

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

**Proposed Installation of Incinerator at
M/S GEO LINKS PVT. LTD
located at Ghang Road, Machike,
Mahaal Jamber Tehsil & District
Sheikhupura**

**Report submitted by:**

M/s Geo Links Pvt. Ltd

Proponent: Mubin Ahmed Aziz

R/O Ghang Road, Machike, Mahaal
Jamber Tehsil & District Sheikhupura.

Contact: 0332-1314340

Report prepared by:

A.S. Enterprises

Office # 617 Garden Heights Barkat
Market, Lahore

Contact: 0345-4646406



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LIST OF ABBREVIATIONS

EIA	Environmental Impact Assessment
CFPP	Coal Fired Power Plant
PEPA	Pakistan Environmental Protection Act
PEPA	Punjab Environmental Protection Act
NEQS	National Environmental Quality Standards
WAPDA	Water And Power Development Authority
WASA	Water and sanitation authority
EMP	Environmental Management plan
EMC	Environmental Monitoring Cell
WWTF	Waste Water Treatment Facility
NOC	No Objection Certificate
NCS	National Conservation Strategy
Pak-EPA	Pakistan Environmental Protection Agency
W.H.O	World Health Organization
LESCO	Lahore Electric Supply Company
SWM	Solid Waste Management
CSR	Corporate Social Responsibility
MSWs	Municipal Solid Wastes
TMA	Town Municipal Authority



dB (A)	Decibel
PPM	Part per million
KVA	Kilo Volt Ampere
PPE	Personal protective equipment
TDS	Total dissolve solid
TSS	Total suspended solid
SS	Suspended solid
COD	Chemical oxygen demand
BOD	Biological oxygen demand
HC	Hydrocarbons
PM	Particulate matter



Executive Summary

Title and location of project:

The subject proposed project is installation of incinerator under the name of M/s Geo Links Pvt. Ltd located Ghang Road, Machike, Mahaal Jamber Tehsil & District Sheikhpura. The project mainly deals with the storage, handling & plan to incinerate the waste by installing three chambers of incinerator in project area. Waste, by definition, is something that the producer no longer requires and therefore discards. In many industrial economies, the traditional approach to waste has been to dispose of it as cheaply as possible, without much concern as to what happens once the waste leaves the producer's premises. Incineration of waste materials converts the waste into ash, flue gas, and heat. Ash may be disposed of in landfill sites. The ash is mostly formed by the inorganic constituents of the waste, and may take the form of solid lumps or particulates carried by the flue gas. This proposed installation of incinerator will be liable to solid waste managements and air pollution control technologies.

The total area of the proposed project is 1 Acre. The total cost of proposed project is approximately 50 million.

According to the Punjab Environmental Protection Act 1997 (Amended 2012) and its interpretation as per Review of IEE & EIA Regulations, 2022 for filling, review and approval of environmental assessments, the present project is categorized in the category G-1 of Schedule-II for EIA, of PEPA, Regulations, 2000, requiring Environmental Impact Assessment (EIA).

Project proponent

Name	Mubin Ahmed Aziz S/O Aziz Uddin Ahmed
CNIC	42201-8611840-9
Designation	Proponent



Mailing Address

Ghang Road, Machike, Mahaal Jamber Tehsil &
District Sheikhpura

Consultant:

A.S. Enterprises is an independent company, who conducts IEE, EIA, EMP and other environmental investigations through its panel of environmental consultants, public participation practitioners and experienced environmental managers.

Address: Office # 617, Garden Heights Barkat Market, Lahore

Contact: 0345-4646406

Details of consultant are given in chapter 1 (Introduction)

Brief outline of project:

Table 1: Brief outline of the project

Name of Company	M/s Geo Links Pvt. ltd
Purpose of the Project	Installation of Incinerator for incineration of solid waste.
Land Requirement	
Total Area allocated for proposed project	1 Acre
Status and location	
Site for proposed Geo Links Pvt. ltd Project	Ghang Road, Machike, Mahaal Jamber District Sheikhpura
Description of project	The project is construction for installation of incinerator. Specifications of incinerator will be according to regulations. This project involves storage, handling and incineration of solid waste.
Water Requirement	



Water consumption for the project	1000 Gallon
Ways of extraction	Motor pump,
Boring Depth	Approx ,700ft
Source of Water consumption	Underground.
Amount of waste water	75-85% of total used water
Source of waste water	Constructional and Domestic Waste
Mode of treatment	During land development and operational phase septic tanks will be installed for treatment of domestic waste water. As there will be no process water in operation phase, so waste water will be domestic in nature.
Mode of Disposal	Drain out into nearby Drain.
Name of drain	Industrial drain
Distance of drain from subject project	Approximately 15m from the boundary wall of estate
Solid Waste	
Source of solid waste generation	Constructional waste and Ash generated from incinerator during operation phase.
Mode of disposal	Dispose of in our own vicinity, which is approximately 2 meter far from project site.
Manpower	
Labor Force	About 10-12 persons during construction and 03-04 persons during



	operation phase.
Power requirements	
Source of power	WAPDA estimated load 50 KVA

The major impacts:

Table 2: Major Impacts and mitigation measures

Impacts	Mitigation Measures
Project Location	
• Acquisition of land • Loss of environmentally sensitive areas • Changes in traffic pattern • Potential conflicts with stakeholders • Resettlement issues	✓ It is recommended for obtaining of approval from other relevant departments. ✓ The proposed land is the property of M/s Geo Links Pvt. Ltd ✓ There is not any sensitive area near the project site. ✓ Many other industries are also working near the project site. ✓ The project proponent will achieve the NEQS/ PEQS at the boundary walls of the subject project to avoid the environmental impacts on the nearby industrial unit. ✓ There is no need to change the traffic pattern due the development of the subject project because no. of industries has been developed at the same road. ✓ It is recommended to settle the issues through scoping and specific group discussions. ✓ No resettlement issues
Project Design	
• Structure stability • Soil structure and soil bearing capacity • Road infrastructure design • Emergency exits	✓ Structure stability of the project building should be ensured ✓ Geotechnical investigation of the project site should be conducted. ✓ Safe road infrastructure design should



• Firefighting system • Wastewater disposal system design • Electricity hazards • Ventilation	be provided at the project site. ✓ Emergency exist points should be marked within the project building. ✓ Firefighting equipment must be maintained at the site in good working condition. ✓ Efficient wastewater disposal system should be designed for proper treatment of wastewater ✓ Electricity system should be designed safe and sound. ✓ Proper ventilation should be ensured in the project building.
Construction and operation phase	
Land & Soil	
• Land or Soil Erosion during the construction phase • Habitat destruction • Scarring of the landscape and aesthetic beauty. • Clearing of native plants will disturb the complexity of the ecosystem of the proposed area. • Leakage of oil from storage area may contaminate soil	✓ Sprinkling of water is recommended ✓ After construction phase, the project proponent will restore the land by plantation. ✓ All spoils will be disposed of as desired and the site will be restored back to its original conditions ✓ Aesthetic of The area will be maintained. ✓ Oils, lubricants, chemicals, and other listed hazardous materials should be stored safely at their designated spots, enclosures or store rooms, which should be safe from rainfall and away from any potential source of fire
Air pollution and Dust emission	
• The transportation of the project machineries and material also may cause dust. • Un-metaled roads may cause dust. • Dust raised On dirt tracks by project-related vehicles. • Dust from drilling of deep holes. • Combustion products from vehicles used for project-related activities	✓ Air emissions controlled devices must be installed to control the air pollution ✓ Water the construction site periodically to minimize fugitive dust generation while laying foundation ✓ Store all construction materials in a manner to minimize generation of dust and spillage on roads. ✓ During excavation works drop heights will be minimized to control the fall of



	✓ materials reducing dust escape. ✓ Sprinkling of water must be done to control the dust or PM ✓ Vehicle emissions inspection should be done on regular basis ✓ Sprinkling should be done on the unpaved area to avoid dust pollution/particulate matter. ✓ Vehicles/ trucks should be serviced regularly ✓ All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke.
Noise	
• The major sources of the noise at proposed project site are project related machinery. • High noise level cause hearing loss, deafness, high blood pressure, headache, depression and mentally disturbance. • Noise level will not exceed 75 dB(A) at the distance of 2 km radius, activity site is located at a safe distance from the nearest human settlement . • Noise from construction activities from site preparation, earth works, foundation and plant equipment installation	✓ Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the workers and other staff of the subject project. ✓ Proper maintenance and tuning of the vehicles should be done. ✓ Sound proof room should be built for generator (if any) to control the noise. ✓ A speed restriction of 40 km/h will be imposed on all construction vehicles.
Waste Water	
• Domestic waste water from the camp • Minor generation of waste water from construction activity. • Water Contamination due to improper storage of construction material,	✓ Domestic waste water will be drained out in nearby local drain after treated in septic tanks ✓ Oils, lubricants, chemicals, and other listed hazardous materials should be stored safely at their designated spots, enclosures or store rooms, which



• Water contamination Due to improper debris disposal, • Spread of diseases, underground water contamination	should be safe from rainfall
Solid waste/Ash	
• Solid waste may generate from construction activity, domestic and packing material of project related machineries. • Solid waste may generate from operation of project.	✓ A solid waste management division should be formulated to deal with the proper disposal of solid waste, supervised by HSE Manager, SW Manager, and other related personnel. ✓ Solid Waste generated from the construction activity as sand, stones residues etc. that should be utilized in restoration of the quarry area whereas solid waste from the domestic sources should be disposed off properly ✓ Proper solid waste management system is recommended. ✓ Solid waste related to the operation will also manage in scientific way. ✓ Ash generated from Incinerator will be disposed of in Landfill Site .
Health and Safety	
• Health and safety issues will be arose during construction activity, handling of material, machinery and improper practices of work • Health safety issue may arise during regular operations	✓ Use of PPEs should be implemented at workplace. ✓ First aid measures/medical facility should be provided to project related employees. ✓ Safe drinking water must be provided to workers, staff, and poor people of the area. ✓ Water consumption records should be Maintained ✓ Safety signs & boards should be placed at during construction activity. ✓ Construction site should be fenced properly to avoid any damage to nearby settlements ✓ smoking or any drugs should be



prohibited during working hours or performing work

✓ At the time of earthwork, fencing will be ensured for the area under the exploration

Proposed 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 following Environmental Parameters is recommended:

- **Ambient Air , stack and vehicular emissions**

Monitoring for stack and vehicular emission should be conducted during construction phase of the project and report should be submitted to EPA Punjab.

- **Noise**

Regular monitoring for noise level should be maintained periodically during construction phase of the project and report should be submitted to EPA Punjab.

- **Water quality**

Regular monitoring of water quality should be conducted on monthly basis during construction phase of the project 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.



Chapter# 1

Introduction

This Section of the report provides an overview of the rational of the Project, objective of project, requirement of the project, purpose of the report and approach adopted to conduct the Initial Environmental Examination (EIA).

The project mainly deals with the storage, handling & incineration of various type of Industrial waste (solid waste). Waste, by definition, is something that the producer no longer requires and therefore discards. In many industrial economies, the traditional approach to waste has been to dispose of it as cheaply as possible, without much concern as to what happens once the waste leaves the producer's premises. This attitude is now changing as greater environmental awareness is reflected in more stringent waste management legislation and a genuine desire on the part of industry to improve environmental performance and meet customers' expectations. The environmental risks associated with poor waste management are well known and understood. Carelessly disposed of wastes, such as solvents, can leach into the groundwater and contaminate drinking water supplies. Poorly planned and managed landfills will create a significant neighborhood nuisance, and where landfill gas and leachate are not properly treated there will be a serious threat to the safety of local residents. Old, closed dumps and landfills are likely to be contaminated land which may be difficult or dangerous to remediate and redevelop.

Incinerators operated without adequate pollution abatement equipment will release highly toxic dioxins. Even recycling and composting facilities can be a source of litter and unpleasant odor if not properly regulated. Waste producers carry their share of responsibility to ensure that such polluting incidents do not occur. Under no circumstances should hazardous wastes be discharged into the environment in an effort to —save money, as a matter of —convenience, or due to carelessness in planning, preparation, operations or design.

Purpose of the report:

The purpose of Report is to conduct Environmental Impact Assessment (EIA) of proposed project. The EIA is conducted under the Legal framework of Pakistan Environmental Protection Act, 1997 and Review of IEE/EIA Regulations, 2000 to seek the Environmental Approval.

In compliance with the applicable Environmental Regulations, proponent decided to get the NOC of the project, through consultants. In order to fulfill the legal requirement of Punjab Environmental Protection (Amendment) Act 2012, Section 12; for obtaining No Objection Certificate from Environmental Protection Agency (EPA), Government of Punjab, Lahore, this Environmental Impact Assessment (EIA) Report is being submitted to the said agency. The EIA Report, as desired by EPA, has been prepared according to the prescribed by the —Guidelines for the Preparation of Environmental Reports, 1997^{II} and —Review of IEE/EIA Regulations, 2000.^{II} The other relevant regulations and guidelines considered while preparing this EIA report includes:

- Policy and procedures for filing, review and approval of the environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participants
- Guidelines for sensitive and critical areas.
- Detailed sector guidelines.

