals:

Sr. No.	Designation	Name/Qualification	Experience
1	Chief Environmentalist/ Director/ Ecologist/LEP*	Abdul Hafeez Nasir PhD Scholar (Environment)	12 years' experience as Environmentalist
2	Senior Environmentalist Deputy Director Lab/AEP**	Iftikhar Ahmad M.Phil. Environmental Science	5 years' of experience as environmentalist
3	Chief Analyst/SMS***	Muhammad Raza Ullah M.Sc. Analytical Chemistry	20 years of experience as chemist analyst
4	Senior Environmentalist General Manager	Umair Rasheed M.Phil. Environmental Science	5 years' of experience as environmentalist
5	Environmentalist	Muhammad Hassan Afzal M.Phil. Environmental Sciences	4-year experience as Environmentalist
6	Environmentalist/ coordinator	Sabeera Tauheed M.Phil. Environmental Sciences	2-year experience as Environmentalist
7	Environmentalist/ AEP	Nageen Qayum BSC, Environmental Engineering	1-year experience as Environmentalist
8	Environmental Engineer/ AEP	Muhammad Imran	1-year experience as Environmentalist
9	Lab Analyst/SMS****	Quratulain M.Sc. Analytical Chemistry	5 years' of experience as environmentalist

*LEP: Lead Environmental Professional

****EP: Environmental Professional

**AEP: Associate Environmental professional

***SMS: Subject Matter Specialist

1.8. Nature, Size and Location of the Proposed Project

The proposed project is the Construction, Testing, Integration & Commissioning of New HSD Tank (945-TK55) with total storage capacity of 25000m³ to cater the increasing production &





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storage demand, along with serving as alternative storage tank in case of maintenance of any of the existing tanks under the name of M/s Pak-Arab Refinery Company Limited (PARCO) Situated at Qasba Gujrat, Mahmood Kot, Kot Addu, District Muzaffargarh. M/s Pak-Arab Refinery Company Limited (PARCO) Situated at Qasba Gujrat, Mahmood Kot, Kot Addu, District Muzaffargarh encompasses Total Area of the Project is 18396-meter squares. The storage capacity of the HSD Tank is 25000m³. The cost for the proposed project is about Rs. 816 million (Approx.).

The total covered and open area specifications of facilities have been designed and are given in the annexed map.

1.9. Location

Project site is located at Qasba Gujrat, Mahmood Kot, Kot Addu District Muzaffargarh.

Land coordinated are given below:

North ----- Road within PARCO industrial Unit

South----- Road within PARCO industrial Unit

East-----PARCO Plant Boundary Wall

West ----- Road within PARCO industrial Unit

For further details, please consult the layout plan of the project site. **(Annexure-C)**





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1.10. Methodology of EIA Report

For the purpose of this report, environmental and social baseline data and conditions at/around the project site has been undertaken. The methodology adopted to conduct the EIA Study includes Review of Layout Plan, detail meetings with the client, orientation session, development of data acquisition plan, Analysis of Data, review of existing data, primary & secondary data collection survey, Screening of Potential Environmental Impacts and Mitigation Measures and also interviews with people near the project area has been conducted to collect their opinion regarding the proposed project and after findings it has been concluded that the project will not have any major adverse impacts on the socio-economic environment of the existing community

1.11. Screening

The project falls under Schedule II, category A clause 5 for EIA, of PEPA, Regulations, 2022. TORs of the study under clause 5 (f) of policy and procedure for the filing, review and approval of environmental assessment are annexed as **Annexure-A**





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CHAPTER # 2

ANALYSIS OF ALTERNATIVES

This Chapter deals with the analytical overview of different alternatives that have been considered. The analysis has been carried out critically so as to justify the need of the Project and to select the most feasible alternative. Besides the economic viability; environmental sustainability and social soundness of the proposed Project has also been considered while analyzing different alternatives.

2.1. THE NO PROJECT ALTERNATIVE

Adopting zero-alternative would mean abandoning all the potential that the site offers to investor(s), contribution to government revenue and even local community livelihoods' improvement.

2.1.1. LOCATION/SITE ALTERNATIVES

To fulfill the commercial aspects of the project under reference of this EIA Report, it is to be sited at a place where commercial processing activity is either already going on or there are bright prospects of the same. Concurrently, it must also meet the legal requirements of the Punjab Environmental Protection Act, 1997 (Amended 2012). Availability of land at the best convenient place is equally important among other considerations for the site selection. Availability of access roads, communication facilities, electricity, basic infrastructure, sewerage etc. is yet the other necessary requirements.

Obviously, environmentally sound, neat and clean environment are the other considerations for site selection. The project will also facilitate the people of the area with increasing the opportunity of employment, and other related facilities.

Keeping these requirements and their feasibility and other basic infrastructural requirements, the selected site is ideally suited for Construction of the subject unit.





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2.1.2. ALTERNATIVE SITE

No Alternative site has been considered due to insignificant environmental impacts. The proposed site fulfills the site selection criteria of Oil and gas Regulatory Authority.

2.2. MODIFIED CONSTRUCTION TECHNOLOGY ALTERNATIVES

As the project site is said project is proposed, there are no construction technology alternatives rather some alteration/renovation of the building will be done.

2.3. TECHNOLOGY ALTERNATIVES

HSD filling in tanks is done in local markets and also in the industries. In locals markets it is done manually and there are high risks of explosion which can cause many casualties. Whereas in HSD filling industries HSD filling process is done by adopting the advance technologies which is operated for the controlling of gas pressure as well as to minimize the leakage of gas. M/s Pak-Arab Refinery Company Limited (PARCO) will adopt an advanced best industrial practice HSD filling procedure with features at par with any international brand HSD filling procedures.

A state-of-the-art system of PARCO controls the operations of the filling. It used digital feedback and control system to adapt to filling requirements. The filling plant will have an industrial grade keypad, display and electronic control box to make safe for its operation in HSD environment. Filling operation does not start until the clamping is properly secured, and a safety signal is given to the control system. The filling plant/dispenser has flame and weatherproof enclosures. The use of high precision differential amplifiers and controlling embedded design makes it a unique product in local industry. The system used a state-of-the-art calibration mechanism. It will auto-calibrate after each fill of a tank thus ensuring the highest possible accuracy.





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CHAPTER 3

DESCRIPTION OF THE PROJECT

3.1. Type and Category of the Project

The proposed project engages the Proposed Construction, Testing, Integration & Commissioning of New HSD Tank (945-TK55) with total storage capacity of 25000m³ to cater the increasing production & storage demand, along with serving as alternative storage tank in case of maintenance of any of the existing tanks under the name of M/s Pak-Arab Refinery Company Limited (PARCO) Situated at Qasba Gujrat, Mahmood Kot, District Muzaffargarh. The project will deal with HSD storage into the tank for the supply to the local community.

According to the PEPA Regulation 2022, the project is considered in the Schedule II, category A clause 5 for EIA of PEPA Regulation.

3.2. Project Objectives

Main objectives of the proposed project are given below:

- To provide quality services.
- To contribute towards improvement of economy in the county.
- To cause minimum visual damages to the local environment.
- To maximize human welfare.





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3.3. Location

Project site is located at Qasba Gujrat, Mahmood Kot, Kot Addu, District Muzaffargarh.

The Location of said project site are as following:

For further details, please consult the layout plan of the project site. (**Annexure-C**).

3.4. Existing Land Use:

The land selected for the construction of proposed HSD Tank is in suburban area of the Qasba Gujrat, which comes under the industrial zone. The proposed land under the ownership of M/s Pak-Arab Refinery Company Limited (PARCO).





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3.5. Road Access:

The project site is accessed with Qasba Gujrat Road.



3.6. Cost and Magnitude of the operation

The current status of the project is proposed project is the Construction, Testing, Integration & Commissioning of New HSD Tank (945-TK55) with total storage capacity of 25000m³ to cater the increasing production & storage demand, along with serving as alternative storage tank in case of maintenance of any of the existing tanks under the name of M/s Pak-Arab Refinery Company Limited (PARCO) Situated at Qasba Gujrat, Kot Addu, Mahmood Kot, District Muzaffargarh. Total Area of the Project is 18369-meter squares. The estimated initial cost of the project will be Rs 816 million (Approx.).





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3.7. Schedule of Implementation

Detailed feasibility studies and designing of the project have been completed. Necessary legal, administrative and financial formalities are in progress. The project is expected to be completed within 19 months from the date of environmental approval. Subsequently the operational and maintenance aspects of the project will be undertaken by the proponent. License form the Explosive Department shall be obtained during construction phase of the project as per procedure.

3.8. Project Description

High Speed Diesel (HSD)

“High speed diesel” means any hydrocarbon oil (excluding mineral colza oil and turpentine substitute), which conforms to such specifications for use as fuel in compression ignition engines.

(Ref: The Petroleum and Natural Gas Regulatory Board Act, 2006, No. 19 of 2006, India, amended as of May 2013.)

High Speed Diesel is used in generators, cement factories (for ignition), vehicles etc. It is an end user product and is used in diesel engines, a type of internal combustion engine.

3.9. Process Description

The proposed project engages the Proposed Construction, Testing, Integration & Commissioning of New HSD Tank (945-TK55) with total storage capacity of 25000m³ to cater the increasing production & storage demand, along with serving as alternative storage tank in case of maintenance of any of the existing tanks under the name of M/s Pak-Arab Refinery Company Limited (PARCO) Situated at Qasba Gujrat, Mahmood Kot, Kot Addu, District Muzaffargarh.

Pak-Arab Refinery Limited (PARCO) is an integrated energy sector organization engaged in diverse businesses with foreign participation. PARCO is a dynamic and progressive organization, operating over 2,000 km cross-country crude / product pipelines network and latest Mid-Country Refinery (MCR). After MCR’s refinery capacity enhancement to 120%, i.e.,





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120,000 BPSD, production of finished products especially HSD has also increased while storage capacity remained same. In order to cater the problem of high inventory of HSD and provide flexibility in maintaining higher refinery thru-put, a new HSD Tank of 25000 m³ capacity is required.

Now, PARCO is planning to construct New HSD tank of size / capacity as mentioned above at location as marked on plot plan (attached) at MCR as per applicable relevant code & standards on EPCC basis. all related equipment and materials for above mentioned HSD Tank, transportation to MCR Site, allied construction / installation (civil, mechanical / piping, electrical, instrumentation & control, etc., activities), integration with existing MCR plant, testing, commissioning, hand-over, Defect Liability provisions under an EPCC Contractor.

Scope of Work broadly includes but not limited to following:

- Engineering works including but not limited to design of tank, cathodic protection system, breather valves, piping, electrical, instrumentation, civil foundations, dike wall, culverts, access road & ramp and fire water system etc.
- List of Equipment including tank plates, roof structure, breather valves, flame arrestors, MOV's / HOV's, Cathodic Protection (CP) System, Electrical & Instrument cables & accessories, material for civil works etc. for construction of New HSD Tank.
- Civil works
- Mechanical works (cutting, welding etc.)
- Piping (AG / UG) works including installation, testing and tie-ins with existing system.
- Electrical & Instrumentation works including, supply and integration with existing system
- Fire Water network including installation, testing and integration with existing system
- Painting
- Inspection





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- Testing & Calibration
- Accessories and spares.
- Commissioning

The construction of the subject project will be started only after obtaining the NOCs from all concerned Govt. authorities including NOC of EPA Punjab.

Construction & design of proposed works for the storage and filling plant shall be in accordance with API-650 & with NFPA-30 and company will comply with these guidelines and criteria and also safety standards.

The project will also have safety system comprising of firefighting network like fire water distribution system, firefighting equipment's, fire pumps and personal protective equipment's etc. and will be responsible to ensure availability/maintenance of the safety equipment/system and implementation of schedule-II Under Rule 9 & 10 of Civil Defense (Special Powers) Rule 1951.

3.10. Silent Feature of the Project

Total Area..... 18396-meter squares.

Purposes of project..... HSD Tank

Total Capacity 25000m³

QTY of HSD Tank 1

Cost of the project..... Rs. 816 million (Approx.).

Labor.....20-25 Persons (Construction), 2-3 person
(Operation)

Power Requirements..... WAPDA and generator

Solid Waste.....Office waste, Domestic Waste

Liquid Waste..... Domestic Waste





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Treatment Plant..... STP which works on RBC (rotational biological contractors) principle.

Water source..... 3 wells

Fire water Pump Capacity..... 1126m³/hr.

Firefighting Equipment..... As per NFPA Codes-10, 14, 20, 24, 25, 58, 72

Parking.....Parking for trucks and cars is present

For further details, please consult the layout plan of the project site. **(Annexure-C)**

Cost Breakup Analysis	
Description	Amount
Engineering, Project Management and Administration Services	150 million
Construction and Commissioning	280 million
Procurement Services, Supply of Equipment & Material	386 million
Total cost	816 million (Approx.)

3.11. Equipment Detail

HSD Tank project will include

- Breather valves,
- MOV's
- PSV's
- LV Switchgear
- Tank Gauging System
- Field Instruments.





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- Fire water line for fire sprinkler
- Instrument Air
- Fire water line for fire monitor etc.
- electrical & instrument cabling, CP system
- earthing, lighting, field instruments etc.

As per initial input from bidders, additional pump is not required for the said project.

3.12. Fire Fighting Equipment detail

- Fire Fighting Pump as per required capacity
- Fire Pump motor
- Jockey pump
- Fire hydrants & monitors for emergency use
- Fire Alarm
- Electric fire pump controller
- Showering system at tank

Fire management system of PARCO, Fire Crew Training Schedule and pictorial evidence of trainings are attached in **Annexure-K**

3.13. Project process

Tank diameter is 48 meter. The HSD Tank has storage temperature of 50°C and for truck loading, existing pumps (945-P21A/B) will be used. Each HSD Tank is connected with rundown line and truck loading line. Explained flow diagram of HSD storage is annexed as **Annexure H**.