This EIA identifies, describes and evaluates the potential environmental impacts that could result from the implementation of the project, and include possible cumulative impacts from all the activities. It also identifies required environmental permits relevant to the project. As appropriate, the affected environment and environmental consequences of the project may be described in terms of regional overview or site-specific descriptions. The Report also identifies measures to prevent or minimize environmental impacts. The report highlights existing environmental, social, physical and other aspects of the area. It also provides necessary measures to be taken to mitigate any environmental impact. The monitoring plan is also described in the report. The EIA Report describes environmental, socio- economic, physical, and environmental, land use, crops, forestry, water bodies, bio diversity and other relevant aspects associated with this project. It also describes mitigation measures to be adopted. The EIA Report also provides information as desired under the format used to help decision makers, EPA Punjab in the present case, before issuing the desired NOC.

Scope of the 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 NEQS, 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

Identification of project:

According to the Punjab Environmental Protection Act 1997 (Amended 2012) and its interpretation as per Review of IEE & EIA Regulations, 2000 for filing, review and approval of environmental assessments, the present project is categorized in the category G-1 of Schedule-II for EIA, of PEPA, Regulations, 2000, requiring Environmental Impact Assessment (EIA). Further, the client is required to fulfill the legal requirements of the Section-12 of the Punjab Environment Protection Act 1997(Amended 2012). 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**.

Details of Proponent:

Name	Mr. Mubin Ahmed Aziz S/O Aziz Uddin Ahmed
CNIC	42201-8611840-9
Designation	Proponent
Mailing Address	Ghang Road, Machike, Mahaal Jamber Tehsil & District Sheikhpura

CNIC of the proponent and other relevant documents are attached as **Annexure-B** of the report.

Project Title:

The subject project is Installation of Incinerator under the name of —M/S Geo Links Pvt. Ltd located at Ghang Road, Machike, Mahaal Jamber Tehsil & District Sheikhpura.

Details of Consultant:

A.S. Enterprises is an independent company, who conducts IEE, EIA, EMP and other environmental investigations through its panel of environmental consultants, public participation practitioners and experienced environmental managers.

Address: Office # 617, Garden Heights Barkat Market, Lahore.



Contact: 0345-4646406

The current study was carried out by the following professionals:

Table 3: Team of consultant conducted EIA

PERSON NAME	DESIGNATION
Mr. M Sami Ullah	Director
Mr. Awais Saleem	Environment Officer
Ms. Aroz Ejaz	Environment Consultant
Mr. Bilal Ahmad	Environmentalism
Mr. Nadeem Akhtar	Environmentalism
Mr. Abdul Haseeb	Field Officer

Nature, size, and location of project:

Nature and size of the project:

The subject project involves the installation of Incinerator under the name of M/S Geo Links Pvt. Ltd Located Ghang Road, Machike, Mahaal Jamber Tehsil & District Sheikhpura. Subject project deals with storage, handling and incineration of solid waste. The total land area of the subject project is 1 Acre. The capacity of incinerator is 6000 Kg/Batch. The capital cost of project is approx. 50 million.

Location

Project site is located Ghang Road, Machike, Mahaal Jamber Tehsil & District Sheikhpura.

Front: Agricultural land

Back: Agricultural land

Right: Agricultural land



Left: Building

Layout map of the project is attached as **Annexure-C** of this report.



Area of the project:

Total area of the project is 1 Acre. A complete layout map of the area is annexed (Annexure-C) showing the details of length and width of the area occupied by the Subject project.

Cost of the project:

The total cost of the project is approx. 50 million.

Need of IEE/EIA Study:

According to the section 12 of the Punjab Environmental Protection Act 2012, no proponent of a project shall commence construction or operation unless he has filed with the Federal Agency an initial environmental examination or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained from the Federal Agency approval. Subject to the provision of this Act, Proponent Muhammad Amin must get a

NOC for construction of proposed project, under section 12 of PEPA-2012 from Provincial Agency in order to start.

The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project. The EIA report has been prepared under the format of guidelines issued by EPA. The applicable laws for the environmental study of the project are briefly given below:

- Punjab Environment Protection Act, 2012
- National Environmental Policy, 2005
- Review of EIA and EIA Regulations, 2000
- Guidelines for Preparation and Review of Environmental Reports, 1997.
- Solid Waste Management Rules 2005
- National Environmental Quality Standards 2000
- Punjab Land Use Rules 2009

Objectives of Environmental Impact Assessment

The objectives of EIA are as follows

- To access and establish the existing environmental condition of the area.
- To implement and execute environmental safeguards.
- To propose mitigation and monitoring measures that can be incorporated into the operation of the project to remove or reduce any damaging effects as far as possible.
- To prepare an EIA Report as per the relevant guidelines for submittal to the concerned EPA.

Extent of EIA Study

Following factors have been taken in the account to assess the Environmental Impacts of the proposed project:

- Environmental impacts due to land use, location, waste generation, utility services consumption and emergency spillage etc.



- Environmental impacts of physical resources i.e. soil, topography, geology, climate, air quality etc. ecological resources i.e. flora and fauna as well as health and safety of workers.
- Scoping identifies the key issues of concern at an early stage of planning process to assess range of impacts and need for EIA. Scoping is a process of interaction. Scoping identifies boundaries of the EIA study, important issues of concern
- It identifies concerns, evaluates them, organizes and presents them to assist analysis and decision making. For achieving the above objective, the study is mainly divided into the following sub tasks.
- Identification of the various legal/statutory requirements as set forth by the Punjab Environmental Protection Act, 2012 and the guidelines for preparation of EIA Reports and Review of existing regulatory framework in the country with reference to the development projects
- Collection of data related to physical, ecological and socio-economic resources of the project area
- Review the available data, drawings and report to ascertain their adequacy and need for collection of additional data
- Identification and evaluation of salient environmental impacts
- Identification of necessary mitigation measures to minimize the adverse impacts.
- Preparation of Environmental Management Plan (EMP)

Structure of the Report:

The EIA report is divided into 7 chapters and appendices as:

Chapter 1: Covers introduction to proposed project

Chapter 2: Presents Project Description

Chapter 3: Describes in detail the Existing Environmental Baseline conditions of the study area

Chapter 4: Exhibits the Impacts Assessment and their Mitigation Measures

Chapter 5: Outlines the monitoring plan and EMP to implement the suggested mitigation measures

Chapter 6: Explains the Stakeholders Participation

Chapter 7: Gives the Conclusion and

Recommendations References



Glossary

Annexures



Chapter# 2

DESCRIPTION OF PROJECT

Type and category of project:

The subject project Intends to installation of incinerator under the name of M/S Geo Links Pvt. ltd over an area of 1 Acre. The capacity of the incinerator to incinerate solid waste is 1000 KG/Hr. Aim of this project is to provide incineration facility for industrial solid waste disposal. The subject project cost is 50 million.

According to the Punjab Environmental Protection Act 1997 (Amended 2012) and its interpretation as per Review of IEE & EIA Regulations, 2000 for filling, review and approval of environmental assessments, the present project is categorized in the category G-1 of Schedule-II for EIA, of PEPA, Regulations, 2000, requiring Environmental Impact Assessment (EIA). Further, the client is required to fulfill the legal requirements of the Section-12 of the Punjab Environment Protection Act 1997(Amended 2012).

Objectives of the Project:

Under this project Geo Links Pvt. ltd has plan to install an incinerator. An Environmental Impact assessment report is being submitted to Environmental Protection Agency for the issuance of NOC for subject project.

Present Project has following objectives;

- **Provide a facility for disposal of hazardous waste**
- Reduce the scale of processes so that less waste is generated.
- Proper handling and storage of industrial waste
- It is expected to benefit local industries in the subject area.
- To provide job opportunities to local public
- To improve the economic activities
- To provide better infrastructure
- Private investment will be beneficial for the national economy and GDP as well
- Project will function in a sustainable way for disposal of solid waste



Alternative consideration and reason for their rejection:

Location Selected:

The proposed site is in the vicinity of Geo Links Pvt. Ltd and Geo Links Pvt. Ltd has wanted to install the Incinerator unit is Ghang Road, Machike, Mahaal Jamber Tehsil & District Sheikhpura. GPS coordinates of selected site are 31°42'56.98"N, 73°54'11.95"E. A Google map showing the location of this selected site is as follow.





Reason of selecting existing site:

The reasons of selection of this site are:

- Availability of access roads
- Compatible land use
- Sufficient distance from major population centers
- Communication facilities
- Willing land host communities
- Availability of electricity
- Basic infrastructure
- Limited sensitive ecological issues;
- Less/few vegetation/plantation
- Less fauna species at site
- Convenient plot layout

Keeping these requirements and their feasibility and other basic infrastructural requirements at the site, the selected site is ideally suited for Installation of Incinerator facility.



Project Alternative:

Alternative sites were identified initially for the project. This site was located near Mahaal Jamber, Sheikhupura. The present site has been selected after consideration of the other alternative site.

Location and site layout of the project:

The proposed incinerator site is located Ghang Road, Machike, Mahaal Jamber Tehsil & District Sheikhupura.

Project land coordinates are as follows:

Front:	Agricultural land
Back:	Agricultural Land
Right:	Agricultural Land
Left:	Building





Figure 4: Pictorial view of access road

Vegetation features of the site:

The project site has few and scattered amount of vegetation that will help to avoid land clearing, mainly shrubs, weeds and grasses are present over there in scattered quantity. The land is clear and free of dense vegetation.



Magnitude of the operation including capital cost, and associated activities

This project is of installation of incinerator and presently is open land. Project related activities will be start after the environmental approval from EPD. Total land area for the development is 1 Acre. The total cost of the subject project is about 50 million rupees while operational cost of the project with respect to environmental management will be the periodically replacement/filling of safety devices. A complete layout map of the area is annexed (**Annexure-C**).



Schedule of Implementation:

The project will be completed within 4-5 month approximately after the issuance of approvals from all concerned departments.

Description of the project:

Installation of incineration plant under the name of M/S Geo Links Pvt. Ltd will be located Ghang Road, Machike, Mahaal Jamber Tehsil & District Sheikhpura. Detailed description of this proposed project is as follow.



beds)	
Burning Ability	1000 kg/time (daily incineration 3-6 times)
Size of the incinerator	1.8m×1.4m×3.4m
Volume of incinerator	Gasification room1.2m ³ ,secondary burning room 0.6m ³ ,mixing burning room0.06m ³
Size of the filling entrance	520 mm×720 mm
Chimney	Height 10m, out-radius Ø300 mm
Air blower	0.5kw
Auxiliary burner	Power 0.11kw, oil consumption volume 4-10kg/h
Re-burning burner	power 0.22kw,oil consumption volume 7-14 kg/h
operation voltage	220V or380V
weight	About 6000kg

AUSW-100 Main configuration list

Equipments name	specification	qty	unit
Furnace main body (first burning room)	A3 steel、refractory material	1	set
Auxiliary burner	power 0.11kw	1	set
Re-burning burner	Power 0.22kw	1	set
secondary burning room	A3 steel、refractory material	1	set
Mixing burning room	A3 steel、resist high temperature material	1	set
gas	Main parameters		set

Applicable hospital size (number of beds)	150-200 beds
Burning Ability	1000 kg/time (daily incineration 3-6 times)
Size of the incinerator	1.8m×1.4m×3.4m
Volume of incinerator	Gasification room1.2m ³ ,secondary burning room 0.6m ³ ,mixing burning room0.06m ³
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Mixing burning room	A3 steel、resist high temperature material	1	set
gas fume purify room	A3 steel、resist high temperature material	1	set



oil storage tank	steel plate	1	pc
air blower	0.5 kw	1	set
ventilate pipe	A3 steel pipe	1	set
chimney	A3 iron pipe, out-radius $\varnothing$ 300mm height 10m	1	set
thermoelectric couple	Resist high temperature 1200°C	1	set
Electronic control system		1	set
installation attachment		1	set
Installation manual and video disk		1	set

Burning technical qualification					
	Burner's	Smoke's	Burning	Destroying	Ashes'heat
Refuse type	Temperature	Stay time	rate	rate	Decreasing rate
Clinical refuse					
	$\geq 850^{\circ}$	≥ 2.0 S	$\geq 99.9\%$	$\geq 99.99\%$	$\geq 95\%$
Flue & Gas emission standard					
Ordinal number	Refuse name	Measuring unit	GB18484-2001		
1	Blackness of flue gas	Ringelman class	I		
2	Smoke & dust	mg/m ³	100		
3	CO	mg/m ³	100		
4	SO ₂	mg/m ³	400		
5	HF	mg/m ³	9		
6	NO ₂	mg/m ³	500		

Type of Solid Waste for incineration and Reduction

All type of industrial waste including hospital waste, clinics will be incinerated in the proposed incineration plant. Incineration is a high-temperature dry oxidation process that reduces organic and combustible waste to inorganic, incombustible matter and results in a very, significant reduction of waste volume and weight. Solid waste after incineration will reduce up to 75%, on each 5 KG solid waste, 1.25 KG Ash will be generated. This process is usually selected to treat wastes that cannot be recycled, reused, or disposed of in a landfill site

Design & Construction of Incinerator

The objective of project is to install an incinerator to promote cleaner practices and complete combustion of industrial wastes with a view to waste volume reduction and amelioration. Incinerations can minimize industrial waste at the same time minimizing impact on the environment.



1- Incinerator Capacity

Incinerator of 6000 Kg/batch capacity will be installed. It consists of three chambers, which are interconnected. The primary chamber is for burning solid and liquid waste. The secondary chamber is for burning Hydrocarbons carried over from the primary chamber. The third chamber is for settling the ash and cooling of flue gases. The three chambers are constructed on steel structure with 45% Alumina Refractory bricks lining

2- Waste Feed and De-Ashing System

The feed system of incinerator would be manual (batch); the waste is typically batch-fed into a charging hopper. Residue generated after combustion will remove manually. Ash removal and cleaning is conducted through Ash doors. The doors are steel fabricated with firebrick lining from inner side.

3- Controls

The burner has provision for pre-purge, automatic sequencing, automatic ignition and flame supervision. Temperature Controller is provided to automatically maintain the temperature of the secondary chamber. In case temperature in secondary chamber rises or falls down beyond safe limit both primary and secondary burners will shut down and alarm will sound. Temperature Controller is provided in the primary chamber to cut off the burner at set temperature for fuel saving. A temperature gauge monitors the fuel temperature

4- Dust Collection

The cyclone dust collector made with S.S. casing has been provided to collect larger dust particles and Bag filters to collect fine particles to convey exhaust gases through chimney.

5- Fan

Induced Draft Fan made with S.S. impeller and SS. casing has been provided to convey exhaust gases through chimney.

6- Chimney

The chimney is 25 feet high with 3" thick brick lining up to eight feet height conveys the flue gases to the atmosphere. SS Ducts have been provided to connect incinerator with dust collector and further to connect dust collector to I.D. Fan and then to chimney



7- Incineration Principle

Most modern large incinerators operate on the _starved air principle, in which the waste is gasified and partially burnt using a support fuel (e.g. gas or fuel oil), in primary chamber. Gaseous phase reactions are completed in a secondary chamber and the remnant solids are then burned as completely as possible in an air rich zone, or a tertiary chamber, at the discharge end of the incinerator. The gases and airborne particulates are then subjected to complex (and often expensive) _clean up‘ before being emitted to atmosphere. For this hazardous waste incinerator, the focus of this project is to achieve optimal emissions without the USC of sophisticated gas cleaning equipment, if costs are to be kept to a reasonable level.

Given careful design, construction and operation. However, it should be possible to achieve acceptable levels of emissions without the need for gas cleaning, by using the starved air principle. A significant proportion of industrial waste has valued as fuel, but the waste composition could be such that it might become often very difficult to achieve complete combustion using this alone. Therefore the incinerator is designed to operate using a support fuel such as Natural Gas. The selection of a support fuel depends on its availability and the implications on operating costs



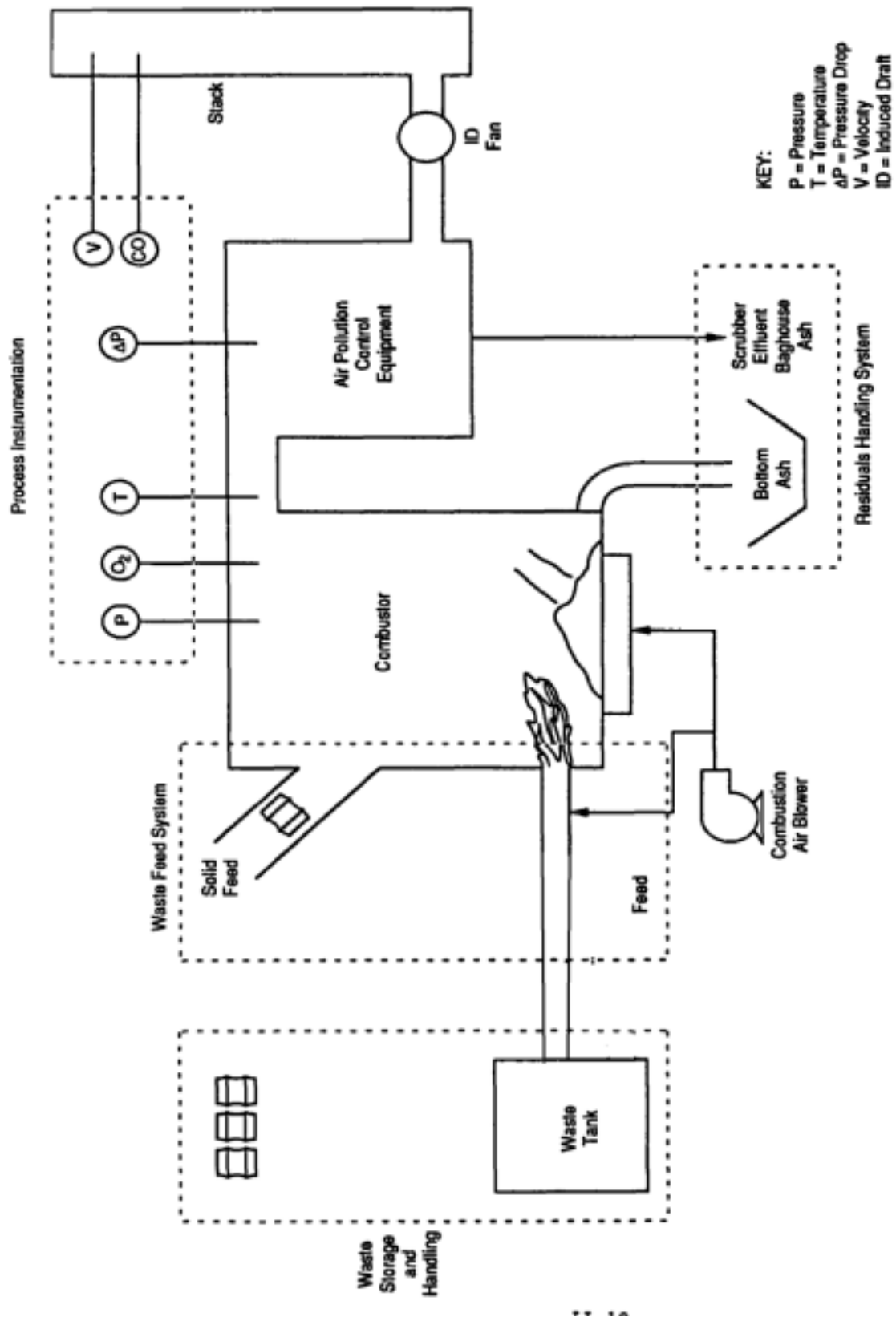


Figure: Components of Incinerator

8- Characteristics of Waste Suitable for Incineration

- Content of combustible matter above 60%
- Content of non-combustible solid below 5%
- Content of non-combustible fines below 20%

9- Waste Types not to be incinerated

The proposed Incinerator is designed to incinerate industrial waste at the rate of 1000 kg/hr. Incineration of materials unsuitable for incineration can result in the release of pollutants into the air. Occupational risks may be associated with the operation of certain disposal facilities.

- ✚ Pressurized gas containers
 - ✚ Large amounts of reactive chemical waste
 - ✚ Silver salts and photographic or radiographic wastes.
 - ✚ Halogenated plastics such as polyvinyl chloride (PVC)
 - ✚ The incineration of materials containing chlorine can generate dioxins and furans, which are classified as possible human carcinogens and have been associated with a range of adverse effects
 - ✚ Waste with high mercury or cadmium content, such as broken thermometers, used batteries and lead-lined wooden panels
 - ✚ Sealed ampoules or ampoules containing heavy metals. Incineration of heavy metals or materials with high metal contents (in particular lead, mercury and cadmium) can lead to the spread of heavy metals in the environment
 - ✚ Dioxins, furans and metals are persistent and accumulate in the environment.
- Materials containing chlorine or metal should therefore not be incinerated

10- Factors affecting Design of Incinerator

Incineration of waste is an operation that includes feeding the furnace, burning the waste, exhausting the gases to the atmosphere, and removing the residue from the furnace. Factors, which directly influence the detailed design of the incinerator, include:

- Combustion temperatures, combustion gas residence time.
- Capital, operational and maintenance costs • Current and future quantities of waste • The waste composition and its calorific value
- The infrastructure of the area chosen for the field trials (roads, electrical power)



- Attitudes and legislation relating to emissions control
- Public concerns about incineration
- The degree to which an integrated waste management strategy has been prepared and the incinerator's role within it
- Locally available materials (refractory bricks or other insulation materials)
- Locally available manufacturing skills

11- Incinerator Operators

Incinerator operators should be trained for smooth operation of incinerator. They should be specifically trained regarding the following subjects:

- Functioning of the incinerator facility
- Health, safety and environment implications of their operations.
- Technical procedure for operation of incinerator
- The conditions which operator has to face at the site are:
 - Incinerator working at a high heat, which put the operators at a risk of burning,
 - The heat may lead to fire, carbon monoxide poisoning, etc
 - During burning refuse may yield substances that may be hazardous or even poisonous.
 - The Operators job is physically hard and may lead to pain and other problem in hands, arms, lower back and other body parts.
 - Operators work in a noisy, hot and humid environment that may cause tiredness and general ill feeling.

Emission of Gases

Furans and Dioxins

The biggest most concern, which has caught thoughts of environmentalists about solid waste incineration, is production of a huge amount of furans and dioxins. These are considered staidly injurious to health. Modern generators are equipped with special equipment to clean emission of gases from these injurious components. There was a time when no governmental regulation were there to bound incineration and save environment and atmosphere from this



hazardous emission of gases but today there are strict and rigid rules and regulations to follow and conduct incineration.

Carbon dioxide

Incineration while being conducted produces a vast amount of Carbon dioxide. Carbon dioxide plays a due role in global warming, as this is the greenhouse gas. It has been observed that almost everything which has carbon in its composition is when processed by incineration evolves out as carbon dioxide.

Extra Emissions

Some other emissions of gases by waste processing are sulfur dioxide, hydrochloric acid, fine particles and heavy metals.

Solidify Outputs

Flue ash and Bottom ash is produced with the processing of waste materials and settle at the bottom of the incineration plant. The ash, which is produced, is twenty to twenty five percent of total weight of the waste processed while the flue ash makes up some ten to twenty percent of total weight of waste material. The heavy metals, which are contained in the flue or bottom ash, are lead, cadmium, zinc and copper. A small amount of furans and dioxins are also produced. It is to mention here that bottom ash seldom have heavy metals in it. Flue ash is hazardous while bottom ash is not that dangerous or injurious to health.

Other issues related to Pollution:

Older models of incinerators have inconvenience that this produce odor pollution. However, in modern plants are saved from producing dust and odor pollution. They are designed to store waste in enclosed containers along with a negative pressure to keep from odor and dirt dispersal.

Arguments supporting incinerations

- The first concern for incineration stands against its injurious effects over health due to production of furans and dioxin emission. However, the emission is controlled to greater extent by developing of modern plants and governmental regulations.
- The bottom ash after the process is completed is considered non-injurious that still is capable for being land filled and recycled.
- Fine particles are removable by processing through filters.
- Treating and processing medical and sewage waste produces non-injurious ash as product.