M/s Pak-Arab Refinery Company Limited (PARCO) will follow and possibly adopt the operation of HSD Tank to make the project and operation safe and environmentally friendly.

Diesel Oil is a complex mixture of Hydro Carbons. It is a brown colored oily liquid with pungent smell. MPRL domestically mainly markets two grades of HSD namely BS-III & BS-IV. The main difference between BS-III and BS-IV in the Sulphur content, i.e. for BS-III 350 ppm and BS-IV 50 ppm to name a few examples.





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Our supply of Diesel Oil is primarily catered to corporations who sell to gas stations as diesel engines are used in cars, motorcycles, boats and locomotives. Automotive diesel fuel serves to power trains, buses, trucks, and automobiles, to run construction, petroleum drilling and other off-road equipment and to be the prime mover in a wide range of power generation & pumping applications. The diesel engine is high compression, self-ignition engine. Fuel is ignited by the heat of high compression. HSD is normally used as a fuel in medium and high speed compression ignition engines (operating above 750 rpm) in commercial vehicles, stationary diesel engines, locomotives and pumps etc.

3.14. Waste Products of Project Process

3.14.1. Water Requirement

Main sources of water consumption are domestic & project related sources as cleaning, & sprinkling purpose.

About 200 gallons of water will be used during construction phase for sprinkling and domestic purposes while 100 gallons of water will be used during operation phase for domestic purposes. The water requirement will be fulfilled by underground water by unit's own wells.

Note: According to WASA a person consumes 70-80 gallons of water per/day. In the industry a person works for 8 hours. From that it can be concluded that a worker can consume 25-30 gallons per day in the industry.

Calculate the range of water consumption

$$\begin{aligned}\text{Water Consumption (low)} &= \text{worker strength} \times L_{\text{ow}} \\ &= 5 \times 20 \\ &= 120 \text{ gallons/day}\end{aligned}$$

$$\begin{aligned}\text{Water Consumption (high)} &= \text{worker strength} \times \text{High} \\ &= 5 \times 35 \\ &= 175 \text{ gallons/day}\end{aligned}$$





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3.14.2. Waste water treatment:

About 60-70% of the used water will be the waste water, which will be treated in the septic tank which are already installed within the premises of the subject project. Water will not be disposed of without treating in Sanitary Treatment Plant.

3.14.3. Sanitary waste treatment plant (STP):

The design capacity of sanitary waste treatment plant is 7.5 m³/hr. total which is capable of treating an average daily flow rate of 144 m³.

The expected sanitary waste water feed and treated water properties are as follows.

Sanitary effluent feed :	BOD ₅	300 mg/l
	TSS	300 mg/l
Treated sanitary effluent :	BOD ₅	20 mg/l
	TSS	30 mg/l

3.14.4. Process Description:

Two packaged rotating biological contactors receive sanitary waste water from the office, buildings, toilets, and kitchen facilities.

The sanitary effluent treat at the aeration section and flows to the clarifier section.

The treated sanitary effluent flows by gravity into a hypochlorite contact tank.

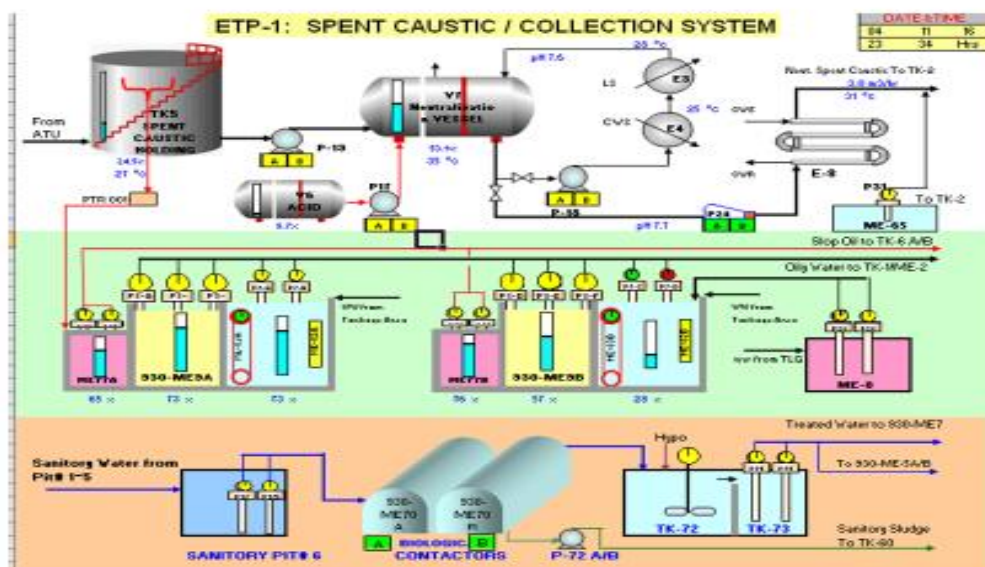
The hypochlorite is dosed in to the contact tank by the injection pumps at start/stop signals of a sanitary waste feed pumps. The disinfected sanitary treated water which is introduced to a sanitary treated effluent tank (is normally transferred to a final lift station sump).

In case of shortage of BOD₅ in the biological aeration basins (930-ME5A/B), the sanitary treated water is led to aeration basin in WTP.





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Design of Sanitary Treatment Plant

3.14.5. Solid waste:

All raw materials will be recycled during the construction activities as road filling and maintenance purposes. Solid waste of about 10-15 kg/day by domestic sources will be generated during Construction phase which will be placed in bins and about 18-20 kg/day solid waste will be generated during functioning of the project from domestic & project related sources. Domestic waste will be placed in solid waste bins which will be placed at appropriate places within subject unit and will be eventually handed over to contractors while project related waste like Defective valves, Defective or leaking pressure-relief device, Damage tank valve, valve protection, and tank foot rings, Out-of-date requalification will be sent for maintenance, will be properly repaired or replaced and sold out to the contractor.

The proponent has appointed dedicated environmental team to manage the solid waste on regular basis, to ensure the good housekeeping at site, to inspect any discrepancies arise due to improper





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functioning of the HSE conditions and to adopt the proper solid waste management system and safety measures.

3.14.6. Sludge:

Sludge from HSD Tank will be replaced on regular basis and will be disposed-off in environmentally friendly way through certified contractor; contractor can use it as composite component or incinerate it.

3.14.7. Parking Area

Parking area will be reserved within the industry for cars, motorcycles, trucks etc.

3.14.8. Fire Protection System

An addressable fire protection system with detection and alarm annunciation and other installations etc. would be provided to protect against any fire hazards. Fire buckets and fire extinguishers will be installed at all sensitive places within proposed project. Firefighting equipment will be maintained by the subject project as mentioned above.

It is a requirement that at least one fire extinguisher be easily accessible at the filling site. Each extinguisher should be at least an 18 lb. dry chemical model with a B:C rating. In workplaces where employees are expected to know how to use fire extinguishers, OSHA requires employees to be trained on fire extinguisher use and operation upon initial hiring and annually thereafter.

It is important to note that fire extinguishers are not intended to put out propane fires and can only cover a limited area when used. They are effective, however, for small fires, such as those involving combustible materials, and can be helpful in creating an escape route for personnel.

A monthly visual inspection of all fire extinguishers is required. This includes checking the extinguisher to be sure it is fully charged and has a tag showing the date of its last annual inspection. If the extinguisher is due for inspection, low on charge, damaged, or missing an inspection tag, stop filling operations and notify your supervisor immediately.

3.14.9. MSDS Provision

A Material Safety Data Sheet (MSDS) is available from HSD suppliers or distributors and must be available and accessible to all employees at the workplace. The MSDS provides important





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information on propane/HSD including physical properties, health effects, first aid, safety precautions, and personal protective equipment (PPE).

3.14.10. Good Housekeeping Practices

Good housekeeping is an important part of safety everywhere. Wet, slippery, and oily floors, and tools left lying around, can cause injury. Poor housekeeping can also hide defects in electrical wiring, piping, and equipment.

Good housekeeping practices at a dispensing location should include:

- Keeping the dispensing area clear except for objects necessary for operations.
- Reporting product and oil leaks immediately.
- Keeping driveways and fire hydrants clear of anything that could limit fire truck access.
- Storing tanks properly.
- Checking fire extinguishers to make sure they are fully charged and accessible.

3.14.11. Emergency Exits:

Emergency exit points will be made available for easy evacuation in case of emergency situations. And exits have been designed in the given map.

3.15. Training Schedule

The proponent has appointed dedicated HSE team to conduct Monthly or quarterly Training of the workers/staff. HSE Manager/EMR/Operation manager will train the labor for the handling and storage of the tanks, HSE conditions, filling procedure. He also trains the labor to cope with firefighting situations and use of the firefighting equipment's.

3.16. Personal protective equipment:

Workers will be provided with Gloves, ear plugs, Masks & other personal protective equipment during the working hours to insure personnel health & safety. Implementation of PPEs will be ensured by the proponent for the proposed project.





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3.17. Power sources and transmission:

Power requirement will be fulfilled from WAPDA.

3.18. Restoration / Rehabilitation Plan

All possible precaution will be taken to prevent an untoward incident in terms of life and property losses. The demolition materials will possibly be reused and recycled. All excavated surfaces will be restored in environment friendly way.

One completion of the project, the debris will be removed from the site in order to maintain aesthetics of the project. All measures will be undertaken for ensuring occupational safety, security and clean environment in the project area. Local species of trees and flowering plants will be planted within the unit premises, along the road sides with the consultation of EPA and Consultants.

3.19. Plantation

Area for plantation will be reserved within the premises of the project and planation has been done within, outside and at the boundary wall of the unit. Tree plantation plan proposed for the subject project is attached as **Annexure-J** with the report.

3.20. Government approvals required by the project:

Project proponent has secured the NOCs from the Concerned **Govt. approvals are attached in Annexure-B).**





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CHAPTER # 4

DESCRIPTION OF ENVIRONMENT

4.1. Physical Environment:

4.1.1. Topography & Geography

The proposed site is situated at Qasba Gujrat Kot Addu, District Muzaffargarh. The district and town of Muzaffargarh are in central Pakistan at the south-western edge of the Punjab. The district lies upon the Thal Doab, an area that lies between the Indus River (to the west) and the Chenab River (to the east), which join some 100 km south of Muzaffargarh town. The area around the project site is a flat, alluvial plain.

4.1.2. Soil

The project area is located in Qasba Gujrat of Mehmood Kot, District Muzaffargarh. Topography of the area is almost flat with no noticeable variation in the surface. There are no mountains or hills in the project area. Indus alluvium constitutes the main soil groups in the area, which have a loamy and clayey texture. The alluvium has been laid down by the Indus River and consists largely of relatively permeable silt loams, loams, and silty, clayey loams.

Lab reports of soil sample of site are attached in Annexure-E

Pictures for sampling of soil are being attached below.





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Fig(a)

4.1.3. Climate

The city of Muzaffargarh is located in southern Punjab province at almost the exact center of Pakistan. The closest major city is Multan. The area around the city is a flat, alluvial plain and is ideal for agriculture, with many citrus and mango farms. There are many canals that cut across the Muzaffargarh District, providing water from nearby farms. This makes the land very fertile. However usually land close to the Chenab are usually flooded in the monsoon season.

Muzaffargarh features an arid climate with very hot summers and mild winters. The city witnesses some of the most extreme weather in the country. The highest recorded temperature is approximately 54 °C (129 °F), and the lowest recorded temperature is approximately –1 °C (30 °F). The average rainfall is roughly 127 millimeters (5.0 in). Dust storms are a common occurrence within the city.





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4.1.4. Temperature & Precipitation

Temperature & precipitation pattern can be estimated from the below figure simulated on simulated weather data have a spatial resolution of approximately 30 km and may not reproduce all local weather effects, such as thunderstorms, local winds, or tornadoes.

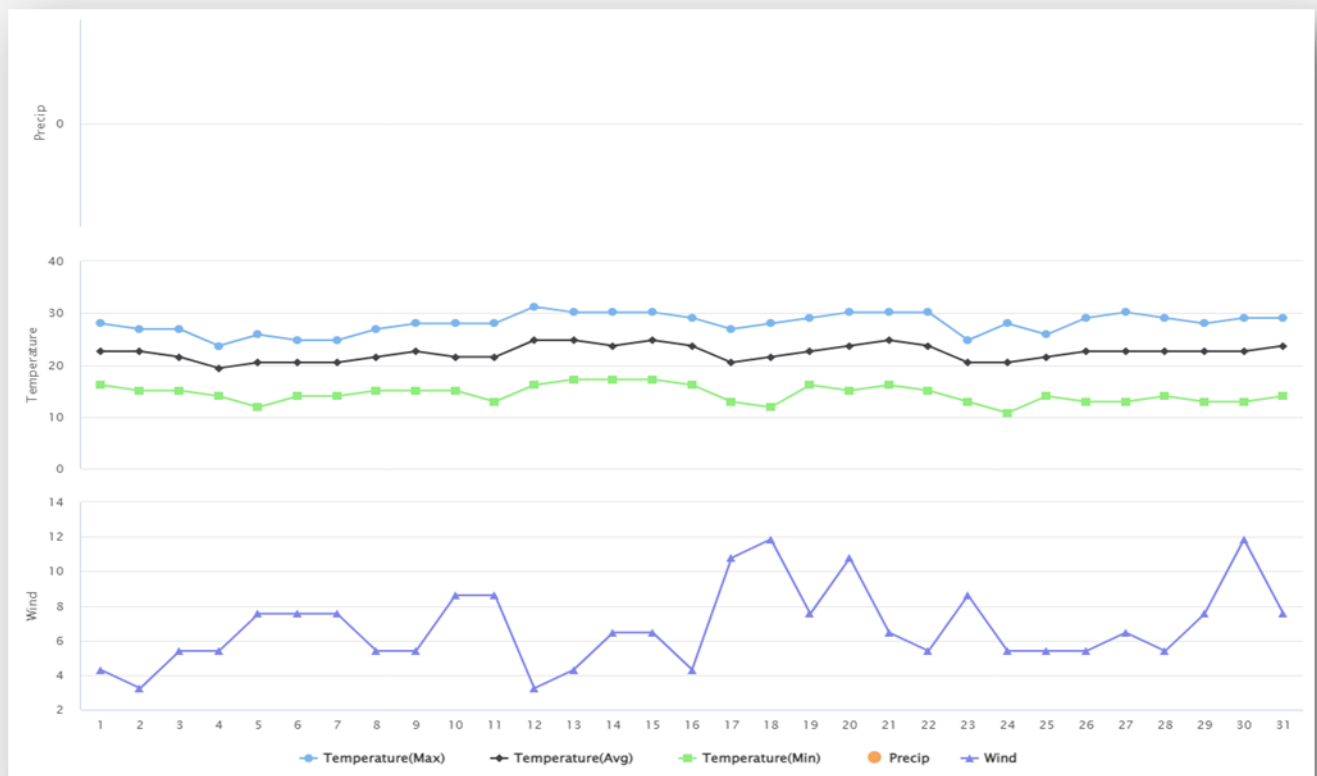
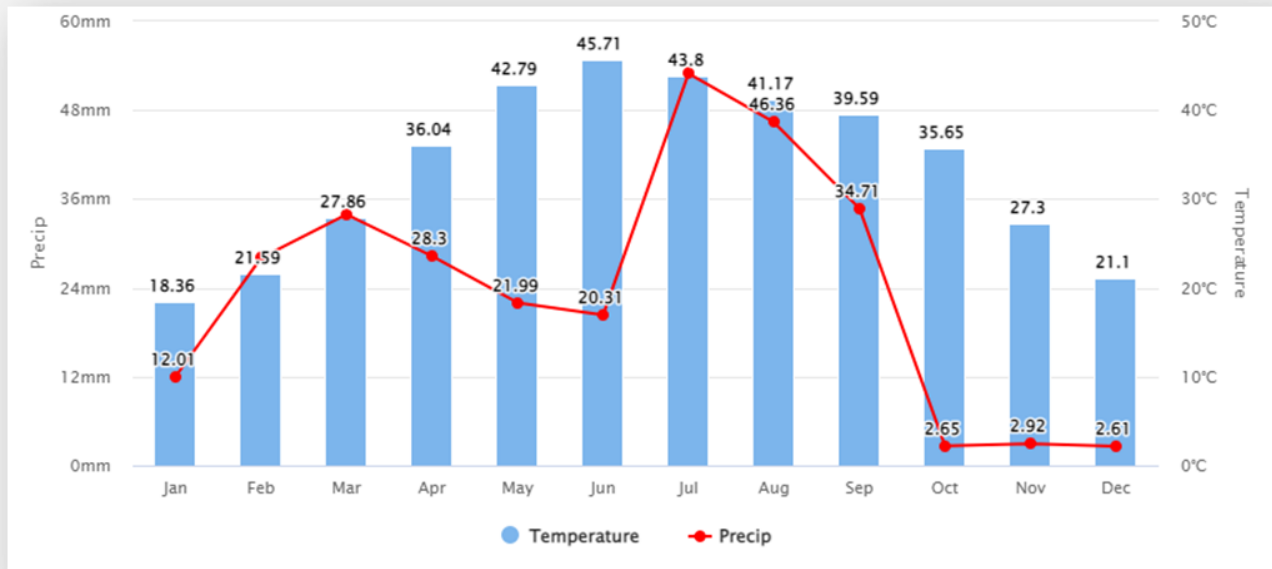
The given below Figure shows the precipitation diagram for District Muzaffargarh on how many days per month, certain precipitation amount is reached. The hot season lasts for 3.6 months, from April 24 to August 12, with an average daily high temperature above 37°C. The hottest day of the year is May 31, with an average high of 42°C and low of 28°C.

The cool season lasts for 2.7 months, from December 3 to February 23, with an average daily high temperature below 24°C. The coldest day of the year is January 9, with an average low of 7°C and high of 20°C.



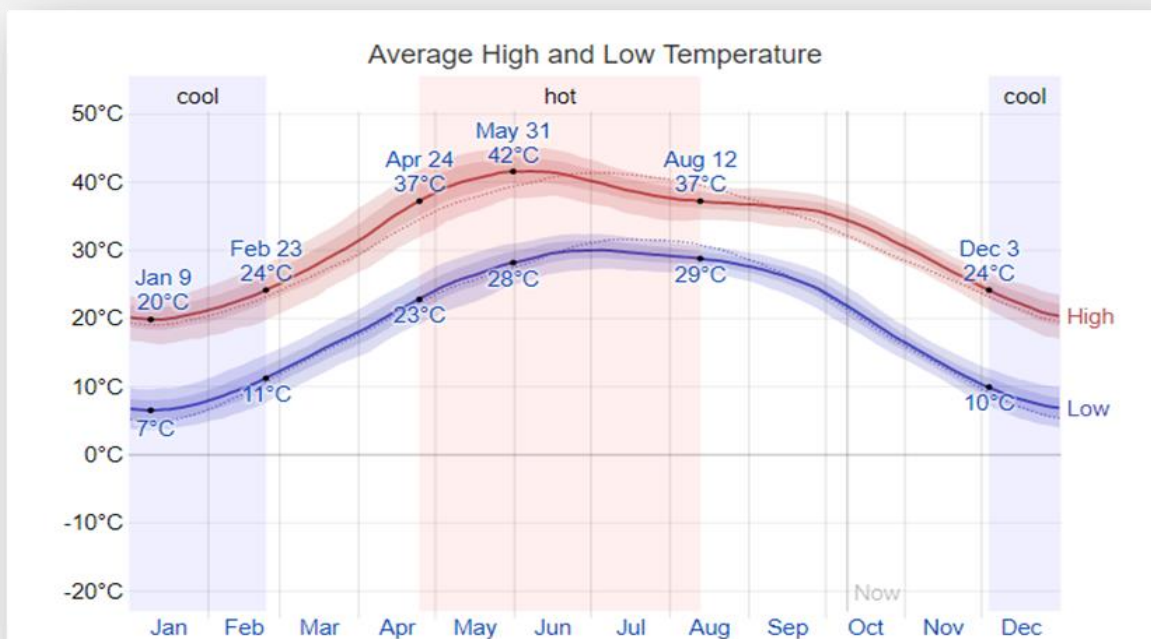
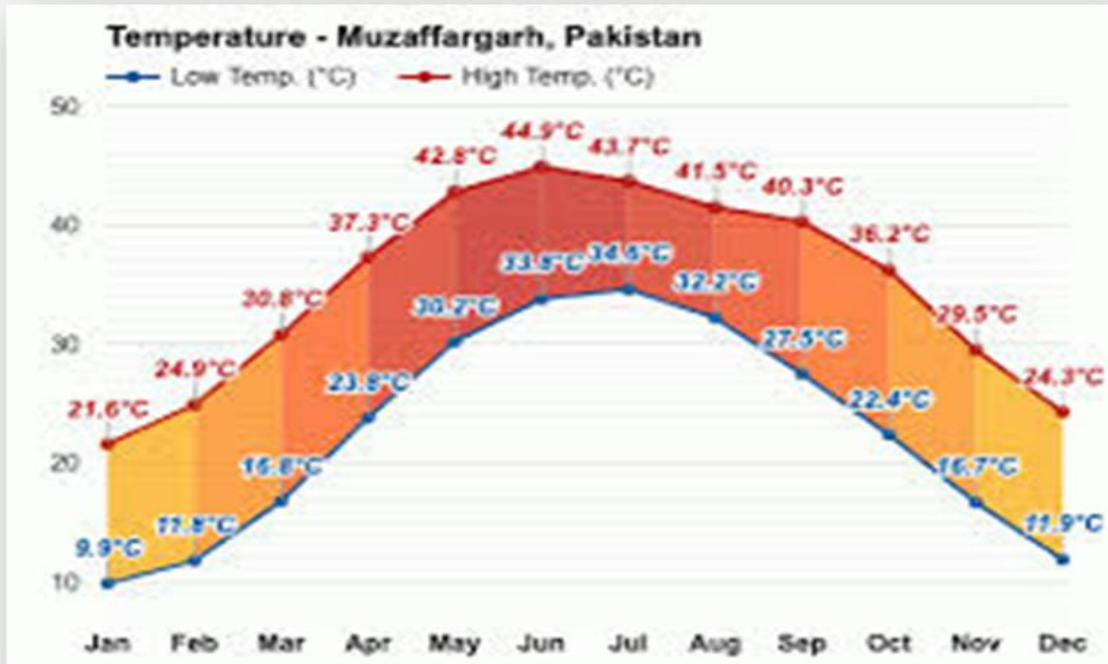


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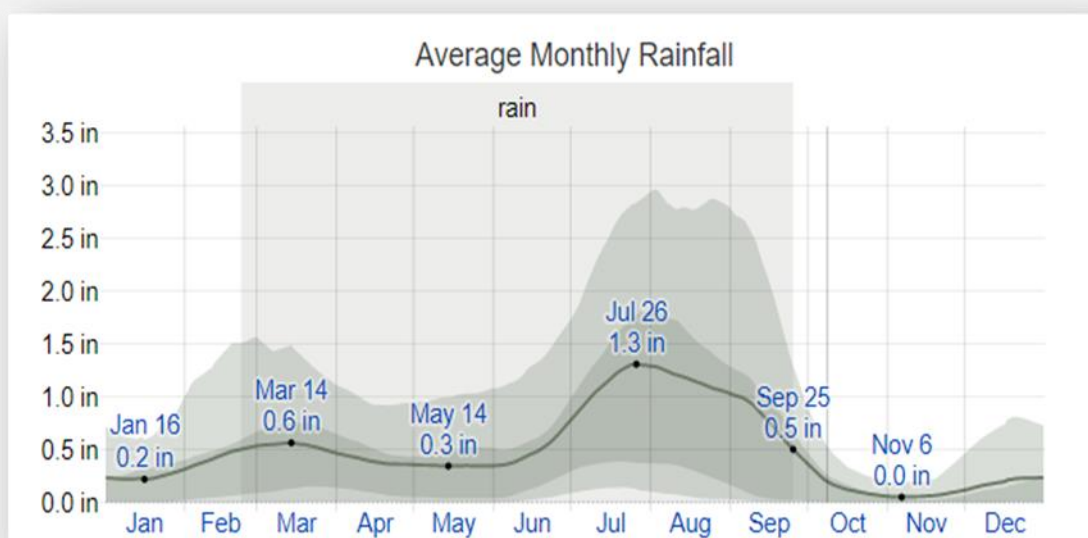




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Average Temperature for proposed study area in District Muzaffargarh

The rainy period of the year lasts for 7.1 months, from February 23 to September 25, with a sliding 31-day rainfall of at least 0.5 inches. The most rain falls during the 31 days centered around July 26, with an average total accumulation of 1.3 inches. The rainless period of the year lasts for 4.9 months, from September 25 to February 23. The least rain falls around November 6, with an average total accumulation of 0.0 inches.



Average Rainfall for proposed study area in District Muzaffargarh

4.1.5. Wind Speed & Direction

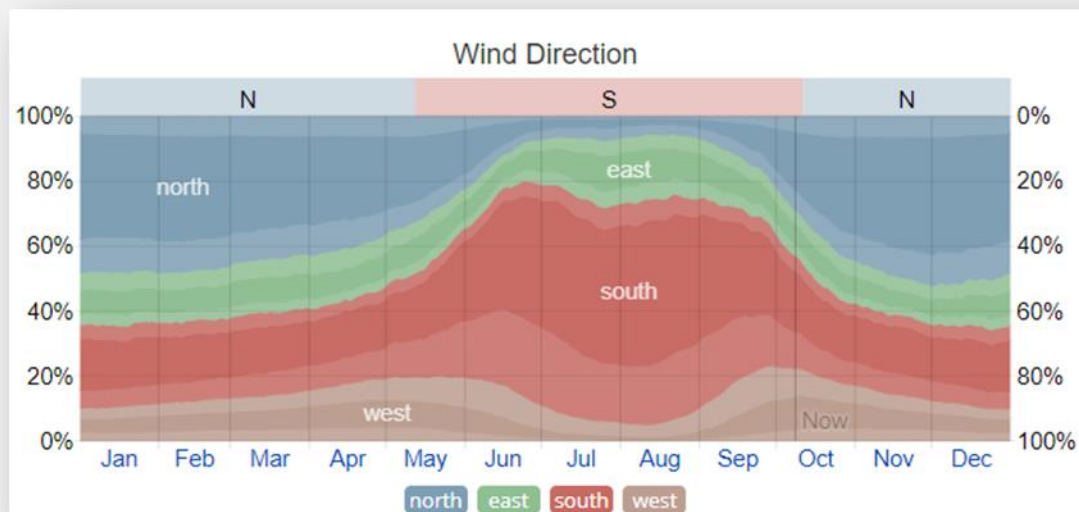
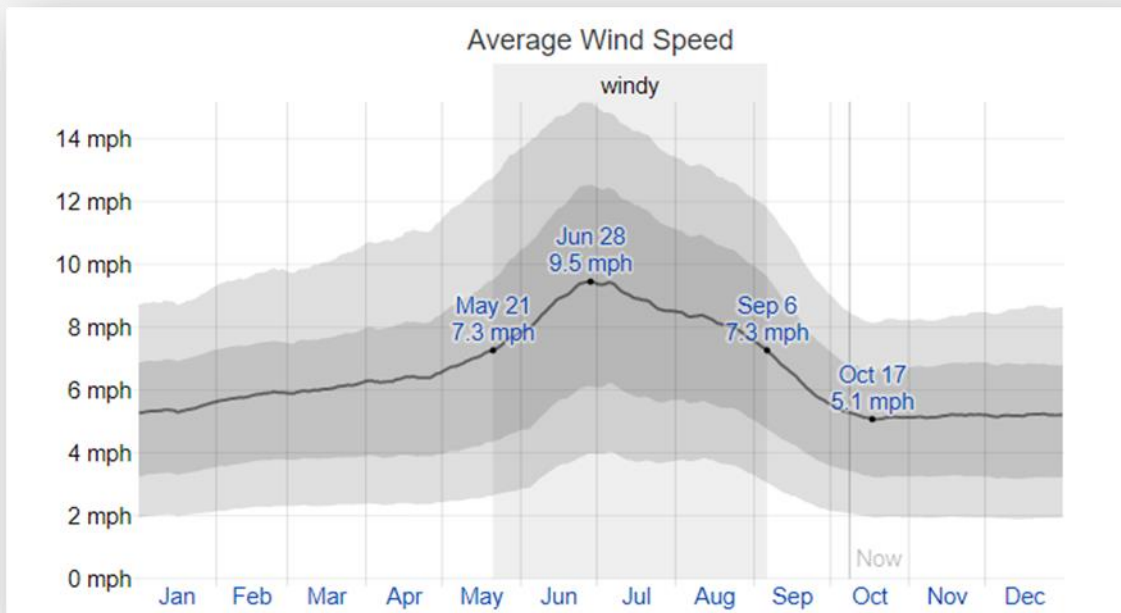
Wind speed and its direction can be estimated from the figure given below. The average hourly wind speed in Muzaffargarh experiences significant seasonal variation over the course of the year. The windier part of the year lasts for 3.5 months with average wind speeds of more than 7.3 miles per hour. The calmer time of year lasts for 8.5 months, from September 6 to May 21. The calmest day of the year is October 17, with an average hourly wind speed of 5.1 miles per hour. The predominant average hourly wind direction in Muzaffargarh varies throughout the





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year. The wind is most often from the south for 5.0 months, with a peak percentage of 70% on July 7. The wind is most often from the north for 7.0 months, with a peak percentage of 48%.