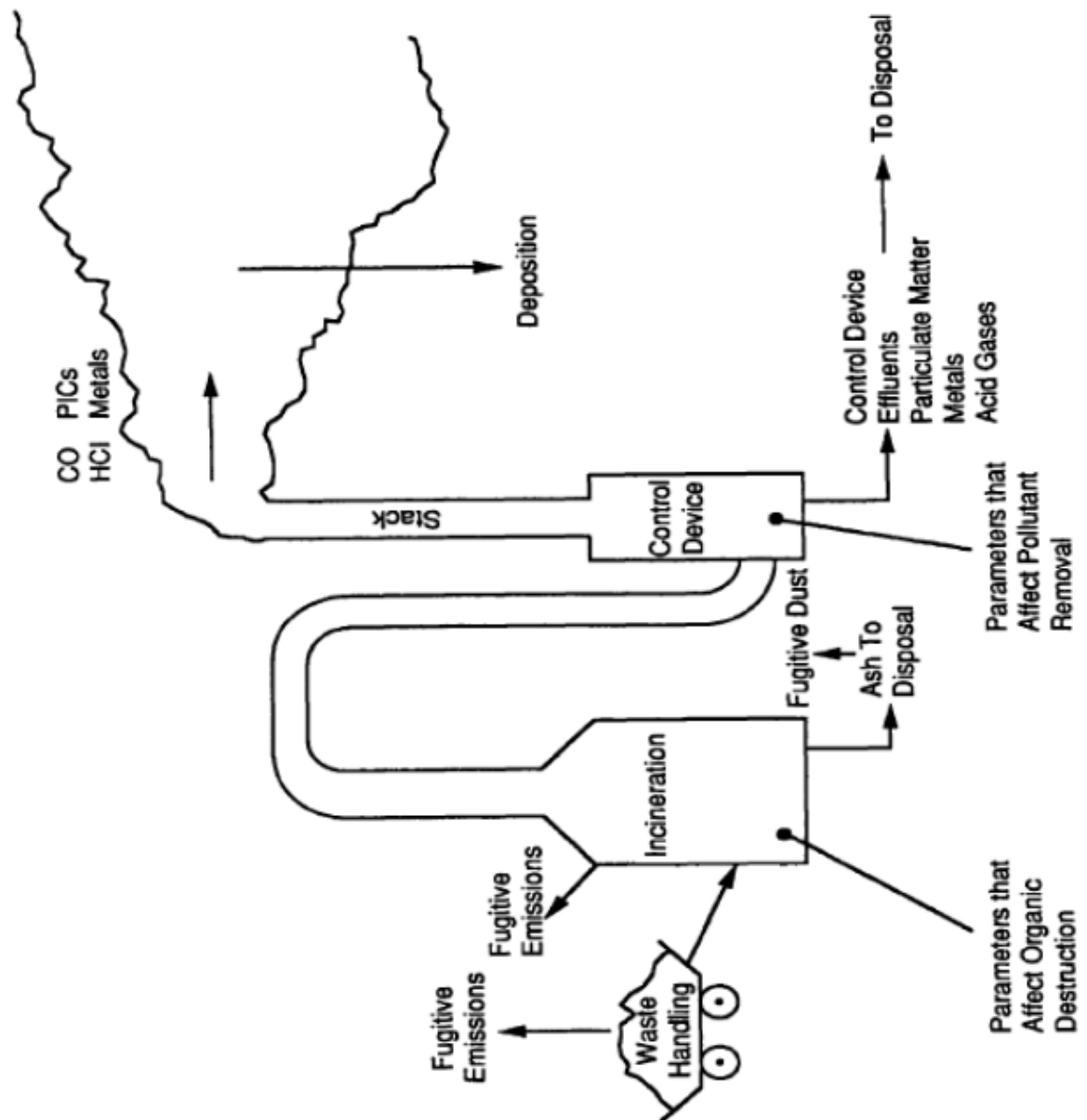


Figure II-1. Combustor environmental releases.

II-6

Figure: Combustor Environmental Releases

12- Safety Precautions

Every stakeholder should follow the following safety instructions:

- Read & Comply with all safety instructions.
- ☐ Never enter incinerator or loader when power is —onll or incinerator is hot.
- ☐ Always remove power (LOCK-Out/Tag out) during the maintenance.
- Make sure all guards and safety devices are in place secured and in proper operating condition before starting equipment.
- At initial burner start up make sure incinerator doors are closed and lacted.
- Keep all areas around incinerator and loader clean to reduce the fire hazards for easy operator movement.
- Do not wear loose clothing around operating equipment.
- ☐ Do not incinerate explosives or highly violate materials.
- ☐ Do not overload equipment
- When opening the incinerator charging door during operation stand behind the door. A full face shield is recommended
- Do not open ash removal door during the operation. Wait until ash hs cooled to comfortable temperature
- Do not remove the cap from spark igniters without first shutting off power. Spark igniters can arc and cause electrical shock and possible severe injury.

The jobs and tasks of the operator would be:

- Activating/firing (burners)
- Adjusting air (Primary air requirement with louvers)
- Cleaning/removing (ash, debris)/ shoveling/sweeping.
- Detecting (malfunctions).
- Feeding (waste).
- Loading and unloading (waste).
- Maintaining (equipment).
- Measuring/monitoring/observing/ recording.
- Opening and closing (Incinerator doors).
- Regulating (flow, temperature).
- Turning on/off



- Design Criteria for Development

13- Staffing and Supplies

Local people will be hired for construction and operation phase of the Incinerator. It is expected that approximately 10-12 people will be required during construction phase and 2-3 people during operation phase of the incinerator. During operational phase, waste will be collected from industries through local contractors. The supplies will be transported to the project site in pickups/trucks. General supplies to be transported will include the construction material and equipment. Project personnel will travel to and from the site in smaller vehicles, mostly four wheel drive pickups. Water during construction and operation phase will be transported to the project facilities from ground water supplies. A maximum of 1000 liters of water will be required per week during the construction phase. During operational phase the waste to be incinerated will be collected by vehicles owned by the Incinerator Facility proponent.

Advantages of Incinerator

Consequently, whilst recycling has an important part to play, incineration frequently forms part of an overall strategy for the management of waste. Landfill will always be required for the residue, which typically amounts to about one-third of the initial mass of waste. Incineration of wastes offers the following advantages.

Volume reduction, especially for bulky solids with a high combustible content, toxic organic compounds, or biologically active materials Socio-environmental compliance, especially for fumes containing odorous compounds, carbon monoxide or other combustible materials subject to regulatory emission limitations Environmental impact mitigation, especially for organic materials that would leach from landfills or create odor nuisance Reducing atmospheric pollution caused by smoke emitted during combustion

Consumption of Water

Water consumption for the subject project will be approximately 1000 gallons/day during construction activities and 50-100 gallons/day during operational phase will be used. This consumption of water will be fulfilled by underground water having depth of about 700 ft.



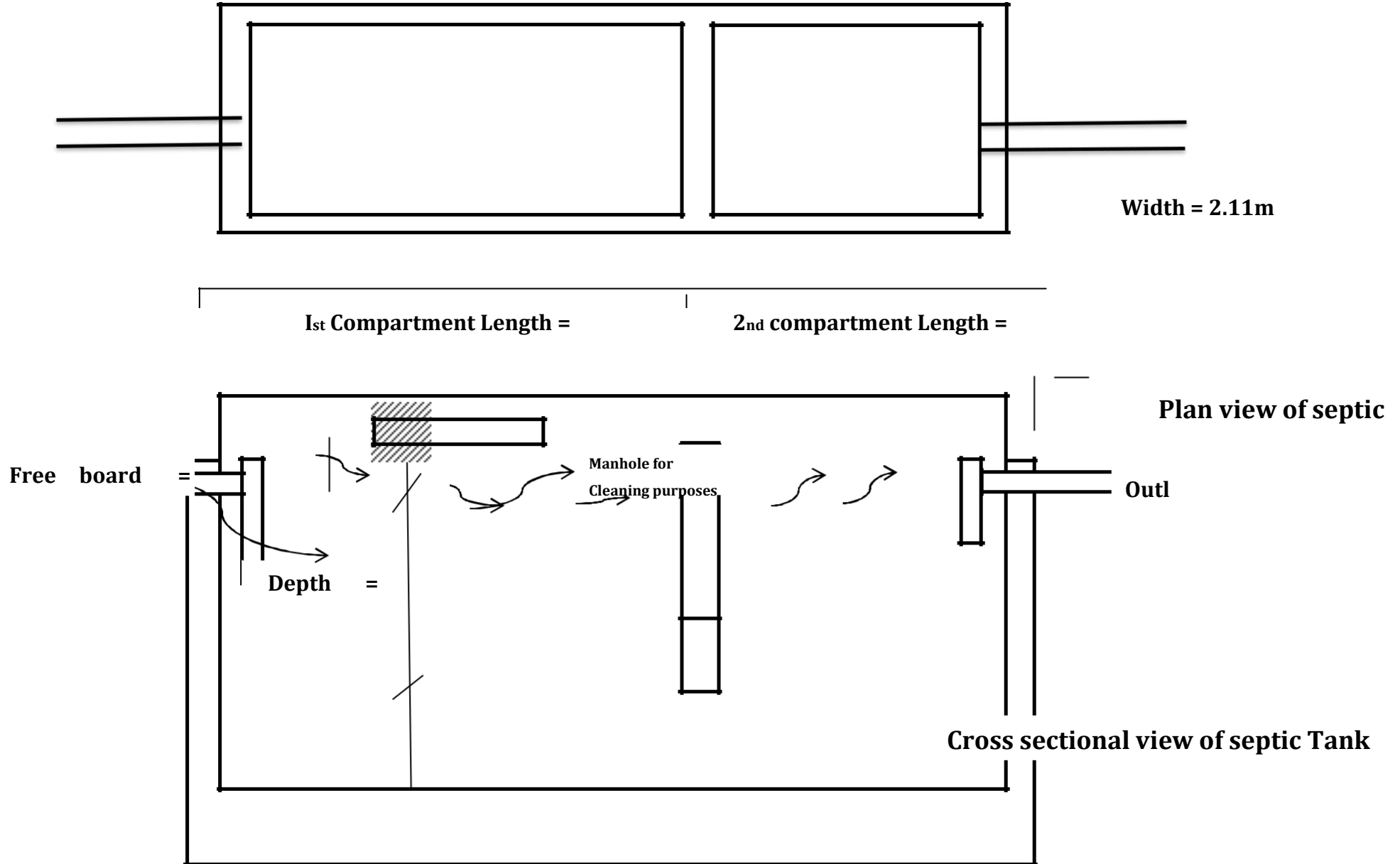
Waste water production will be 70-80% of the total used water that will be collected in waste water collection tank and after treatment in septic tanks, it will be discharged into nearby local farmers drain. There will be no hazardous chemical or pollutant release from the subject project during and after construction phase. Only domestic water will be drained out after treatment in septic tanks.

Waste Products of Project Process

Wastewater:

Total waste water of the project will be about 70% of the total used water which will be municipal/domestic waste water during the construction. The water discharge from the proposed power plant can also be categorized as, sanitary wastewater and storm water. There is no process water in the proposed project. Wastewater channel is present near the said unit. Domestic wastewater after treatment in septic tank will be discharged into nearby Industrial drain. The design of one septic tank is given in below table, all the tanks will be designed by following specifications. The tank will be properly inspected and cleaned otherwise accumulated sludge and scum cause the failure of tank function.





Cleaning Out Atmospheric Emissions:

Emission gases from an incinerator may involve Dioxins, Furans, carbon dioxide, sulfur dioxide, hydrochloric acid, fine particles and heavy metals. A number of processes are involved for the cleaning up of flue gas. In the proposed incinerator project, mixture of flue gas will be collected by means of Particle filtration and this filtration will be conducted through cyclone for larger dust particles collection and 8-10 bag house filters for capturing fine particles. Bag house are very effective for fine particles. Bag Filters will be installed in incinerator for flue gases cleaning.

Solid Waste Management & Ash Disposal

Solid waste will consist of all type of solid waste including Medical waste, Industrial unit waste and some general waste of Municipal nature.

1- Solid waste collection and transport:

Compactor vehicles will use for waste collection. Proper schedule and route will be developed and allocated for solid waste collection vehicles for collection the waste and transfer to the storage facility of plant. Vehicle will transfer the waste to storage facility with proper covering.

2- Schedule for solid waste collection

The waste will be collected on daily basis from specified points and waste containers will transfer the waste to the storage area.

3- Storage of solid waste

After collection of solid waste, it will be store in ware houses of proposed project area, having impermeable flooring, to avoid leaching of contaminant into soil. By trained workers, solid waste will feed into chambers of incinerator.

4- Ash collection & Disposal

After feeding solid waste into combustors of incinerator, bottom ash will generated along with ash from cyclone and bag filters. This ash will be collected by taking appropriate measure, and transfer to landfill site.



5- Awareness plan

All sanitary workers should undergo extensive training in SWM, including the linkage between a deteriorating environment, waste, and human health, the treatment and management of waste, occupational hazards, health and hygiene, collection and transportation procedures, and etc.

Noise

Noise generation from the project during construction phase will be due to the construction machinery, vehicles and by the sound of generator which will be controlled by adopting proper noise abating technologies. During operation phase noise will be control by constructing sound proof room for generator and providing PPEs to workers during any noise work environment.

Available Facilities:

Available facilities in the project area are given below:

- Electric supply.
- Line and cellular telephone facilities.
- Labor force available for constructional and operational phase.
- Road

Health, Safety & Hygiene

Health, Safety & Hygiene includes the following:

First Aid facility

At workplace workers and employers should have enough information, knowledge and training regarding first aid treatment in case of any emergency. The subject project will provide proper medical facilities to workers and staff to cope with any incidental accidents and proper training about first aid will be provided to workers and staff.