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Wind Roses of proposed project site in District Muzaffargarh

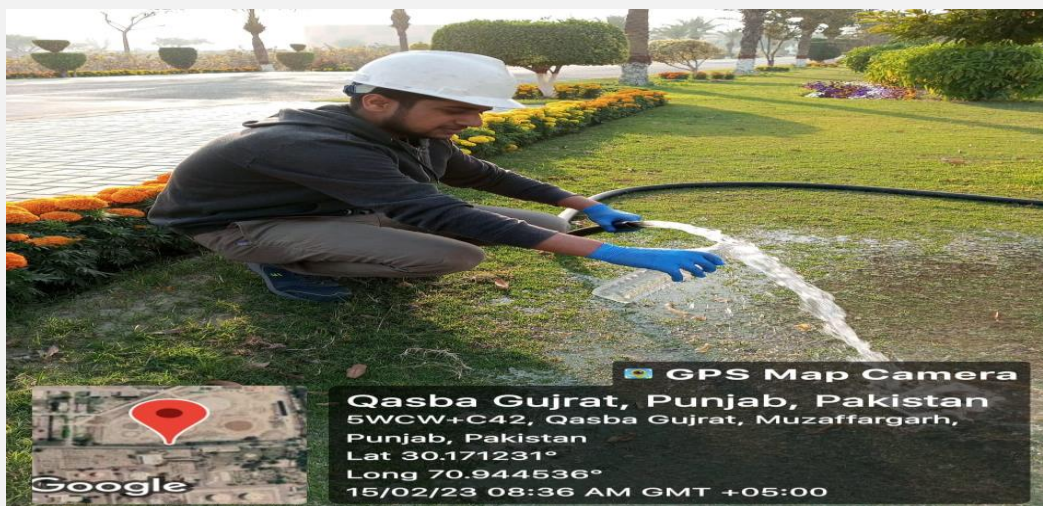
4.2. Hydrology

4.2.1. Surface Water

The Muzaffargarh canal and Indus River are the principal surface water resources in the project area. The Muzaffargarh canal is located about 5 km in the south of the project site which is major source of irrigation. The Indus River flows at distance of about 15 Km on west side of project area. The canal is seasonal one and supply irrigation water during summer and for very short period during winter.

4.2.2. Underground Water

Well water will be used in the establishment of project because there is no civi water supply present in the area. Groundwater can be found at the depth of 25-30 meters. Groundwater quality at depths >30 m deteriorates away from the Thal Doab margins. The underground water is clear and can be used for drinking purpose also. Water Quality test report is given in **Annexure-E**.



4.2.3. Ambient Air

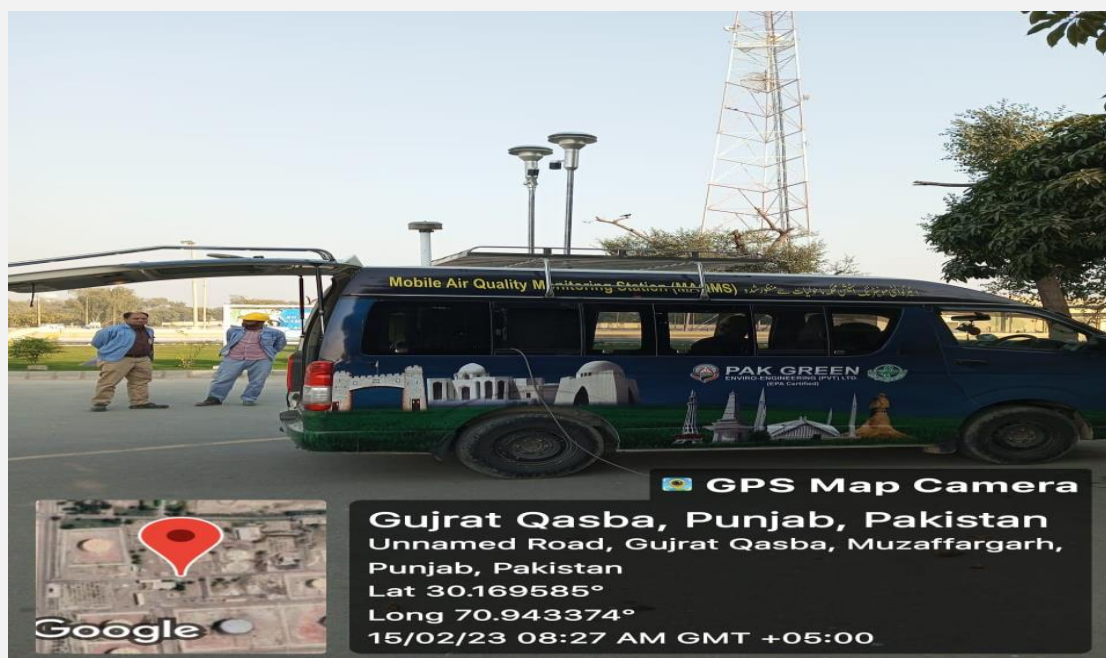
To record the baseline ambient air quality of the project area, monitoring was conducted at advised locations to assess the concentration of priority pollutants (Carbon monoxide, Nitrogen





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dioxide, Sulphur dioxide and PM₁₀) in the air. Ambient Air Quality test report is given in Annexure-E.



4.2.4. Noise Level Monitoring

4.2.4.1. Basic Environmental conditions:

During the measurement following conditions were prevailed on workplace.

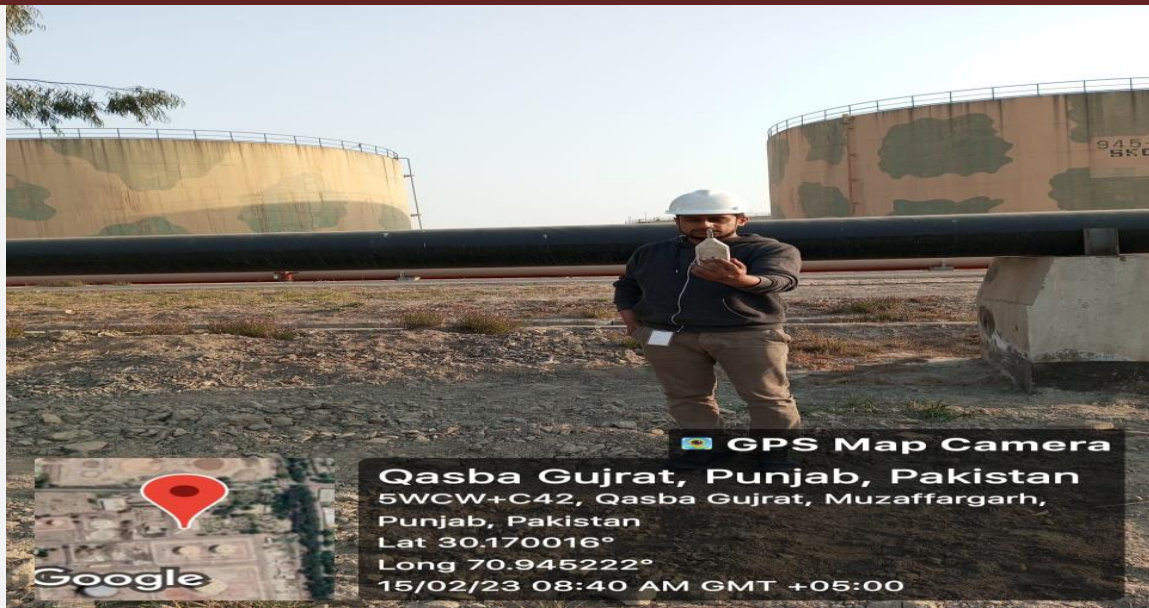
4.2.4.2. Metrological Conditions:

During the noise level monitoring weather was dry and sky was clear. Air was blowing at normal speed. Lab reports of environmental analysis are attached as **Annexure-E** with the report. Pictures of noise monitoring are being attached.





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4.2.4.3. Monitoring Instrument:

The description of the instrument used for the noise level monitoring is given below:

- Name: Digital sound level meter
- Model: AR824
- Company: Intel Instruments plus
- Calibration: Self-calibration time: 10 secs (every turn on)
- Specification
 - i. Resolution: 0.1 dB
 - ii. Overall Range: 30 to 130 dB "A", 35 to 130 dB "C"
 - iii. Sound Level Ranges: 30-80 dB, 50-100 dB, 60-110 dB, 80-130 dB
 - iv. Basic Accuracy: +/-1.5 dB





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v. Sampling Frequency: 2/sec

4.3. Ecological Environment:

4.3.1. Fisheries

The area where site is proposed for project, don't have any lake, river or pound. Therefore, this aspect of environment is out of question for this project.

4.3.2. Fauna:

There are number of locally available birds, reptiles and mammals are present in the project area but there is no protected species.

List of Fauna of proposed project site

Sr. No.	Name of Specie	Local Name	Figure
<u>1</u>	Bubalus bubalis	Buffalos	
<u>2</u>	Bos taurus	Cows	



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<u>3</u>	<u>Canis lupus</u>	Dog	
<u>4</u>	Passer domesticus	House Sparrow	
<u>5</u>	Corvus	Crow	

<u>6</u>	<u>Columbidae</u>	Pigeon	
7	Thanasimus formicarius	Beetle ant	
<u>8</u>	Sympetrum flaveolum	Dragon fly	

4.3.2. Flora

The proposed project site is almost clear only few herbs and shrubs are present at the site. However, trees grown in the area are kikar, shisham, millbury, eucalyptus, and coconut.



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4.4. Socioeconomic Environment:

4.4.1. Demographics:

Major ethnic group is Saraiki speaking Jatt people forming the majority with Saraiki speaking Gujjar, baloch, Rajput and Pathans in minority. Human Development Index (HDI) for Muzaffargarh district is 0.53 for year 2013 which lies in category of Low human development. Muzaffargarh (MZFR) lies on the banks of Chenab River on its east side. The district is home to 4,322,009 people. The district is divided into four tehsils namely Alipur, Jatoi, Kot Addu and Muzaffargarh and 93 Union councils. Rural population comprises of almost 87% of the total population. District is spread over an area of 8345 km² and the area is diverse in its terrain with plain/fertile area, riverine belts and sandy terrains. Due to presence of deserted area, almost half of the land is uncultivated (364,000 Hectares).

At the time of the 2017 census the district had a population of 4,328,549, of which 2,223,085 were males and 2,105,145 females. Rural population is 3,630,138 while the urban population is 698,411. The literacy rate was 47.11%. Muslims made up almost the entire population with 99.78%. At the time of the 2017 census, 88.23% of the population spoke Saraiki, 5.66% Punjabi, 4.51% Urdu and 1.07% Pashto as their first language.

Population	4,322,009 (Census 2017)
Households	667,515 (Census 2017)
Population Average Annual Growth Rate (1998-2017)	2.63
Total area	8,435 square kilometers
Administrative units	Four Tehsils, 93 union councils
Geography	Riverine, canal irrigated and desert





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Land use (Thousand Hectares)	466 cultivated and 364 uncultivated
Key economic activities	Industries (cotton ginning and pressing, flour mills, oil, paper/paperboard articles, petroleum products, power generation, solvent extraction, sugar, textile composite) and Agriculture
HDI ranking national	0.53 (2013)

Demographics of Muzaffargarh (MZFR)

4.4.2. Education

The major ethnic group are the Saraiki-speaking Jatt forming the majority, with Saraiki-speaking Gujjar, Baloch, Rajput and Pathans groups in minority Education:

Although Muzaffargarh is one of the oldest and largest districts of Pakistan by area and population, it still has only a single campus of Virtual University of Pakistan. The literacy rate is one of the lowest in the country. District Muzaffargarh has a total of 1,072 male and 1,009 female public sector schools. According to the School Education Department's data, a total of 5,023 male and 4,130 female teachers are employed in public school education sector of the district. But in the last few years, the city has observed a surge in the number of educational institutions. Colleges include private commerce and science colleges, schools, academies like Punjab Inter Science Academy, and a cadet college. Government degrees are provided for both men and women. Several colleges are affiliated with the Bahuddin Zakrya University, B.Z.U. Multan Pakistan, and Punjab University Lahore Pakistan. The names of some private institutions





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are, Kot Addu School of Economics and Management Sciences (Mr. Fiaz Hussain Malik, director), Punjab Higher Secondary School, Bismillah. Inter Science Academy, Punjab Group of Colleges, My School System, Dar-E-Arqam School, Oxford Grammar School, Professor Academy etc. A Government Technical College is also under construction.

4.4.3. Agriculture

The district has an agricultural land famous for its cotton, wheat and sugarcane production. Other crops such as jawar, moong masoor, Bajra, Moosh, oils seeds, groundnut and maize are also cultivated in the district at minor quantity.

Main fruits of the region are citrus, mangoes, pomegranates and dates. Other fruits of the region are bananas, pears, Jaman and phalsa are also grown in the district in minor quantity.

4.4.4. Forests

Forest covers an area of 100,864 acres of the district. Significant trees grown in the region are coconut, kikar, Millbury, bamboo and Shisham.

4.4.5. Industry

Besides agriculture as major economic activity the district is home to several industries like cotton ginning and pressing, flour mills, oil, paper/paperboard articles, petroleum products, power generation, solvent extraction, sugar and textile composite among various others. According to Agriculture census 2010, average landholding in district is 5 acres with small farmers at almost 93% of total farmers. Major crops grown in district are wheat, cotton, sugarcane, lentils, mango, pomegranate and dates. The production of cotton and pomegranate has decreased over the past 3-4 years while production has been increased for other crops, including Wheat and Sugar Cane in Muzaffargarh.

4.4.5.1. PARCO

PARCO's Mid-Country Refinery is the country's largest and most complex refinery and employs critical processes involved in refining. Commissioned in the year 2000, PARCO's 100,000





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barrels per day, Mid-Country Refinery (MCR) at Mahmood Kot in Muzaffar Garh, represents about 35% of Pakistan's refining capacity. It helps substitute import of approximately US\$ 100 million per year worth of refined, value-added oil products. The MCR mainly processes crude oil of Upper Zakum from Abu Dhabi and light Arabian crude from Saudi Arabia.

4.4.5.2. KAPCO

Kot Addu Power Company Limited (KAPCO) was incorporated in 1996 with the purpose of contributing economic power to the national grid. KAPCO provides services for plant maintenance, availability, quality standards and financial performance. In April 2005, KAPCO was formally listed on all the three Stock Exchanges of Pakistan.

4.4.5.3. LALPIR

Lal Pir (Pvt.) Limited owns and operates Lal Pir Thermal Power station. It is located in Muzaffargarh.

4.4.5.4. TPS MUZAFFARGARH

The Thermal Power Station Muzaffargarh consists of 3 oil-fired steam-operated units of 210 MW, each with provision of adding another 3 units of same or more capacity.

4.4.6. Resources and Development:

The project area has not any private recreational facilities.

4.4.7. Archaeological and Historical Treasures:

There are many places of attraction in the district. People from all over the country love to visit and see different historical sites of Muzaffargarh. Some of the places of attraction are as follow:

- United Mall
- Tomb of Shah Ali Akbar
- Shrine of Khwaja Awais Kagha
- Multan Arts Council





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-
- Fort Kohna
 - Shrine of Mian Maharban
 - Tomb of Shah Rukne Alam
 - Clock Plaza
 - Fort

4.5. Suitability of site

The proposed site for the construction of the Project currently comprises of empty, unutilized land plots. The Project site lies within this zone earmarked for industrial activity of PARCO.

The project does not fall in any environmentally sensitive area.





CHAPTER 5

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & THEIR MITIGATION MEASURES

5.1. Environmental Issues

5.1.1. General

The environmental issues had been identified during literature review, consultation with stakeholders, relevant reports and visits to project site. Various types of environmental issues likely to crop up during the life cycle of project are grouped in the following stages:

- Impacts due to location
- Impacts due to design stage/Site development stage
- Construction stage
- Operation stage

5.2. Environmental impacts due to the project location

5.2.1. Project Location:

The subject proposed project is located at Qasba Gujrat, Mahmood Kot, Kot Addu, District Muzaffargarh under the Name of M/s Pak-Arab Refinery Company Limited (PARCO) over an area of 18396 meter squares.

5.2.2. Impacts

Subject project is present in suburban area of Muzaffargarh; Map is annexed with the EIA. Mainly the observed impact is acceptable and have a no toxic effect on life.

5.2.3. Mitigation measures

- Ample Parking area for the cars and motor cycle should be reserved within the subject project premises.



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- For security purpose Security guard should be there.
- Location can be considered as positive impact on the community due to the Jobs opportunity provided to the community.
- Gas detection system should be placed for the detection of leakage of hydrocarbons to avoid the density of foul smell.

5.3. Site Selection and Design Stage

5.3.1. Land Use Planning

The present plot was empty. Construction of the project will provide the optimum use of the resource.

5.3.2. Presence of Hazardous Conditions

The site is free of any natural and man-made hazardous conditions to cause any negative impact.

5.3.3. Environmentally Sensitive Areas

The area is industrial. Therefore, environmentally sensitive localities do not exist.

5.3.4. Disturbance to other Site Users

The site is not used by others as it is the property of M/s Pak-Arab Refinery Limited (PARCO) so disturbance to other users is out of question. Industry will not be involved to emit offensive odor, noise and other objectionable pollutants/pollution so there will be no environmental pollution issues to the nearby industries.

5.3.5. Availability of Essential Services

Water supply, drainage and sewerage disposal systems are present at proposed site.

5.3.6. Water Supply

Water is needed for cleaning, fire protection and for drinking purpose. Minimum one day's reserve will be kept at the project site. Water will be tested for chemical and bacterial contamination.





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5.3.7. Waste Water

Waste water will be treated in Sanitary Treatment Plant and then directed to drains.

5.3.8. Communication Infrastructure

The project site is well served by road network.

5.3.9. Availability of Construction Materials

The contractors will provide the construction materials like cement, steel and bricks at the site on as required basis. All the construction materials are locally available.

5.3.10. Skilled and Unskilled Labor

These workers are available at economical rates all the time. The project provides the jobs to the local residents as well as to those from the suburban areas.

Extensive operational & maintenance training will be imparted to staff through well-defined training program before and during system commissioning.

5.3.11. Extraction of Ground Water

The water requirement will be fulfilled by PARCO's own installed pump and well.

5.3.12. Traffic Issues

Vehicle access is required especially for transportation. The site is well served with the road network. Heavy traffic will be allowed only during tight time during construction phase. The traffic issues at any stage of project life cycle will not arise.

5.4. Environmental Impacts due to the project design

Subject Project under the name of M/s Pak-Arab Refinery Limited (PARCO) will be constructed in Qasba Gujrat, Area for parking, store room, waste water treatment facility, gas detection system, might be have impact if these revealed facilities would have not been incorporated within the subject project. Firefighting plan, health & safety plan, tree plantation plan,





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emergency response plan must be incorporated during the design phase of the project. The PARCO has their existing facilities which will be also the part of the said project i.e.;

- Security guard rooms
- Main office
- water storage taken for the firefighting and domestic purposes
- Firefighting instrument room
- Parking Area
- Store room
- Generator Room (in future)
- Electricity room

Following are the major Environmental impacts due to the development related to the design:

5.4.1. Impacts

- Foul smell can be generated if the gas detection system would have not been installed.
- Soil structure and soil bearing capacity.
- Road infrastructure design.
- Emergency exit in the proposed project.
- Electrical hazard can be due to improper management of electrical system.

5.4.2. Mitigation measures and recommendations

Following are the mitigation measures and recommendation to minimize the anticipated impacts

- Plant design should be designed as per API-650.
- Emergency exits points should be marked within the project building
- Firefighting system should be designed for the emergency situations.
- Electricity system should be design safe and sound.
- Water storage tanks should be established for fighter fighting purposes.
- Electricity wires should be covered by thick plastic/electricity resistant covers.





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5.5. Impacts during Constructional Stage

5.5.1. Impacts

The construction stage may involve the following vulnerabilities:

- Generation of dust during loading and unloading of construction materials.
- Generation of noise on account of vehicular use and construction activities. On the basis of surveillances, it is noted that background noise level will be within the PEQS limits. These types of problem may arise on activity:
- Oil storage drum can be leak.
- Local flooding due to over-use of water and leakage of pipes.
- Injuries to worker during construction.
- Traffic problem may be arisen during operational phase.
- Any outbreak of fire due to electrical and other failures.

5.5.2. Mitigation Measures during Construction Stage

For Negative impacts in this stage, following mitigation measures are suggested:

- Minor erosion of land after removal of existing vegetation will be reduced due to the pre-constructed boundary wall of the project and step wise clearing of vegetation cover. Land is almost clear and there would be no chance so of land erosion
- Contamination of land will be avoided by keeping the leaching material on concreted surfaces or leaching proof material.
- Safety of construction workers, people in the surroundings and passersby. Occupational Health & Safety means to provide and maintain a working environment in which employees are not exposed to hazards.





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- During Construction activities impacts like dust, noise and flue gases generated from vehicles and machinery will be reduced by effective management system and all parameter will be comply with PEQS by proper tuning of vehicles and machineries and water sprinkling for the dust emission control.
- Construction materials will be stored within the boundary wall of the site.
- Sprinkling of water will be done on site.
- Oils storage drums must be placed over on paved area on the plastics sheets.

5.6. Impacts during Operation Stage

Main environmental issues associated with Project operation are as follow.

- Fire due to short circuits, leakage of tanks and other activities.
- No noise will be generated during the
- Health & safety hazards including the electricity hazardous, fire hazards, handling of tanks, during working and filling of HSD.
- Foul smell due to spillage of HSD
- Vehicle access is required especially for repair & maintenance. The site is well served with the road network. The traffic issues at any stage of project life cycle will not arise.
- About 2-3persons will occupy the project site. The projects' operations will be kept in working condition so that the workers may give their input in environment friendly conditions.
- Management Committee will supervise the smooth functioning of the project site. All the activities will be managed by the qualified and experienced engineers.

5.7. Main Environmental Issues

Main environmental issues associated with project are as follow.

- Health safety issue





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- Leakage of tanks, fire hazards
- Dust/PM during construction phase.
- Noise pollution from generator and other machinery during construction phase.

5.8. Mitigation Measures during Operation Stage

Following points must be implemented during the operation stage.

- Keep water supply, sewerage disposal and electric supply in working condition.
- Keeps the firefighting arrangements in working condition at all times.
- Contacts of concerned departments like fire brigades, police, first aid, etc. should be displayed at prominent places in the project's building.
- A well design firefighting system will be constructed to cope with fire situations in the plaza.
- A watchman will control the traffic at gate during the construction phase
- Project proponent should submit all the monitoring report in the EPA Punjab Office for the compliance of the PEQS
- All the health & safety measures should be ensured to MSDS
- A Material Safety Data Sheet (MSDS) would be accessible to employee to follow the instructions at the workplace. The MSDS provides important information on propane including physical properties, health effects, first aid, safety precautions, and personal protective equipment (PPE).
- This program would provide instruction to handle all management system.

5.8.1. Gas and flame Detection

5.8.1.1. Millennium II Series — Fixed Gas Detection

- Single, multi-channel, or BASIC controller configurations





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- Lowest power consumption of any gas detection package available on the market
- Wide voltage range allows for greater stability and system compatibility
- Universal toxic and LEL gas sensors
are completely interchangeable with controller/
transmitter
- Robust construction and reliable performance designed
for extreme conditions
- Advanced catalytic bead, electrochemical, and infrared sensor technology

5.8.1.2. UV/IRS Flame Detector

- Wide field of view (120°)
- Robust construction and reliable performance developed for extreme ambient
conditions
- Low power consumption, lowers overall costs, increases uptime, allows flexibility, and
lower overall costs
- Analog, HART, Modbus, and relay outputs
- Certified for worldwide use



5.8.1.3. References

- Plant Engineer's Handbook By R Keith Mobley

5.9. Types of Negative Impacts

5.9.1. Minor Impacts

These are of minor intensity. For mitigation of the minor impacts routine and limited actions are required.

5.9.2. Moderate Impacts

These impacts need specific and additional mitigation measures.





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5.9.3. Major Impacts

These impacts have severe adverse impact. These are intolerable. All possible preventive and multiple control measures are adopted to minimize their intensity and duration.

5.10. Impacts on Physical Environments

5.10.1. Groundwater Quality and Level

The proposed project would not affect the quality and level of groundwater. Projected impact is nil.

5.10.2. Land Utility

It will increase significantly since the project has been planned to be constructed on the existing unused area.

5.10.3. Wastewater Generation

Wastewater generation is very low because in construction phase up to 20-25 people will work. For them PARCO has already installed Sanitary Treatment Plant. In operation phase, no new hiring will be made, already hired people will manage the HSD Tank

5.10.4. Solid waste Generation

In construction phase, minor amount of solid waste will generate which will handover with other waste generating during operation of other tanks. During operation of HSD Tank, solid waste which will be the sludge of tanks which settled down in HSD Tank will handover to contractors.

5.11. Impacts on Biological Environments

5.11.1. Flora

The project site is devoid of any significant vegetative cover. Plants are present in the established park. Nil impact is envisaged.

5.11.2. Fauna

The fauna including wildlife species do not exist at the project site. The impact will be nil.





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5.11. Impacts on Socio-economic Environments

5.11.1. Security

Because of presence of security guards round the clock the security at the project site will improve as well as in its vicinity. Impact will be moderate positive.

5.11.2. Land Value

Land value in the surrounding area will increase due to completion of the present project. Impact will be moderate positive.

5.12. Resettlement Issues

5.12.1. Dislocation of Population

The project does not involve dislocation of the people. There is no requirement of resettling a single person. Impact is nil.