During the construction and operation phase health, safety and environmental measures will be ensured. The health and safety plan is attached as **Annexure-D**.

Safety Trainings:

HSE personals will conduct monthly HSE training and drills for the emergency situation preparedness. Labors and all the staff will be provided with proper training about the work and safety practices.



Personal Protective Equipment's (PPEs):

Proper PPEs will be provided to the workers and other staff.

Types of PPEs used during construction and Operational activities

Protection	Occupational Hazards	PPEs
Head Protection	Falling objects, inadequate height clearance, and overhead power cords	Helmets with or without electrical protection
Hand protection	Hazardous material, cuts or lacerations, vibrations, extreme temperatures	Synthetic or Rubber gloves, leather, insulating material etc
Eye and Face Protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation	Glasses, shield protective, etc
Hearing protection	Noise, ultra sound	Hearing protectors like ear plugs, ear muffs
Respiratory protection	Dust, fogs, fumes, gases, smokes, vapors, oxygen deficiency	Facemasks or air supply
Body protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Aprons, insulating clothing etc of appropriate materials

Restoration & Rehabilitation Plan:

The proposed site for incinerator is located Ghang Road, Machike, Mahaal Jamber Tehsil & District Sheikhpura. It is un-populated area with no any human settlement at more than 4-7 kilometers distance and also there is no chance of human population displacement to acquire the land. The site of the proposed project seems to have no visual impact on historical, archeological, and cultural resources and on landscapes, as the site does not fall near or in the boundaries of the protected areas. The project area is uninhabited. Hence resettlement and rehabilitation requirements are nonexistent

Plantation:

There is very low vegetation in project area. Native plants will be planted by the proponent for the aesthetic beauty and conservation of the plants. Proposed Tree Plantation Plan is attached as **Annexure-E** of the report.

Government approvals:

The project proponent will get all relevant approvals from the government departments after getting Environmental approval.



Chapter # 3

DESCRIPTION OF ENVIRONMENT

Physical Environment:

Topography & Geography

The proposed site is situated Ghang Road, Machike, Mahaal Jamber Tehsil & District Sheikhpura. Site area is generally flat and slopes towards south and south-west at an average gradient of 1:3000. The project area is surrounded by industrial units and agricultural lands.

Soil

The selected project land is w.r.t fertility is poor fertile land. In the vicinity, the fertile agricultural land can be seen. The soil of surrounded area is loamy in nature.

Climate

Temperature & Precipitation

Temperature & precipitation pattern can be estimated from the below figure simulated on the base of 30 year of hourly weather data collected from Pakistan Metrological Department (PMD). The 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. Climatic changes are being significant factor to change the expected temperature & precipitation pattern in the proposed project area of Dist. Sheikhpura.

The given below Figure shows the precipitation diagram for Dist. Sheikhpura on how many days per month, certain precipitation amount is reached. The proposed project area has maximum rainfall in July & August and dry season from October to December. In tropical and monsoon climate, the amounts may be underestimated.



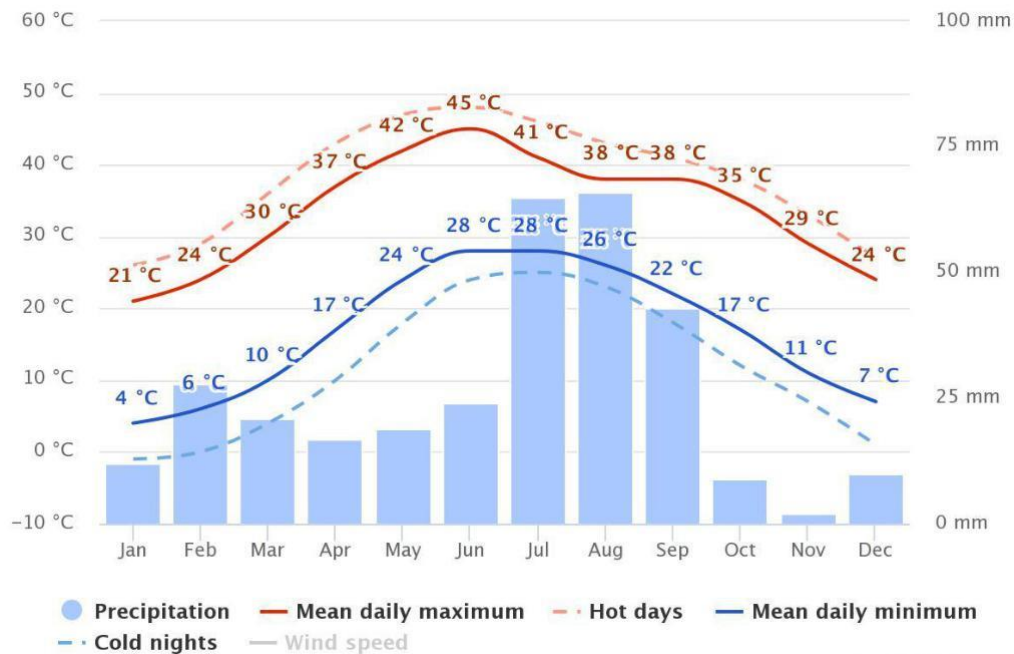


Figure 1 Average Temperature & Precipitation for proposed study area in Dist. Sheikhpura



Figure 2 Amount of Precipitation for proposed study area in Dist. Sheikhpura.

Wind Speed & Direction

Wind speed and its direction can be estimated from the figure given below. The data is simulated on base of 30 years' hourly weather condition data collected by Pakistan Metrological Department (PMD). Mostly, greater than 5 Km/h winds below in area of proposed project site and its direction toward East – North East side. Greater than 12 Km/h wind below mostly towards East – South East direction.

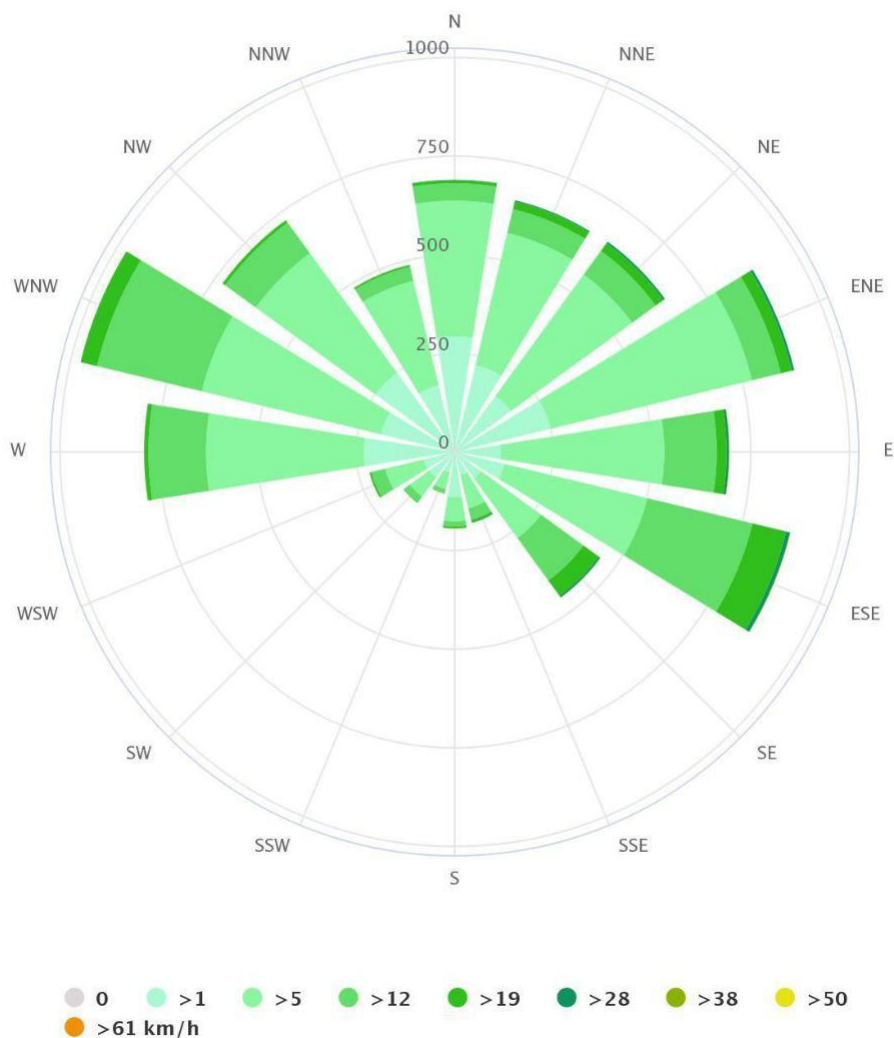


Figure 3 Wind Roses of proposed project site in Dist. Sheikhpura

Hydrology

Surface Water

No clear water canal, stream or river is passing within 10 – 15 Km range of proposed project site.

A wastewater receiving Nalah is passing on through side of proposed project site.

It receives wastewater from all nearby industries.

Underground Water

Underground water resource use nearby project area industries and houses. The underground water is clear, healthy and can be used as drinking purpose also. Pumps, tube wells and hand pumps are used to extract the water from ground. Water table is present at the depth of 70 feet but is not fit for drinking purpose due to contamination. Drinking water can be extracted from the depth of 600- 800 ft from ground. Water Quality test report are given in **Annexure-F**.

Table 1: Lab report of Drinking Water Quality

Sr. No.	Parameters	Unit	WHO	PEQS
1	PH	-	-	6.5-8.5
2	Electrical Conductivity	μS/m	-	-
3	TDS	mg/L	1000	<1000
4	Turbidity	NTU	5	5
5	Taste	-	-	Non-Objectionable
6	Odor	-	-	Non-Objectionable
7	Total Hardness	mg/L	-	<500
8	Sulphate	mg/L	250	-
9	Sodium	mg/L	200	-
10	Chloride (Cl ⁻¹)	mg/L	250	<250

Discussion

The underground water is not fit for drinking purpose at the depth of 70ft. Water quality investigation is recommended at different depth for the safe drinking water.

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

Annexure-F.

Table 2 Lab results of Ambient Air Quality

Sr. No.	Parameter	Unit	PEQS
1	PM ₁₀	($\mu\text{g}/\text{m}^3$)	150
2	CO	(mg/m^3)	10
3	NO ₂	($\mu\text{g}/\text{m}^3$)	80
4	NO	($\mu\text{g}/\text{m}^3$)	40
5	SO ₂	($\mu\text{g}/\text{m}^3$)	120

Discussion

Ambient air quality is satisfactory. Air pollution abatement technologies are strongly recommended in the proposed project.

Noise

Basic Environmental conditions:

During the measurement following conditions were prevailed on workplace

Metrological Conditions:

During the noise level monitoring weather was dry and sky was clear. Air was blowing at normal speed

Monitoring Instrument:

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



Figure 4 Noise meter

- Name: Digital sound level meter
- Model: AR824
- Company: Intel Instruments plus
- Calibration: Self-calibration time: 10 sec (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
 - v. Sampling Frequency: 2/sec

Sources of Noise Pollution:

Major sources of noise generation are industrial unit and vehicular traffic along the main road. Noise levels were monitored at proposed project site. The noise levels are falling in the range of 43.8-50.1 dB (A).

Table 3 Results of noise Monitoring

Sr. No.	Locations	Average Noise dB (A)
1	East Side	49.6
2	West Side	43.8
3	North Side	50.1
4	South Side	44.5
PEQS (Day time Industrial Area)		75 dB(A)

Discussion

The noise level of the proposed site is within permissible limits. Ear plugs for worker will be provided during operation phase of proposed project.

Ecological Environment:

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.

Flora

The proposed project site has very low vegetation cover. A little grasses and Shrubs are present.

Fauna:

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

Table 4 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	

3	<u>Canis lupus</u>	Dog	
4	Passer domesticus	House Sparrow	
7	Thanasimus formicarius	Beetle ant	

8	Sympetrum flaveolum	Dragon fly	
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Rare or endangered species:

There are no game reserves or protected lands/areas or endangered or rare species either in the area in the range of 5km from the project site.

Socioeconomic Environment:

Education:

On the proposed project sit there is no school in vicinity of site, as nature of site is not residential. Sheikhpura is Pakistan's largest producer of professionals in the fields of science, technology, IT, engineering, medicine, nuclear sciences, pharmacology, telecommunication, biotechnology and microelectronics. Most of the reputable universities are public, but in recent years there has also been an upsurge in the number of private universities. The current literacy rate of Sheikhpura is 74%.