5.12.2. Loss of Property/Infrastructure

No movable or immovable property and infrastructure of public and private sectors will be lost or damaged during construction and operation stages. Impact will be nil.

5.13. Environmental Enhancement Measures in Addition

- Sprinkling of water will be done on dusty road and tracks
- PPEs will be provided during construction activity
- Constructional waste and domestic solid waste will be disposed-off or utilized properly
- Local people will be informed in advance when work is about to start in an area
- Machinery will never be left unattended
- Efforts should also be made to discuss traffic conditions so that regular traffic is not disturbed. Transporters engaged for the project would be forced to adhere to the load specifications of the access road. No overloading would be allowed in any case.
- Safety signs and boards will be placed during construction
- Air pollution controlling devices will be installed within the project during operation





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-
- Machinery will be kept maintained
 - Proper SOPs will be followed with proper schedule along with the HSE conditions
 - Area will be restored with native plants. A proper tree plantation plan will be formulated to save the environment
 - Noise will be controlled by adopting proper measures
 - PPEs will be provided to workers during working
 - Firefighting equipment's and system will be installed
 - Safety signs will be placed at all locations where required
 - Hygienic conditions will be ensured and proper quality will be maintained by quality control testing.
 - First aid facilities will be made available
 - Precaution and safety measures will be adopted and followed for health & safety, use of tanks, filling, and storage & handling.





CHAPTER # 6

ENVIRONMENTAL MANAGEMENT & MONITORING PROGRAM

6.1. Purpose and Objectives of the EMP:

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the EIA
- Define the responsibilities of the project proponent.
- Define a monitoring mechanism and identify monitoring parameters in order to:
- Ensure the complete implementation of all mitigation measures
- Ensure the effectiveness of the mitigation measures
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations
- Identify training requirements at various levels.

6.2. Management Approach:

The overall responsibility for compliance with the environmental management plan rests with the project proponent.

6.3. Institutional Responsibilities

Following functionaries will be involved in the implementation of EMP:

- Project Proponent
- HSE/Project Manager
- In-Charge Administration
- Supervisor of project



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-
- Environmental Engineer

Details of Mid-Country Refinery HSE Staff of PARCO is annexed in **Annexure-L**.

6.4. Training of Construction contractor

Training of construction contractor & workers will be the part of the TORs regarding the construction of the building. The provisions given in EIA Report *Chapter 4 Screening of Potential Environmental Impacts & Their Mitigation Measures* will be followed.

TORs will be including the training and submission of reports in the following area:

1. Handling of Machineries in a safe way
2. Use of PPEs
3. Maintenance of vehicles and submission of Environmental Monitoring Reports
4. Maintenance of Water Consumption records
5. Testing of water and waste water and submission of Environmental Monitoring Reports
6. Placement of safety signs/boards during construction
7. Monitoring of generator emissions

Training regarding all other aspects of HSE will be ensured by the contractor during the construction phase.

6.5. Responsibility of EMP

Overall responsibility for implementation of EMP will be that of project proponent. He will appoint a HSE/Project Manager of relevant qualification. HSE/Project Manager will act as Environmental Manager and will manage the all HSE condition at the PEQS.

6.6. Training Schedules

Training for the management/contractors/engineers and workers on environmental aspects of the project will be arranged biannually during the construction phase of the project. It will be imparted by a team of experienced trainers.





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6.7. Environmental Technical Assistance and Training Plan

In order to raise the level of professional and managerial staff, there is a need to upgrade their knowledge in the related areas. HSE/Project Manager should play a key role in this respect and arrange the training programs.

HSE/Project Manager will provide training to staff and workers about the best environmental management practices at the construction site and affective implementation of the EMP.

The training modules will include air, noise and water pollution monitoring, social awareness, Environmental Laws, Punjab Environmental Quality Standards (PEQS), Usage of personal protection equipment's, and health and safety related issues on the construction site.

The HSE/Project Manager will train all workers & staff in basic sanitation and health care issues (e.g., how to avoid malaria and transmission of Sexually Transmitted Infections (STI) HIV/AIDS and in general health and safety matters, and on the specific hazards of their work. Training should also consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation.

HSE/Project Manager will arrange Training on monthly or quarterly basis regarding health & safety, hygiene, firefighting and first aid.

6.8. Proposed Environmental Monitoring Plan:

6.8.1. Ambient Air Quality

Ambient air quality report will be submitted to PEPA biannually by adopting the following recommended methods and frequency.

Priority parameters are given below in the given table:

Sr No.	Parameters	Method	Frequency	Monitoring By
1	NO _x	40 CFR Part 50, App F (US-EPA)	Biannual	Third party certified lab
2	SO _x	EQSA-0197-114 (US-EPA)	Biannual	Third party certified lab





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3	CO	40 CFR Part 50, App. C (US-EPA)	Biannual	Third party certified lab
4	PM _{2.5/10 um}	UPEPA- EQPM-0798-122 UPEPA-CFR-40 Appen J	Biannual	Third party certified lab

6.8.2. Noise Level

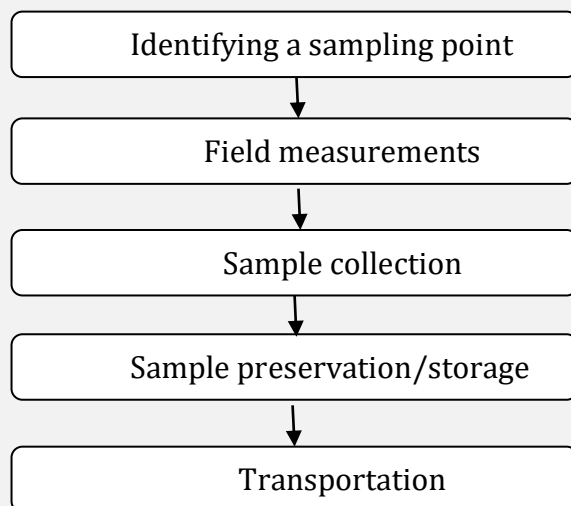
A sound level meter or sound meter is an instrument that measures sound pressure level, commonly used in noise pollution studies for the quantification of different kinds of noise, especially for industrial, environmental and aircraft noise. Noise level should be monitored by EPA certified method using standard noise level meter and reports should be submitted to PEPA on quarterly basis. The current international standard that specifies sound level meter functionality and performance is the IEC 61672-1:2013.

6.8.3. Water sampling

Following methodology will be adopted for water sampling and analysis:

6.8.3.1. Sample Collection:

The water samples will be collected from identified sampling points. The sampling will be carried out in accordance to the SOP based on the recognized methods of United State Environmental Protection Agency (UPEPA), World Health Organization (WHO) and American Public Health Administration (APHA) for water sampling and analysis.





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Steps Involved in water sampling

6.8.4. Measurement of Field Parameters:

Parameters that quickly degrade after they will be sampled must be tested in the field. Following parameters will be measured in field that can significantly change during storage and transportation.

- pH
- Odor
- Color
- Temperature

6.8.4.1. Preservation:

Preservation is important in order to minimize the changes in the sample. The collected water samples should be preserved in appropriate containers as per Guidelines.

6.8.5. Sample Identification and Chain of Custody:

The collected samples should be labeled and assigned a unique sample identification number, sampling date and time of collection to collected samples. All the relevant information (sample location, time of collection, sample identification, temperature, pH, collected by, preservation techniques etc.) will be recorded immediately on the Chain of Custody form signed by Pak Green field Analyst.

6.8.5 1. Transportation:

A shipping container (Ice box with eutectic cold packs instead of ice) with maintained temperature of $4^{\circ}\text{C} \pm 3^{\circ}\text{C}$ must be used for transporting the sample from the collection site to the environmental laboratory.

6.8.6. Methodology for Drinking Water

Methodology for drinking water is given below:

Table 1: Drinking Water Testing Methods





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Sr. No.	Parameters	Method / Technique
1	pH	APHA-4500-H ⁺ B
2	Electrical Conductivity	Conductivity Method, TDS meter
3	TDS	APHA-2540 C
4	Turbidity	Nephelometric Method
5	Taste	By Sensory
6	Odor	By Sensory
7	Total Hardness	EDTA Titration
8	Arsenic	APHA-3120 B
9	Chloride (Cl ¹⁻)	APHA-4500-Cl B
10	Sulphate (SO ₄ ⁻²)	APHA-4500-SO ₄ C
11	Fluoride (F ¹⁻)	APHA-4500-F-C
12	Total Coli-form	MPN

6.8.7. Waste Water

Waste water quality should be tested on regular basis and the lab reports third party should be submitted to PEPA, at least quarterly basis.

Table – Impacts & Mitigation Measures

Serial	Environmental Issues/ Impacts	Mitigation Measures
PLANNING, SITE SELECTION AND DESIGN STAGE		
1	Observance of administrative and legal formalities	It is recommended for obtaining of approval from other relevant departments





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2	Acquisition of land	The proposed land is the property of the project proponent
3	Loss of environmentally sensitive areas	There is no any sensitive area near the project site however the project proponent will achieve the PEQS at the boundary wall of the subject project to avoid the environmental impacts on the nearby community
4	Changes in traffic pattern	There is no need to change the traffic pattern due the development of the subject project because only few vehicles will visit the project on daily basis.
5	Potential conflicts with stakeholders	There is no any conflict at the current stage of the project. People of the surrounding area have no any objection regarding development of the subject project as per proposed design. It is recommended to Settle the issues through scoping and specific group discussions.
6	Resettlement issues	No resettlement issues
7	Project Design	Structure Stability Assessment of soil should be done, as per Tank design i.e. total area of Tank structure of the tank, etc. Provision of Emergency Exits, Assembly Points, firefighting arrangements, water storage for firefighting should be incorporated in the design. Installation of Dust/flue gases/odor controlling devices should be incorporated in the design. Project proponent is committed to provide all these provision in the design of the project.

SITE DEVELOPMENT STAGE

1	Erosion due to stripping and site clearance	Sprinkling of water on road side or dusty tracks
2	Generation of noise	Avoid suing forbidden horns at the site.





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		Do not throw heavy equipment and construction materials in haphazard manner.
3	Outbreak of fire	Firefighting equipment must be maintained at the site in good working condition.
4	Safety	Safety of the workers and others must be ensured. Privacy of the neighbors must not be disturbed.
5	Labor issues	Employ the local labor as far as possible Wages of the labor should be as per Government policy
CONSTRUCTION STAGE		
1	Minor erosion of land	- There are two types of erosions: 1. Wind Erosion 2. Water erosion - It is recommended to construct the boundary wall first that will reduce the soil erosion due to wind and chances of water erosion due to water flow from the adjacent will be reduced also. - Clearing of land should be step wise; vegetation should be removed only from the area where main building will be developed. - Add more vegetation, restore the land by more plantation - Sprinkle water on dusty tracks is recommended
2	Contamination of land and water	Hazardous substances like oil, fuel, etc. should be kept on concreted surface. Essential services like water supply, sewerage disposal and solid waste management must be in working condition.





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3	Impacts of dust, noise and flue gases on neighbors	Sprinkle water on dusty tracks is recommended Avoid suing forbidden horns at the site. Do not throw heavy equipment and construction materials in haphazard manner. Proper tunings of vehicles and machinery must be ensured. Schedule construction timings should be implemented for minimum disturbance to neighbors. Continuous Environmental monitoring must be ensured as per proposed monitoring plan.
OPERATION STAGE		
1	Contamination of land and water sources	Continuous vigilance on maintenance of services Plastic sheets must be placed to avoid leaching of oil into ground Proper checking and maintenance of tanks must be ensured to avoid any leakage Careful handling, storage and transferring of oil must be ensured.
2	Fire breakouts	Training of workers regarding flammable substances will be ensured. SOPs of fire prevention will be adopted like forbidden of smoking, regular testing of electricity infrastructures and regular testing of gas supply system to the industry. Firefighting equipment must be kept in working condition at site
3	Safety/security concerns	Safety of the workers and others will be ensured. Privacy of the neighbors will not be disturbed.
4	Malfunction of utilities	It is proposed to appoint maintenance engineer with technicians like





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		plumber and electrician for smooth operation of utility services.
5	Occupational Health, Safety and Environment	• Regular medical check-ups must be ensured to improve the working condition and efficiency of workers. • Relevant safety devices like belts, gloves and testers must be strictly used by the operators at the work site. • Safety of management, workers and visitors must be ensured. • Observance construction and safety codes must be ensured. • Provision of emergency exits must be ensured.





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Sr. No .	Environmental Parameter/ Element	Mitigation measure to be taken during:			
		Construction	Regular operations	Recommendation	
	PHYSICAL ENVIRONMENT				
1	Health & safety	Workers/people will be informed in advance when work is about to start at the project site. This may result in people keeping young children away from work areas. Machinery will never be left unattended. Safe driving practices will be adopted, particularly while passing through human settlements. Basic health facilities will be provided to workers.	Training of workers will be conducted regarding health and safety, firefighting and health hygiene. Use of PPEs will be implemented at workplace. First aid measures will be provided to workers. Shift Rotation, proper ventilation will be provided to workers in case of thermal stress. Safety signs, safety boards, exit arrows etc. will be placed on site. An Assembling point will be kept to gather in case of emergency situation such as fire hazards. Fire Fighting Equipments & system will be enhanced Floor will be kept clean without	According to HSD storage and handling fact sheet following measures are recommended. Keep the tank valves closed when not in use and fit and tighten the plug to the tank valve internal thread. Ensure that the Tank is stored properly at all times and is not at risk of tipping over. Inspect the tank on a regular basis to ensure it is in good condition, free from rust and housed properly. The HSD Tank should be in good condition, and must be free from damage and rust. The HSD Tank valve should be clean and in good condition. The hoses and appliance fittings should be in good condition. Give special attention to the rubber O-rings and	Project Manager / Operations Manager /HSE Manager





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			slippery to avoid any hazard. Electric wires, D. Bs will be kept covered & closed. Machinery will never be left in running condition. Safe drinking water will be provided to workers and staff (admitted by the proponent) Keep away from heat and flame. Accidental release in case of spill or leak In case of fire, use water spray, dry chemical, foam or CO2. Water may cause frothing. Tank and equipments should be marked and tagged properly Keep the tank valves closed when not in use and fit and tighten the plug to the tank valve internal thread. Inspect the tank on a regular basis to ensure it is in good condition, free	rubber parts used on HSD regulators, and replace these as required.	
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		from rust and housed properly. Store the tank in a secure location to protect against falling, damage, being hit by ride on mowers, vandalism, etc. The HSD Tank should be in good condition, and must be free from damage and rust. The HSD Tank valve should be clean and in good condition. Proper housekeeping should be ensured Proper housekeeping will be ensured In order to avoid any fire hazard, use of drugs and narcotics SHOULD BE prohibited during working hours at workplace. A proper smoking zone/area should be designated for the smoking and is allowed only in free hours.		
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			Handling and storage will be done as per handling and storage guidelines. Also, MATERIAL SAFETY DATA SHEET (MSDS) LIQUEFIED PETROLEUM GAS AND PROPANE. must be followed there.).		
2	Emissions of VOC's	Nil	Unit will not cause much VOCs emissions during functioning.	Storage tank should be designed as per API-650 which ensure that major parameters vapor pressure, molecular weight of the product, tank characteristics, diurnal temperature, paint factor, tank capacity, and number of turnovers should be designed in such way which ensures least VOC contents emissions.	Operations Manager
3	Gaseous emissions and particulate matter/dust emissions	Construction materials i.e. sand, clay shall be transported to the project site as per HSE Rules. Dust may generate during unloading of raw materials. Sprinkling will be done on dust tracks to control the particulate	Unit will not cause much gaseous emissions during functioning. No dust will be emitted as all the area will be paved with proper road access. PPEs such as masks will be provided.	To control any discrepancies, arise during handling of tanks keep away the tanks from heat, hot surfaces, sparks, open flames and other ignition sources. Use only non-sparking tools.	Operations Manager





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		matter. All equipment, generators, and vehicles used during the project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions. All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke. Ambient air quality has been monitored for baseline study and results have been incorporated within the report in <i>chapter Description of the Environment</i>.	All the places within the unit should be paved to avoid any dust emissions during loading/unloading and transportation of tanks. Machinery & vehicles should be maintained properly Monitoring should be conducted as per EPA PEQS Rules 2000	Use only explosion-proof equipment	
4	Firefighting	Nil	Fire hazards during the handling, storage of the HSD. Fire extinguishers like CO2 water type Dry Chemical Powder type,	Firefighting plan should be formulated. M/s Pak-Arab Refinery Company Limited (PARCO) <i>has</i> incorporated the firefighting detail in lay out plan.	HSE Manager / Operations Manager





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		foaming type/AFFF will be made available at the site. Fire hydrants of the types reel type & canvas pipe type will be made available at site. Fire pumps of adequate capacity, fire tanks will be made available at site. Fire action plan Fire action plan will be formulated including arrangements for giving warnings, emergency telephones numbers are available at site. The manual for fire detection system will be maintained at site. The management will train all the employees/workers to reach the assembling point at the time of alarm within 15-20 minutes in case of any hazard.		
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			Fire exits points are available at site at different locations. Emergency exits through the front & side windows are available. Emergency Response Plan is attached as Annexure-F.		
5	Storage and Handling	Nil	Handling should be in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of the material from eyes, skin and clothing. Wash thoroughly after handling. Always use appropriate Personal Protective Equipments (PPEs). Store in cool, dry area away from sun and heat. Keep containers tightly closed. Exposure to small amounts of moisture, even moisture in air, causes polymerization and renders the product unusable. Keep away	Storage and handling should be as per MSDS and Govt. regulations	Operations Manager





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			from heat, sparks, flame and other ignition sources. Disposal of should be in accordance with federal, state, and local regulations		
6	Water supply	It shall be ensured that no activity tempers with the water supply system.	It shall be ensured that no activity tempers with the water supply system. Project proponent committed to provide safe drinking water to all workers and staff	Use the water as per need only. Do not waste by any means.	Operations Manager / Project Manager
7	Noise	In order to avoid noise in the project area, vehicles will be properly tuned and training of operators/drivers will be conducted Ear plugs will be provided & implemented in case of heavy noise. Noise level monitoring has been conducted for the baseline study	No activity producing extra ordinary levels of noise will be allowed as a policy matter. Ear plugs, ear muffs will be provided & implemented in case of any noisy work environment. Noise Monitoring will be conducted as per EPA-PEQS RULES 2000	If noise level exceeds the prescribed limits, then M/s Pak-Arab Refinery Company Limited (PARCO) Unit will adopt proper mitigation measures by regular maintenance of the vehicles. .	Operations Manager / Project Manager / HSE Manager





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		and results have been incorporated within the report in <i>chapter Description of the Environment</i> .			
8	Odor	Nil	Regular maintenance of Tank and valve is recommended	Regular maintenance of tank and valve is recommended	Operations Manager
9	Traffic related problems	The vehicles number will be regulated in a way that no stampedes occur on the site. None of the vehicles will be parked on the road or foot paths in front of the building.	Proper parking area will be reserved for staff and visitors' vehicles No vehicle or motor cycle will be allowed to be parked in the front of the road. There would be no traffic issues due to this project A traffic controller will be designated to control the flow of traffic and avoid congestion Heavy traffic visit schedule will be followed, minimum use of horns at the site and provision of ample parking within the premises of site.	Visiting vehicles	Operations Manager / Project Manager
10	Trash burning	No trash burning will be allowed in or out side the site.	No trash burning will be allowed in or outside the site.	Solid waste or discarded material should be handed over to contractor	Operations Manager / Project Manager / HSE Manager





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BIOLOGICAL ENVIRONMENT					
11	Fauna and Flora	Proposed site is devoid - off any protected species of both fauna & flora	Awareness programs will be planned regarding the protection of fauna & flora. Species of Indigenous plants will be planted at site. Animal/reptiles/birds Hunting will be prohibited	Proper tree plantation plan should be developed	Project Manager / HSE Manager
SOCIOECONOMIC IMPACTS					
12	Resettlement issues	There is no any issue of resettlement due to the construction of the subject project.	There will not be any issue of resettlement due to the operation of the subject project.	Neighbor's privacy should be on priority.	Administration Manager
13	Change in culture & language	Maximum employment of Local people is recommended to preserve the local cultural language. It will help in communication with the local people to resolve any emerging issue near the project area	Maximum employment of Local people is recommended to preserve the local cultural language. It will help in communication with the local people to resolve any emerging issue near the project area	Local people should be preferred	H.R. Manager
14	Education	School and colleges exist in the area. The project proponent will initiate an educational awareness	School and colleges exist in the area. The project proponent is committed	Educational assistance should be provided	Proponent





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		program.	to initiate an educational awareness program and will provide educational facilities for the children of the workers.		
15	Health	Heath facility already exists within the area The project proponent should provide first aid facilities at site and also social security and medical checkups of the workers.	Heath facility already exists within the area The project proponent is committed to provide first aid facilities at site and also social security and medical checkups of the workers.	First aid and medical facilities should be provided within the unit	Proponent
16	Culture, Norms of the area	Maximum local employment should be ensured to preserve the culture of the area	Maximum local employment should be ensured to preserve the culture of the area		Proponent
17	Gender inequality	Women involvement in decision making process should be ensured. Equal employment opportunity in	Women involvement in decision making process should be ensured Equal employment opportunity in	Public participation should be ensured	Proponent





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		suitable department of the proposed project should be ensured	suitable department of the proposed project should be ensured		
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6.9. Equipment Maintenance Detail

The subject project is the proposed construction of HSD Tank. The company will maintain the records for Health Safety & Environment and will hire HSE manager to check and deal with the HSE issues. The company shall maintain PPEs, medical facilities, firefighting Equipments as fire buckets, fire hydrants and fire extinguishers and records for their periodic fillings or replacement.

6.10. Environmental Budget

The cost required to effectively implement the mitigation measures is important for the sustainability of the Project both in the construction and operation stages of the Project.

Company allocated the Environmental Budget for the Training, maintenance and management of Environment is 2% of total cost annually that will include filling and maintenance of equipments, restoration, plantation, and availability of PPEs, strategic planning to cope with any emergency situation and formulate the disaster management plan to cope with natural disaster. Any equipment or devices failure or replacement will not be included in this budget.

6.11. PARCO's Latest CSR Initiatives in Muzaffargarh

Details of PARCO's Latest CSR Initiatives in Muzaffargarh are annexed in **Annexure-M**.

CHAPTER # 7

STAKEHOLDERS PARTICIPATION

Public discussions were held with the inhabitant of the surrounding area. They are quite positive to the project and see the project as growing business. The people observe strong positive impacts regarding employment, business and structural development due to this project. EIA findings depict that people perceive overall positive social and economic impacts by the project. Their attitude towards the project installation is highly optimistic. Majority of the people are convinced for development in the area and they correlate this progress with the pace of their social mobility but they were also concerned with scenic beauty of the area and employment which the proponent has ensured to maintain the aesthetics of the area, reclaim the land and also to provide jobs/employment during installation and at the time of functioning of the project. Moreover, project proponent admitted to adopt all the mitigation measures to control any impacts resulting from the subject project.

7.1. Methodology of consultation:

The EIA team carried out public consultations at various locations around the Project Site and conducting group meetings with different group of stakeholders. The stakeholder's consultation during this phase of the work targeted the project area, administrative and private offices, Govt. offices, shops, etc. near the Project area:

- Selection of the stakeholders for consultation, reconnaissance of the project site and initial discussions with the local community, residents, education institutes, health institutes, hospital and NGOs, shopkeepers, drivers etc.
- Environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

7.2. Stakeholder identification:

Stakeholders must be considered at all levels according to the importance of the project. They may be at provincial, district and village level. The process of consultation is an ongoing process which continues during the project life cycle and even after the submission of this environmental assessment report and so on. Therefore, three-tier approach was adopted. Stakeholders were identified, categorized and consulted at provincial (EPA Punjab, Irrigation department, Agriculture department, Wildlife department, mines and mineral department, metrological department etc.), district level (EPA, Irrigation department, Agriculture department, Wildlife department etc.) & village level (Direct & indirect concern persons)

Consultations with government, provincial and district level departments were carried out through meetings and visits while consultations with locals, villagers, neighbors and directly

7.3. Proponent's Environmental Management Team

Possible impacts and mitigation measures related to the storage and refilling of the HSD were discussed with the project proponent and management. They assured to take all suggested mitigation measures to control any discrepancy arose by the project and to make the project environmentally friendly.

7.4. Responsible Authority

Management of M/s Pak-Arab Refinery Limited (PARCO) is the responsible authority to take all measures prior to the HSD process activity.

7.5. Other departments and agencies

For the impact analysis detailed meetings were held with the management of M/s Pak-Arab Refinery Limited (PARCO) community, education institutes, health institutes, hospital and NGOs. Issues were discussed that may affect the environment and also the implementation of proposed project. All possible mitigation measures were considered and incorporated in the Environmental Management Plan.

Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area. The purpose of such consultations is to obtain the feedback from the relevant persons.

7.6. Environmental Practitioners and Experts

Team of M/s Pak Green Enviro-Engineering (Pvt.) Ltd. visited the project site, had discussions with stakeholders and consulted with the local people of nearby and other villages to evaluate the project socio-economic impacts. People of the area belong to different professions like mostly belong to employment, own businesses, doctors, in Army, teaching, in agriculture, etc. Women were also consulted for their point of view regarding the betterment of the area by this project, some of them communicated but according to social value of the area they mostly hesitate to communicate comfortably and get pictured. People provide the massive information about the project and have positive remarks regarding the project development.

7.7. Affected & Wider Community

There is no affected community present in the radius of our study area. PGEE team has consulted with the inhabitants of the different area. They provided positive remarks regarding the subject project and in the favor of the subject HSD process activity for the proposed cement plant. Stakeholders' participation Performa's and socioeconomic questionnaire were get filled by the inhabitants to evaluate the project socio-economic impacts. Stakeholders' participation Performa & socioeconomic questionnaire annexed in **Annexure-H**. Pictorial evidence of consultation is attached.



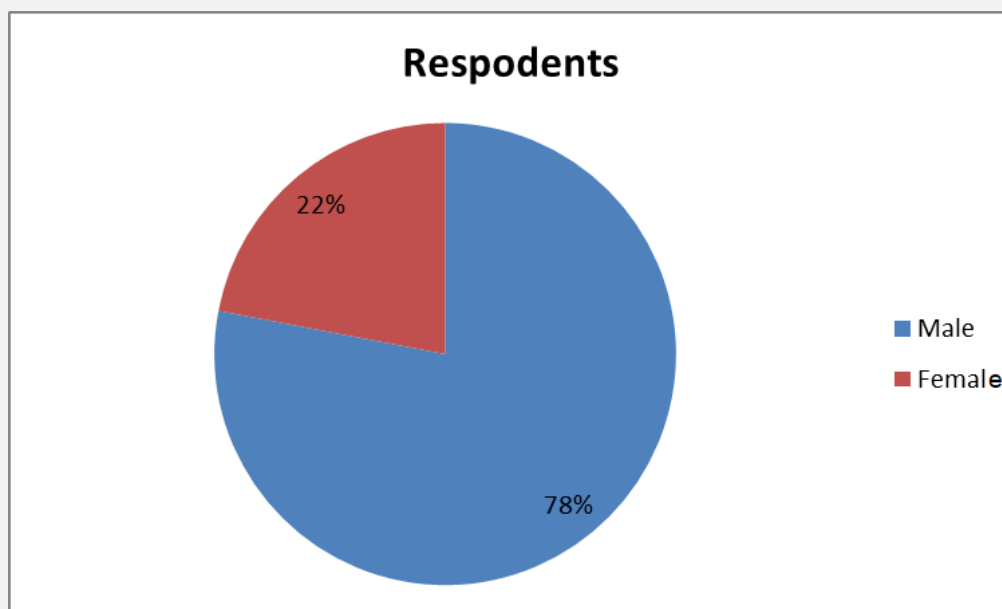
7.7.1. Sample size

15 sample sizes were selected by the Team of consultants for conducting the socioeconomic survey. Women were also consulted for the said survey; some of their names are mentioned in the above list of respondents while most of them were not willing to give personal information.