Culture:

Sheikhpura is referred to as the cultural heart of Pakistan as it hosts most of the arts, cuisine, festivals, music, film-making, gardening and intelligentsia of the country. The city has always been a centre for publications where 80 percent of Pakistan's books are published, and it remains the foremost center of literary, educational and cultural activity in Pakistan. It is also an important religious center as it is home to hundreds of temples, mosques, churches and Hiran Minar.

Project proponent is committed to preserve the culture and norms of the area and will provide employment to local people for the preservation of the culture.



Recreational Resources and Development:

The project area has not any private recreational facilities.

Quality of life values:

People lead simple life and activities of women are mostly restricted to home. Beside this people have access of all basic life necessities like clean drinking water, electricity, health facilities and educational institutes. Most of the people work in industry beside this local people also involved in business activities like they have their own shops hotels and other commercial activities.

Like the general trend among the citizens of area, most of the people have low awareness about environment. Even then, some people take cleanliness and neatness of the environment lightly. Some people throw municipal solid wastes (MSWs) on the streets. Sense of personal responsibility to keep the environment clean as good citizens is even now lacking among a few people.



Chapter # 4

POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

The following chapter describes the overall possible impacts of project on the physical, biological and socioeconomic environment because of construction and operation phases and mitigation measures to minimize the significance of the possible impacts up to an acceptable level.

Methodology of Impact Evaluation:

The methodology adopted for impact evaluation includes the Project Impact Evaluation Matrix.

Project Impacts evaluation Matrix:

The impact Evaluation matrix was developed by placing project activities on x-axis and different environmental parameters likely to be affected by the proposed project actions grouped into categories i.e. Physical, Biological and Socio Economic Environment. For the impact assessment, project impact assessment matrix is used for the construction and operation phase. A project impact evaluation matrix is attached in next section of this chapter.

Checklist has been used to identify the impacts during construction and operation phase while the evaluation of impacts has been carried out on the basis of developing matrix, in which impacts have been rated on the basis of their significance. For rating impacts significance following criterion has been developed;

NA – Not Available

LA – Low Adverse (Short term, reversible or less damage to environment)

MA- Medium Adverse (Long term reversible damage to environment)

HA – High Adverse (severe irreversible adverse damage to the environment)

LB – Low Beneficial (Short term benefits or less beneficial to the environment)

MB – Medium Beneficial (Long term benefits to environment)

HB – High Beneficial (Continuous benefits to environment)



ENVIRONMENTAL IMPACT ASSESSMENT REPORT
Of M/s Geo Links Pvt. Ltd, Sheikhpura

Physical Environment								Biological Environment		Socio-Economic Environment								
Environmental Component	Drainage	Soil Quality	Landscape	Water Quality	Water Quality	Air Quality	Noise	Flora	Fauna	Land Use & Health	Safety	Disruption of Public Utilities	Population	Disturbance	Social	Disorder Cultural	Values	Management
Project Activities																		
Transportation Activities	LA	LA	LA	MA	O	MA	MA	LA	MA	O	LA	LA	HB	MA	LA	LA	LA	
Earth Work	LA	LA	MA	LA	LA	MA	MA	LA	LA	O	HA	HA	HB	LA	O	O	LA	
Construction Activities	LA	LA	MA	LA	LA	MA	MA	LA	LA	O	HA	HA	B	LA	O	O	LA	
Operation of generators	O	O	O	O	LA	HA	MA	O	O	O	HA	LA	HB	O	O	O	O	
Operation Phase	O	O	O	O	O	O	MA	O	O	O	LA	O	HB	LA	O	O	O	
Water consumption	LA	O	LA	MA	MA	O	O	LA	LA	LA	LA	HA	B	LA	O	O	O	
Wastewater generation	MA	LA	MA	MA	MA	MA	O	MA	MA	MA	LA	LA	B	LA	LA	O	O	
Storage of Waste materials	LA	LA	O	LA	MA	LA	O	O	O	LA	HA	LA	B	O	O	O	LA	
Public welfare	O	O	B	B	B	B	O	B	B	HB	HB	HB	H	HB	HB	HB	LB	



ENVIRONMENTAL IMPACT ASSESSMENT REPORT
Of M/s Geo Links Pvt. Ltd, Sheikhpura

													B				
Economic activities	LB	O	B	B	B	B	B	B	B	B	HB	B	B	B	B	B	LB
Employment	O	O	O	O	O	O	O	O	O	O	B	B	H B	B	B	B	LB
Infrastructure Improvement	LB	M B	HB	B	B	B	B	HB	LB	HB	HB	B	H B	B	B	B	B

Legend:

O=Negligible/No impacts

B=Beneficial

LA=Low Adverse

MA=Medium Adverse

HA=High The following chapter describes the overall possible impacts of project on the physical, biological and socioeconomic environment because of operation phases and mitigation measures to minimize the significance of the possible impacts up to an acceptable level. The anticipated impacts related to location, design, construction and operation of the proposed project have been assessed and mitigation measures have been suggested in this report.



Mitigation measures to reduce the impacts on geology, topography, water resources and soil are as follow:

Impacts Analysis and prediction:

In order to give correct categorization to the present project Rapid Environmental Assessment Procedure was followed. It revealed that there are no major adverse impacts of the project although it has many positive impacts on local public and economy. Only a few and moderate/minor impacts are projected.

Screening:

It is the first step of the environmental study. It identifies the factors that may influence the project environments. Level of the assessment is also determined.

Characterization:

Categorization of the project is done as per Pak EPA, Review of IEE and EIA Regulations, 2000. Accordingly the project falls in Schedule-II for which an EIA level study is needed.

Meetings:

For the impact analysis and predictions detailed meetings were held with local government officials, management of Geo Links Pvt. Ltd Pakistan and Local peoples. Issues were discussed that may affect the environment at any stage. All possible mitigation measures were considered and incorporated in the Environmental Management Plan.

Consultation

Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders, shopkeepers and workers in the area. These included local government departments, NGOs, public representatives and local residents.

Concerns of stakeholder:

During these discussions the participants gave their candid views about the environmental issues and their potential impacts. There was unanimous positive view about the project. However, they opinioned that mitigating measures can be minimized the environmental degradation and ward off an untoward incident/accident. Some of their main concerns are given below:

- The locals should be consulted during every phase of the project.
- Maximum employment should be provided to local area/



- Health facilities would be provided to the workers of the project.
- The project would not cause environmental degradation in any shape
- Workers would have job security during operational phase.

Mitigation and Impact Assessment Criteria:

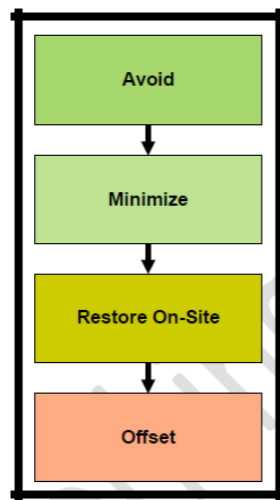
Impact assessment criteria:

The impacts were assessed in the light of criteria given as under:-

- Magnitude or degree of impact
- Time and duration of impact
- Likelihood of impact occurrence
- Sensitivity of impact
- Risk related to impact

Mitigation assessment criteria:

The Mitigation Hierarchy establishes a structure to guide development and application of measures to mitigate impacts on environmental values and associated components. The term —mitigation‖ applies to four steps, or levels, in the mitigation hierarchy.



General principles



1. Maintaining the integrity and natural functions and processes of ecosystems, and the resilience of ecosystems, is prerequisite to sustainable use of natural resources, and essential to maintaining ecosystem goods and services over time.
2. The mitigation hierarchy is applied in order of priority as follows:
 - a. Avoid
 - b. Minimize
 - c. Restore On-Site
 - d. Offset (Off-Site or On-Site)
3. Generally, the —higher the priority of the environmental value and associated component, the more protective the mitigation measures.
4. For an action or measure to be considered —mitigation, a party must accept responsibility for implementation of appropriate mitigation measures, and there must be certainty that the mitigation measures will be carried out.
5. Implementing mitigation measures can help resolve issues that may delay or prevent a proposed project or activity.

General considerations

1. Which environmental values and associated components will be impacted by the proposed project or activity? (This will be determined from the output of the environmental impact assessment, i.e., the Environmental Impact Assessment and Mitigation Plan)
2. Have mitigation measures for impacts on environmental values and associated components, at all scales, been considered?
3. What is the current condition of each environmental value and associated component actually present within the footprint and area of influence of the proposed project or activity?
4. Can impacts on one or more environmental values or associated components be more fully mitigated than impacts on other environmental values and associated components?
5. Are there multiple environmental values and associated components with conflicting management needs and potential conflicts that need to be considered?
6. Is sound guidance available and being used, e.g., are best management practices (BMPs) and guidelines available for affected environmental values and associated components?

7. Is there opportunity to collaborate with other proponents that may have interest in overlapping mitigation measures?

The environmental issues have 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:

- Project location
- Project design
- Construction stage
- Operation stage

Environmental Parameters:

Environmental Impacts due to project location:

Project is present in the industrial cum agriculture area of the District Sheikhpura. Many other industrial units are also present near by the project area. The project is proposed Installation of incinerator; the site does not fall in the category of sensitive area and no environmentally sensitive localities exist within radius of study area. Access road Sheikhpura network is available at the project site. If the project proponent maintain HSE conditions and comply with the PEQS limits than, there will not be any significant impacts of the project on the environment. If the mitigation measures are effectively implemented, the residual impact of the Subject project activities on the area's geophysical environment is expected to be insignificant.

Impact significance: Low to moderate

Nature of impact: Direct

Duration: Long-term

Timing: Construction & Operation phase

Reversibility: NA

Likelihood: Low

Consequences: Mild or may be positive

Mitigation Measures

- Project site will have good and efficient road infrastructure that already exists there at the project site.
- Location can be considered as the positive impacts due to enhanced infrastructure.



- The project will also have positive socioeconomic impacts because of provision of jobs to the local residents of the area.
- No human settlement within the radius of the study area
- There would be no issue of congestion of traffic due to presence of good road network in the area.

Environmental Impacts due to the project design

Subject project is proposed installation of incinerator under the name of M/s Geo Links Pvt. Ltd. Storage & handling of solid waste, waste water treatment facility and solid waste management and area of parking will be reserved within project site. Firefighting plan, health & safety plan, tree plantation plan, emergency response plan will be incorporated during the design phase of the project.

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

- Structural stability of the proposed project.
- Soil structure and soil bearing capacity
- Road infrastructure design
- Emergency exit in the proposed project
- Firefighting system
- Wastewater disposal system design
- Rain water harvesting capacity of the drainage system
- Electricity hazards

Impact significance: moderate to high

Nature of impact: direct

Duration: Long-term

Timing: Constructional phase & Operation phase

Reversibility: NA

Likelihood: moderate to high

Consequences: moderate to high

Mitigation measures and recommendations

Following are the mitigation measures and recommendations to minimize the anticipated impacts:

- Each industrial unit will incorporate all HSE measures regarding the design of project.
- Structure stability of the building should be ensured.
- Emergency exist 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.
- Electricity wires should be covered by thick plastic/electricity resistant covers.

Impacts during construction:

Impact:

Change in topography and soil erosion.

Mitigation:

- Cuttings of trees will be avoided,
- Use of existing paved tracks.
- Project is located at leveled land

Impact:

Air quality deterioration, particulate matter/dust emissions due to construction activities; stand by generator, equipment's and vehicle.

Mitigation:

- Sprinkling of water on track will reduce dust pollution
- Provision of dust masks for workers.
- Air quality monitoring is recommended on regular base
- Proper paved road infrastructure is recommended

Impact:

Noise pollution can be generated due to construction equipments, machinery and vehicles.

Mitigation:

- Project manager will ensured less use of horns by project vehicles.
- Use of proper silencers, mufflers and other noise abating devices.
- Noise level monitoring will be conducted if required
- Visiting vehicles schedule will be maintained to avoid noise during night time.
- Route selection is also important to avoid noise pollution during night time.
- Noise level monitoring is recommended

Impact:

Water Resources can be depleted due to water requirement during construction.

Mitigation:

- Water wells will be designed to abstract water preferably from deep aquifer not being used by local communities.
- Maintenance and repair of water supply lines will be done properly.
- Water will be conserved at maximum level.

Impact:

Soil can be contamination due to vehicles and equipment's use and fuel storage at the site.

Mitigation:

- Fuels, lubricants, and chemicals will be stored at paved area.
- Availability of shovels, plastic bags and absorbent materials will be ensured near fuel and oil storage areas.

Impact:

Wastewater generation due to construction activities

Mitigation:

- Wastewater generated during construction and domestic activities will be stored temporarily in septic systems comprising of septic tanks from where it will be routed to local drain/ nalla) present near the project.
- Waste segregation measures will be employed to minimize entry of solid waste into the wastewater stream.
- An appropriately designed septic tank will be used to treat sewage/waste water to achieve NEQs.
- Periodic cleaning of the septic tank is recommended.