7.7.2. Statistical Analysis

SPSS 19.0 has been used for the statistical analysis of the data collected during the visit of study site villages through questionnaires.

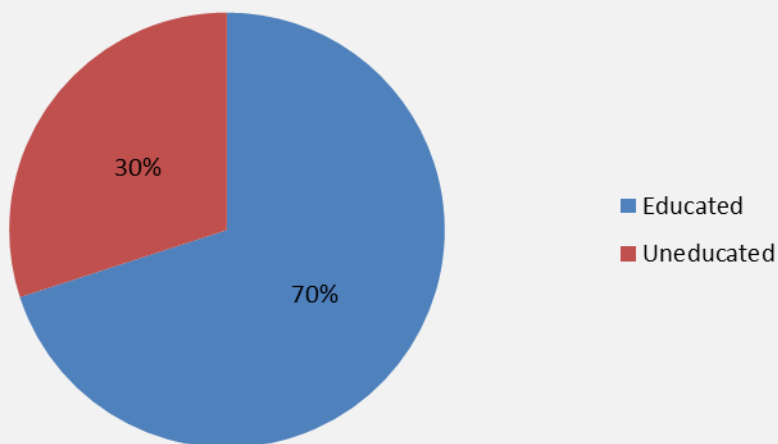
Results & Discussion



Discussion:

According to graphical representation, 78% respondents were male while 22 % respondents were female. The number of female respondents is less as compared to male respondents because according to the social binding female hesitates to respond or communicate comfortably.

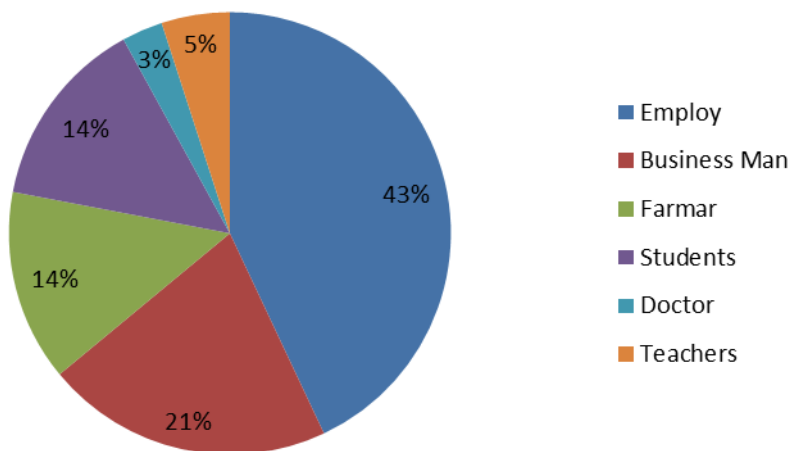
Education Status of Respodents



Discussion:

According to above graphical representation, 70 % respondents were educated while 30 % were uneducated. So, according to the survey overall education status of the area is good.

Income Source of the Repodents

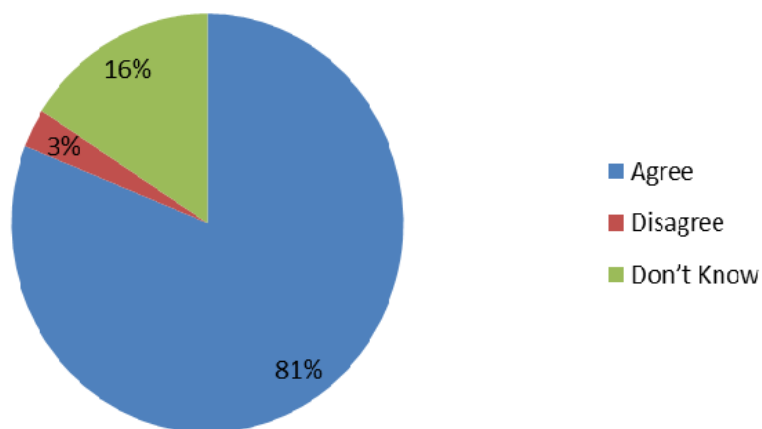


Discussion:

According to above graphical representation, source of income of majority of the respondents in the area was mainly employee in the private and government sectors while all other respondents'

source of income was business man, farmers, students, doctors and teachers.

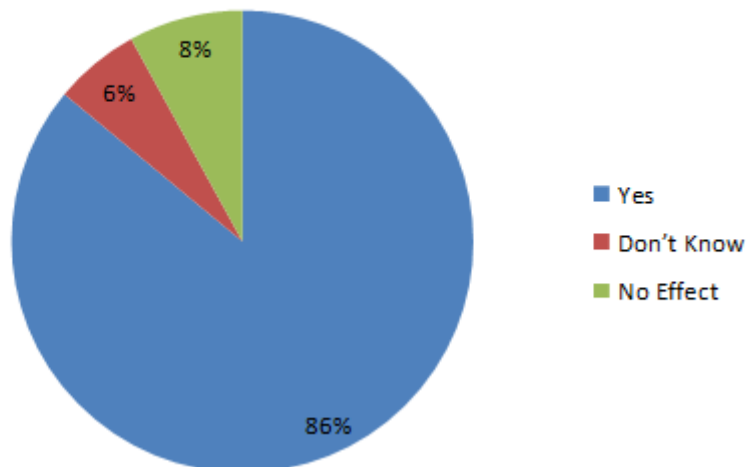
People in the favour of HSD process activity



Discussion:

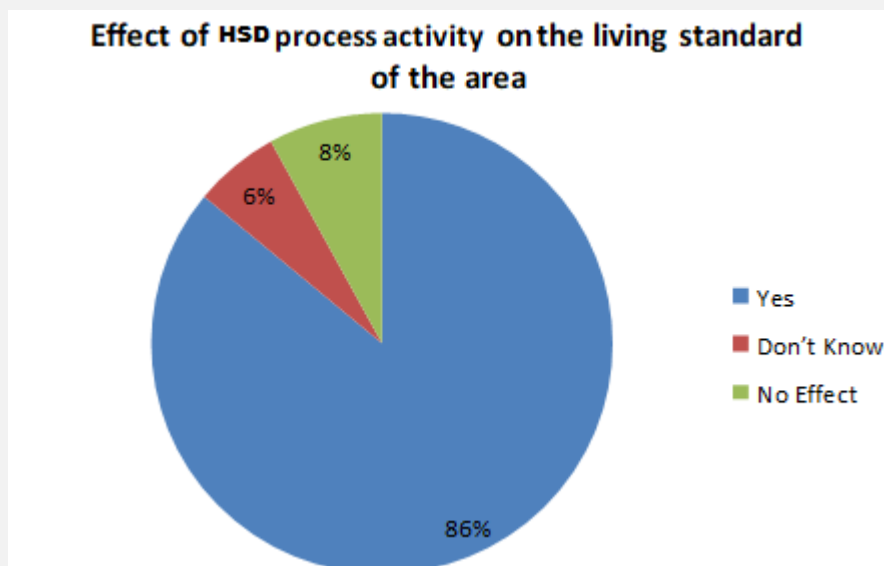
As per survey, 81% people were in the favor of the HSD process activity and they gave positive remarks regarding the subject project while 16% respondents were have no opinion regarding the project and only 3% respondents were not in the favor of the subject project due to their concern regarding the aesthetic degradation of the and no preference to local people for jobs.

Effect of HSDprocess activity on the living standard of the area



Discussion:

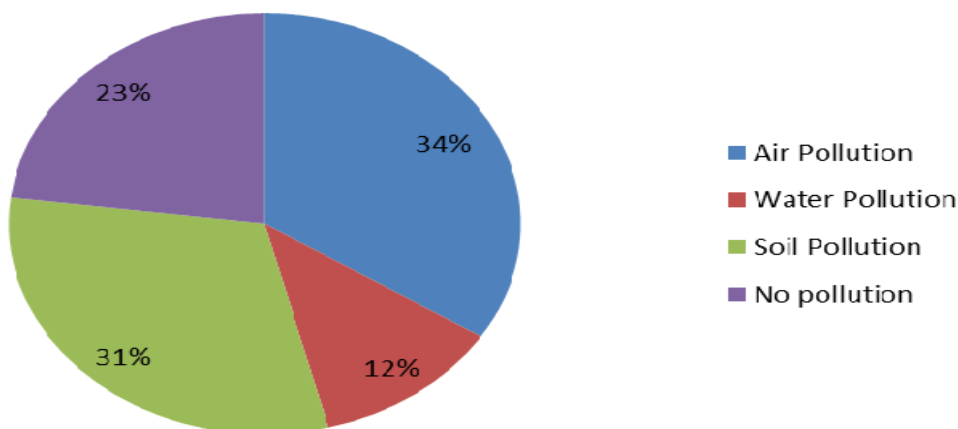
As per survey, 64 % respondents remarked that there will be less effect caused by the HSD process activity on the area environment while 14% respondents had no point of view regarding the HSD process activity, 13% respondents remarked that subject activity will cause greater effect on the environment of area and only 9% remarked that HSD process activity will have no effect on the environment of the area.



Discussion:

As per survey, 86% respondents said that HSD process activity will enhance the living standard and income level of the area, 8% said that there will be no effect on the living standard and income level while only 6% respondents had no remarks regarding the subject project.

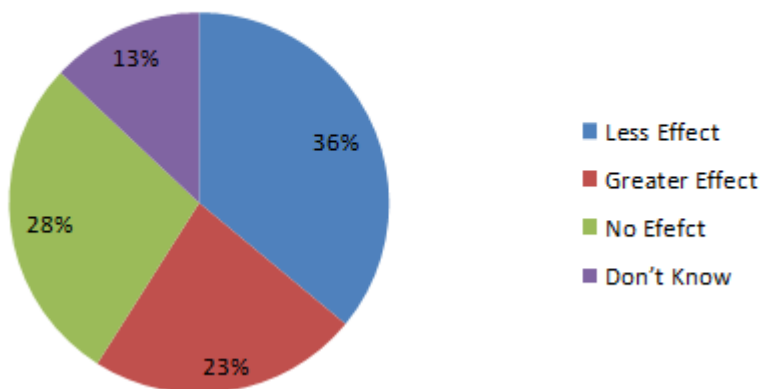
What Type of pollution caused by the HSD process activity



Discussion:

As per survey of the area and graph indicates, some people gave remarks that there will be higher air pollution (i.e. 34%) by the subject HSD process activity, some people said that there will be soil pollution (i.e. 31%) by the subject activity, some people said that there will be no pollution caused by the subject project while some people said that there will be water pollution (i.e. 23%) caused by the subject activity.

**How Much Effect Casued by the HSD process activity on
the Plants species of the Area**



Discussion:

As above graph indicates, 36% of the respondents remarked that there will be less effect caused on the plants species by the HSD process activity, 28% said that there will be no effect caused on the plants species by the subject activity and 23% said that greater impact will be caused by the subject project on the plants species while 13% respondents had no remarks regarding the subject project effect on the plants species.

CHAPTER # 8

CONCLUSION AND RECOMMENDATIONS

8.1. Conclusions

- The EIA study reveals that the project is economically viable, socially acceptable and environment friendly.
- On completion of the project M/s Pak-Arab Refinery Limited (PARCO) will serve the people of Kot Addu, District Muzaffargarh and whole country.
- It will generate additional jobs during construction and operation phases.
- The proponent has committed to implement the project in the environment friendly manner.
- Project proponent intends to register the project with local Government.
- M/s Pak-Arab Refinery Limited (PARCO) will prepare and implemented very comprehensive Emergency Preparedness and Response Standard Operating Procedures.
- The project proponent has prepared and implemented very comprehensive Security and Fire Fighting Standards Operating Procedures.

8.2. Main environmental issues are as under:

- Health & Safety Issue
- Fire Hazards
- Emission from generator
- Dust emission during construction phase

8.3. Recommendations

- In view of the comprehensive screening process and findings of the present study there is no need of conducting further investigations.
- Energy efficient system will be installed.
- Flame detector must be installed at the process site.
- Gas detector must be installed to eliminate the foul smell as well as to stop further gas leakage.
- Tree plantation is recommended.
- The untreated wastewater will not be reused for irrigating the vegetation and lawns or drained out into drain without treatment.
- High standards of biosecurity and safety will be enforced during operation stage. Safety of the workers will be top priority for the management.
- The project manager will continue to assist the local communities as a corporate/social responsibility.
- Water treatment system will be installed in case of any waste water discharge
- Use of narcotics and smoking will be prohibited during working or handling of HSD tanks.
- PPEs will be provided to workers such as gloves, masks, etc.
- Proper solid waste management system will be adopted
- MSDS should be followed
- Plant should be constructed as per API-650.
- Safety signs, safety boards, exit arrows etc. will be placed on site.
- Machinery will never be left in running condition.
- First Aid measures, health & safety Equipment (PPEs) will be provided to workers.
- An Assembling point will be kept within the unit to gather in case of emergency

situation such as fire hazards.

- Fire Fighting equipment & system will be installed in case of fire hazards.
- Floor will be kept clean without slippery to avoid any hazard.
- Electric wires, D. Bs will be kept covered & closed.
- Shift Rotation, proper ventilation will be provided to workers in case of thermal stress.

The present EIA report is enough to meet the administrative and legal framework. Therefore, the environmental approval may be accorded for the present project.