Impact:

Solid Waste Generation due to construction activities and project.



Mitigation:

- Construction waste will be reused or utilized for road filling or landscaping purposes
- Separate bins will be placed for different type of construction & domestic wastes
- Sale out to contractors
- Proper housekeeping will be ensured at workplace

Impact:

Socio-economic environmental impact like health safety and security

Mitigation:

- Employees and workers will be informed prior to start the construction
- Employment opportunities for local residents will be ensured.
- Basic health facilities will be provided to the workers.
- Security will be provided to workers.
- Local people will be preferred for hiring during project establishment

Impact:

Safety & Health impacts during establishment

Mitigation:

- Use of PPEs at workplace to avoid the health impacts

Machinery used for establishment/construction activities will not be left in working condition

Impacts during Operational phase:

This section reviews the impacts of the proposed incinerator on the surroundings environment as a result of the operation of the hazardous waste incinerator. A normal operation of the incinerator normally generates the following types of emission:

A. Storage of Waste:

The project site will be available with the paved floor storage area for temporary waste storage. This facility could create impacts of major significance if not properly handled and supervised. The storage area have proper covering for waste. This storage facility would help:

- To prevent scavenging of waste.



- Scattering of waste with wind.
- Nuisance from smell and odor.
- Protect the waste from sunlight and rain

Recommended Mitigation Measures

The storage facility requires following measures to be adopted for safe and healthy working conditions without affecting personnel's health and environment:

- Industrial waste should be incinerated the on the day it is received.
- Paved flooring to avoid leaching of any liquid material.
- The storage tank must be marked as storage facility.
- The workers must wear personal protective equipment like Gas mask, gloves, overall and safety shoes before entering the storage tank
- Ensuring the housekeeping of area around the storage tanks and especially inside the facility

B. Air Emissions

Stack Emissions

The combustion of any substance will generate by-product emissions that could be released to the air. Waste burning processes generate wastes, which contain particulates, sulphur and nitrogen oxides, volatile organic compounds, dioxins/furans and acidic gases. The Particulates also includes heavy metals present in the waste. Primary attention needs to be focused on gaseous emissions of particulates less than 10 microns in size, dioxins/furans, sulfur dioxide and nitrogen oxides due to associated Incinerator air emissions can have a major impact on the local and regional air quality if not controlled properly. The pollutants can seriously impair human health and damage vegetation and other materials.

Recommended Mitigation Measures

To limit these emissions the incinerator should be properly operated and carefully maintained. The temperature in the primary chamber should be around 600-800°C and in the secondary chamber 900- 1200°C as much as possible of the materials, which lead to these contaminants, will therefore help to minimize harmful emissions to atmosphere.

- Incinerator would have installation of Bag houses to collect fine particles to meet PEQs limits.

- It has been found that a strong correlation exists between combustion temperature, residence time and dioxin emission. The California air resources board recommends minimum temperatures of $98.22 + 87.77^{\circ}\text{C}$ with a minimum residence time of 1 second. The design of Incinerator should operate under the conditions as per specifications to minimize the production of dioxins.
- Production of CO and HC are directly related to the combustion efficiency therefore the optimum conditions must be ensured to prevent their production. The reasons could be incomplete burning of waste, due to fuel—rich burning (overloading of the furnace) and insufficient temperature caused by high moisture content of waste.
- Regular and thorough cleaning of the incinerator, including ash removal is absolutely essential for efficient operation. An accumulation of ash/unburnt material/incombustible matter will cause excessive temperatures to be generated and should therefore be avoided. The incinerator should be cleaned and all ash removed regularly. Free passage of air is essential for combustion as well as for the cooling process. Therefore the removal of deposits from within as well as underneath the combustion chamber is critical.
- Good combustion practices can control emissions by ensuring that the temperature in the combustion chamber and the time the Waste remains in the combustion chamber are kept at optimal levels. Major variations in these or other incineration operations could lead to a limited but significant belch of contaminated air emissions.

C. Ash Generation:

After incineration ash would generate and this Incinerator ash can contain concentrations of heavy metals such as lead, cadmium, mercury, arsenic, copper and zinc, which originate from plastics, colored printing inks, batteries, certain rubber products. and hazardous waste from households and small industrial generators. Recommended Mitigation Measures:

Bottom ash and fly ash are often managed together and referred to as —Combined ash. Incinerator ash is usually disposed off in a Hazardous Waste (HW) landfill or an ash-only landfill known as an Ash Monofill. Ash Monofills are specially designed to reduce the ability of heavy metals to migrate from the ash into the environment. Monofills are often co-located with HW incinerators or existing landfills to reduce transportation distances and siting difficulties. The principal environmental concern of the public regarding incinerator ash is that when ash is



disposed off in a landfill, the metals and organic compounds can leach (i.e. dissolve and move from the ash through liquids in the landfill) and migrate into ground water or nearby surface water. In addition to possibly contaminating water supplies. Incinerator ash could also affect human health through direct inhalation or ingestion of airborne or settled ash.

Proposed Ash Disposal Plans

Initially the ash would be collected from reaction chambers and bag filters in from of the heap which should be should be properly wetted or covered so that there are no fugitive dust emissions, after that this ash will be disposed into landfill site.

D- Noise Levels

Increased noise and vibration during operation can cause significant impacts.

Specific Mitigation Measures

Places where workers are exposed to excessive noise provide ear protection to maintain noise levels below 85dB. Ear protections include Molded and pliable earplugs, cup-type protectors and helmets. Such devices may provide noise reductions ranging from 5 to 35 dB.

Mitigation Measures for Occupational Health & Safety

- Wear safety shoes with non-skid soles
- Wear long-sleeve shirts and protect hands with protective gloves.
- Wear appropriate eye protection; consult a safety supervisor or a supplier
- Arrange for periodic inspection of incinerator structure integrity, to detect any cracking, etc.
- Wear respiratory protection (Gas Mask) during maintenance or other work in which dust and noxious gases may be released into the atmosphere

Potential Impact on Social and Cultural Environment

Following parameters will be adapted for the assessment of the well-being of the poor people near the project site that will use to assess the social, economic, and cultural impacts of the project.



A- Inconvenience due to raw material and product transporting Vehicles:

During the operational period a minor impact can be the movement of vehicles from the main road to the subject project boundary; it can affect the traffic on other roads and can cause minor annoyances to the residents and other industrialists of the area. The transportation of heavy materials and equipment likely to damage the roads use for the transportation of heavy machinery.

Mitigation measures: Efforts will make to discuss traffic conditions so that regular traffic might not disturb. Transporters engage for the project will be forced to adhere to the load specifications of the access road. No overloading will be allowed in any case.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: reversible

Likelihood: low

Consequences: low, as it links the main Sheikhpura Road and vehicles rarely used the sub roads

Impact significance: slightly significant

B- Cultural Issues:

Induction of outside workers in the Contractor's labor can cause cultural issues with the local community as the local community is very sensitive about their cultural values. Also theft problems to the local community may arise by the labor force and vice versa.

Mitigation Measures:

Good relations with the local communities will be promoted by encouraging contractor to provide opportunities for skilled and unskilled employment to the locals, as well as on-the-job training in construction for young people. Project manager will restrict his staff to mix with the locals to avoid any social problem.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: reversible

Likelihood: low

Consequences: low, project proponent implemented mitigation measure,

Impact significance: slightly significant

C- Accident risks:

Unmonitored construction activities can create an accident risk for the local residents particularly children and labor force.

Mitigation measures:

Contractor must have first aid kits along with the medical officer in the field in case of minor injury, but for unfortunate accident services of nearby hospitals availed. Routine medical check-ups of the entire field staff including unskilled labor conducted by a qualified doctor are recommended.

Training of the workers must be arranged regarding safety procedures, environmental awareness, equipping all construction workers with PPEs, safety boots, safety helmets, ear plugs, gloves and protective masks. Monitoring must be carried out to check for the sustainable use of PPEs.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: not applicable

Likelihood: moderate

Consequences: moderate, if complete trainings and mitigation measure will implement.

Impact significance: significant

D- Privacy Issues:

Disturbance can be happen at the time of construction, to the privacy of women residing in the work area when workers worked at height.

Mitigation Measures:

Contractor will take care of the privacy of residents, especially women near the working area.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: reversible

Likelihood: low

Consequences: low, as contractor took care of the matter

Impact significance: slightly significant



E- Sharing of resources:

During the construction and operational phase of the project, workers will share the common resources like potable water, fuel, wood. It can create conflicts between work force and local population.

Mitigation measures:

The contractor will maintain a close friendly relationship with the local communities to ensure that there may not be any conflict related to common resources utilization. He must get permission of the local population before using their common sources of water and other resources.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: reversible

Likelihood: low

Consequences: low, if conditions will be followed and mitigation measures employed

Impact significance: significant

After assessing the project activities and investigating the project area, the environmental consultants, PGEE, have concluded that, if the activities are undertaken in this report, and the recommended mitigation and environmental management measures are adopted, the project will not result in any long-term or significant impacts on the local community or the environment.

Potential Environmental Enhancement Measures:

The proposed project will be installed with all precautionary measures to enhance and safe the environment. Following necessary measures will be adopted during construction and operation:

- Sprinkling of water will be done on dusty roads and tracks.
- PPEs will be provided during construction activity.
- Constructional waste and domestic solid waste will be disposed-off, recycle 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.
- Machinery will be kept maintained.
- Mark the boundary around the working area.
- Waste water will be treated through waste treatment system that will be installed within the premises of the subject project.
- 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.
- Solid waste will be handed over to contractors and agreement will be made.
- 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.

Purpose of Mitigation measures

Purpose of mitigation measures should include:

- **What is the problem i.e. in terms of “major environmental impacts” which may arise by the subject project activity?**

The major impacts may arise by the subject project are, dust, noise, solid waste, and waste water. Other impacts are of minor importance. These impacts will arise during construction and operation but precautionary measures will be adopted prior to start the activity, during the activity and post activity.

- **When the problem will occur and when it should be addressed?**



Any impact that would arise due to the subject project activity will be addressed through proper channel and on site. Trainings will be conducted regarding HSE, firefighting, best work practices etc. while other precautionary measures are also adopted to make the project safe and environmental friendly.

- **Where and how the problem should be addressed?**

Project proponent will be responsible for the implementation of EMP and if required he will appoint a HSE manager/environmental manager along with site manager to assess any impact that could be arisen during construction and operation of the project. He is responsible to address the problem and to mitigate it.

Ways of achieving mitigation measures

By adopting proper mitigation measures, any anticipated major or minor environmental impacts could be controlled or mitigated. The detail of impacts and mitigation measures have been discussed previous chapters.

- **Changing in planning and design:**

Project proponent of M/s Geo Links Pvt. Ltd will take appropriate measures to provide pollution free and safe environment during the project activity by implementing improved management practices and monitoring techniques suggested in EMP. Management will further take necessary actions to mitigate any residual impacts.

- **Improved monitoring and management practices:**

Project proponent of M/s Geo Links Pvt. Ltd will adopt such plan that will assure the minimum impact on the environment and health by implementing proper mitigation measures. Design of the building will assure the structure stability in a long run.

- **Compensation in money terms:**

Project site is the property of M/s Geo Links Pvt. Ltd and there are not any land ownership disputes. If in future any issue would arise regarding environmental degradation, the project proponent will compensate in money terms as he has assured to achieve NEQS/ PEQS and compliance to other regulations made under PEPA 1997 (Amended).

- **Replacement, relocation and rehabilitation:**



Plantation will be done within the unit and for this area will be reserved. Project proponent will further develop Restoration/ reclamation or tree plantation plan to restore the project area. Plantation will be enhanced with native species within the unit, along the boundary wall and along the road side as per direction by EPA Punjab.



Chapter # 5

ENVIRONMENTAL MANAGEMENT & MONITORING PROGRAM

Aim of Monitoring

The aim of monitoring is to oversee the environmental performance of the project through its lifecycle enforcing the NEQS. Timely implementation of mitigation measures leads to sustainable environmental management of the project.

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.

Environmental Monitoring Plan

- The monitoring is carried out in accordance with NEQS.
- Monitoring program is undertaken for compliance of mitigation measures.
- Monitoring for various parameters is done before the construction phase as per direction from EPA.

Performance Indicators

The performance indicators / parameters having significant impact on physical, biological and socio-economic environments will be evaluated. These are given below:

- **Ambient Air Quality**

Dioxins and Furans, HCl, Hg and its components, PM₁₀, CO, NO_x, and SO₂



- **Water Quality**
TDS, TSS, COD, oil and grease, chloride, lead, zinc and cadmium
- **Noise Levels**

Environmental Monitoring Cell (EMC)

EMC of the project will undertake monitoring of the Safety, Health and Environmental Aspects. It will ensure implementation of EMP and apprise the General management of the unit on fortnightly basis.

Training of Monitoring Staff

Training of the monitoring staff will be arranged at site and off site Special cadres will be run about functioning of the project and apparatus including the firefighting and first medical aid.

Monitoring of Quality

The EMC will arrange monitoring of the quality of air, water, noise and waste water on quarterly or monthly basis from any EPA Certified/approved laboratory if required.

Monitoring Stages

Monitoring Stages

Monitoring of environmental parameters need to be carried out during the following stages in addition to post-project period:

- Construction Stage
- Operation Stage

Monitoring Plan

Following aspects need to be monitored regarding the subject project during pre-construction, during construction and post construction.

- Air quality
- Water quality
- Noise level
- Management of utility services including water supply, sewerage disposal, electric supply and solid wastes.



Management Approach:

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

A certain degree of redundancy is inevitable across all management levels, but this is in order to ensure that compliance with the environmental management plan is crosschecked.

Institutional Capacity, Environmental Technical Assistance and Training Plan

Following functionaries will be involved in the implementation of EMP:

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

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 effective implementation of the EMP.

The training modules will include air, noise and water pollution monitoring, social awareness, Environmental Laws, National Environmental Quality Standards (NEQS), Usage of personal protection equipments, 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.

Training of Workers and contractor

Training of building contractor & workers will be the part of the TORs regarding the construction of the scheme. 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. Handling of hazardous waste in a safe way
3. Proper handling of Ash disposal
4. Use of PPEs
5. Maintenance of vehicles and submission of Environmental Monitoring Reports
6. Maintenance of Water Consumption records
7. Testing of water and waste water and submission of Environmental Monitoring Reports
8. Placement of safety signs/boards during construction
9. Sprinkling of water on the roads and dusty tracks
10. Monitoring of generator emissions

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

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.



Summary of Impacts and their mitigation measures:

Table 5: Summary of impacts and mitigation measures

Impacts	Mitigation Measures
Project Location	
• Acquisition of land • Loss of environmentally sensitive areas • Changes in traffic pattern • Potential conflicts with stakeholders • Resettlement issues	✓ It is recommended for obtaining of approval from other relevant departments. ✓ The proposed land is the property of the M/s Geo Links Pvt. Ltd. ✓ There is not any sensitive area near the project site. ✓ Many other industries are also working near the project site. ✓ The project proponent will achieve the NEQS/ PEQS at the boundary walls of the subject project to avoid the environmental impacts on the nearby industrial unit. ✓ There is no need to change the traffic pattern due the development of the subject project because no. of industries has been developed at the same road. ✓ It is recommended to settle the issues through scoping and specific group discussions. ✓ No resettlement issues
Project Design	
• Structure stability • Soil structure and soil bearing capacity • Road infrastructure design • Emergency exits • Firefighting system • Wastewater disposal system design • Electricity hazards	✓ Structure stability of the project building should be ensured ✓ Geotechnical investigation of the project site should be conducted. ✓ Safe road infrastructure design should be provided at the project site. ✓ Emergency exist points should be marked within the project building.



• Ventilation	✓ Firefighting equipment must be maintained at the site in good working condition. ✓ Efficient wastewater disposal system should be designed for proper treatment of wastewater ✓ Electricity system should be designed safe and sound. ✓ Proper ventilation should be ensured in the project building.
Construction and operation phase	
Land & Soil	
• Land or Soil Erosion during the construction phase • Habitat destruction • Scarring of the landscape and aesthetic beauty. • Clearing of native plants will disturb the complexity of the ecosystem of the proposed area. • Leakage of oil from storage area may contaminate soil	✓ Sprinkling of water is recommended ✓ After construction phase, the project proponent will restore the land by plantation. ✓ All spoils will be disposed of as desired and the site will be restored back to its original conditions ✓ Aesthetic of the area will be maintained. ✓ Oils, lubricants, chemicals, and other listed hazardous materials should be stored safely at their designated spots, enclosures or store rooms, which should be safe from rainfall and away from any potential source of fire
Air pollution and Dust emission	
• The transportation of the project machineries and material also may cause dust. • Un-metalled roads may cause dust. • Dust raised on dirt tracks by project-related vehicles. • Dust from drilling of deep holes.	✓ Air emissions controlled devices (Bag filters) must be installed to control the air pollution ✓ Water the construction site periodically to minimize fugitive dust generation while laying foundation ✓ Store all construction materials in a manner to minimize generation of dust



Combustion products from vehicles used for project-related activities	and spillage on roads. ✓ During excavation works drop heights will be minimized to control the fall of materials reducing dust escape. ✓ Sprinkling of water must be done to control the dust or PM ✓ Vehicle emissions inspection should be done on regular basis ✓ Sprinkling should be done on the unpaved area to avoid dust pollution/particulate matter. ✓ Vehicles/ trucks should be serviced regularly ✓ All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke.
Noise	
- The major sources of the noise at proposed project site are project related machinery. - High noise level cause hearing loss, deafness, high blood pressure, headache, depression and mentally disturbance. - Noise level will not exceed 75 dB(A) at the distance of 2 km radius, activity site is located at a safe distance from the nearest human settlement . - Noise from construction activities from site preparation, earth works, foundation and plant equipment installation	✓ Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the workers and other staff of the subject project. ✓ Proper maintenance and tuning of the vehicles should be done. ✓ Sound proof room should be built for generator (if any) to control the noise. ✓ A speed restriction of 40 km/h will be imposed on all construction vehicles.
Waste Water	
- Domestic waste water from the camp - Minor generation of waste water	✓ Domestic waste water will be drained out in nearby local drain after treated



from construction activity. • Water Contamination due to improper storage of construction material, • Water contamination due to improper debris disposal, • Spread Of diseases, underground water contamination	in septic tanks ✓ Oils, lubricants, chemicals, and other listed hazardous materials should be stored safely at their designated spots, enclosures or store rooms, which should be safe from rainfall
Solid waste/Ash	
• Solid waste may generate from Construction activity, domestic and packing material of project related machineries. • Solid waste may generate from operation of project.	✓ A solid waste management division should be formulated to deal with the proper disposal of solid waste, supervised by HSE Manager, SW Manager, and other related personnel. ✓ Solid waste generated from the construction activity as sand, stones residues etc. that should be utilized in restoration of the quarry area whereas solid waste from the domestic sources should be disposed off properly ✓ Proper solid waste management system is recommended for ✓ Solid waste related to the operation will also manage in scientific way. ✓ Ash generated from Incinerator and bag filters will be disposed of in Landfil site.
Health and Safety	
• Health and safety issues will be arose during construction activity, handling of material, machinery and improper practices of work • Health safety issue may arise during regular operations	✓ Use of PPEs should be implemented at workplace. ✓ First aid measures/medical facility should be provided to project related employees. ✓ Safe drinking water must be provided to workers, staff, and poor people of the area. ✓ Water consumption records should be maintained



	✓ Safety signs & boards should be placed at during construction activity. ✓ Construction site should be fenced properly to avoid any damage to nearby settlements ✓ smoking or any drugs should be prohibited during working hours or performing work ✓ At the time of earthwork, fencing will be ensured for the area under the exploration
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Equipment maintenance details:

The subject project is installation of Incinerator under the name of M/S Geo Links Pvt. ltd. The company will maintain the records for Health Safety & Environment and will hire HSE manager to check and deal with the HSE issues of whole estate. Individual industries will also hire HSE manager to maintain HSE condition within their respective industry. The company shall maintain PPEs, medical facilities, firefighting Equipment's as fire buckets, fire hydrants and fire extinguishers and records for their periodic fillings or replacement.

Environmental Budget

The cost which is required to effectively implement the mitigation measures is important for the sustainability of the Project in operation stage of the Project.

Company has allocated the Environmental Budget of 2% of total cost for the Training, maintenance and management of Environment that will include filling and maintenance of equipment's, 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 be included in this budget.



ENVIRONMENTAL MANAGEMENT PLAN

Serial. No	Aspects	Impact & Mitigations to be taken			
		Impacts	Mitigation measures Construction/Operation	Responsibility	Monitoring
Land acquisition for the proposed project					
1	Land acquired for the lease for the proposed subject project	Nil	• The site for proposed project is property of proponent	Proponent	Environmental Consultant/ EPA Punjab
Land use & soil erosion					
2	Land Use &Soil	Particulate Matters (PM) pollution, Clearing of the vegetation Scarring of the landscape and aesthetic beauty. Clearing of native plants will disturb the	• Measures will be taken to avoid soil erosion and dust pollution. • Restoration and reclamation plan will be developed to restore the natural landscape of the area. • Plant nursery, garden will be developed to rehabilitate the native plants of the area. • Project proponent will make any possible efforts to limit the impact on flora and fauna. • The management of proponent has serious concern to preserve the environment and	HSE Department	Environmental Consultant/ EPA Punjab



		complexity of the ecosystem of the proposed area. Dust emissions will generate during the construction Flue gases will be generated due to the involvement of generators and other machinery.	natural elevation beauty of the site		
Ambient Air Quality					
3	Air Quality	Particulate Matter, NOx, Sox, Dioxins and Furans and other gasses will release from stacks. - Dust emission due to vehicles on un-metalled roads. - Dust due to Construction	- Air emissions controlled devices (Bag houses) must be installed to control the air pollution - Water the construction site periodically to minimize fugitive dust generation while laying foundation - Store all earthwork and construction materials in a manner to minimize generation of dust and spillage on roads. - During excavation works drop heights will be minimized to control the fall of materials reducing dust escape: Temporary cover may be provide for	HSE Department	Environmental Consultant/EPA Punjab



ENVIRONMENTAL IMPACT ASSESSMENT REPORT
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		• Dust raised on dirt tracks by project-related vehicles. • Dust emission during earthwork • Gases emissions from the vehicles Air pollution due to site visiting vehicles/ transported trucks, Hauled trucks, machinery & generator (if any)	• earthwork if necessary • Sprinkling of water must be done to control the dust or PM • Vehicle emissions inspection should be done on regular basis • Sprinkling should be done on the unpaved area to avoid dust pollution/ particulate matter. • Vehicles/ trucks should be serviced regularly • All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke. • Quarterly or monthly monitoring is recommended by EPA certified labs to check the compliance with NEQS as per EPA NEQS Rules 2001 Air quality was conducted by EPA certified lab and results are incorporated within this report		
Noise & Vibration					
4	Noise	The major sources of the noise at site are project related machinery.	• Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the	HSE department	Environmental Consultant/ EPA Punjab



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		High noise level cause hearing loss, deafness, high blood pressure, headache, depression and mentally disturbance. Noise level will not exceed 75 dB (A) at the distance of 2 km radius, activity site is located at a safe distance from the nearest human settlement . Noise from construction activities from site preparation, earth works, foundation and plant equipment installation.	workers and other staff of the subject project. • Proper maintenance and tuning of the vehicles should be done. • Sound proof room should be built for generator (if any) to control the noise. • A speed restriction of 40 km/h will be imposed on all construction vehicles. • Quarterly or monthly monitoring is recommended by EPA certified labs to check the compliance with NEQS as per EPA NEQS Rules 2001. • Noise level monitoring was conducted at different location and results are incorporated within the <i>report</i>.		
Soil Contamination					
5	Soil contaminatio	Contamination of soil due to oil and other	• Industrial waste will be stored in a storage area having impermeable floor, which would not allow to	HSE Department	Environmental Consultant/ EPA



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	n	chemicals storage, transportation Soil contamination due to waste water generated from the project activities	leaching of anything. • Ash generated from incinerator will be disposed of in a proper landfill in site. • SOPs will be developed for the storage of oil and other chemicals handling and transportations • Soil contamination must be controlled by adopting mitigation measures such as storage of oil, fuels etc. under paved area, by maintaining leakage record of construction vehicles, and by regular inspection (admitted by proponent). • Septic tanks will be used for treatment of water. Treated water will be drained into nearby Industrial drain. • Tarpaulin sheets should be placed under generators and other leaching substances • Treated water will be used for plantation Proper storage of oil, fuel etc. is recommended under paved area		Punjab



Health and safety					
6	Health and safety	Health & safety issues of workers and nearby community	• Trainings of the workers is recommended for health & safety, first aid and firefighting. • Proponent must provide First aid facilities to workers in case of any injury or accident. • Safe drinking water must be provided to workers, staff, and poor people of the area. • Water consumption records should be maintained • Provision of Proper PPEs must be ensured at workplace • Assembly point and exit points must be available at workplace • Electric wires, D.Bs must be kept covered & closed to avoid any electric hazards • smoking or any drugs should be prohibited during working hours or performing work • Safety signs & boards will be placed at the time of construction activity • Security guards will be appointed at the construction site • At the time of construction and earthwork, fencing will be ensured for	HSE Department	Environmental Consultant/ EPA



ENVIRONMENTAL IMPACT ASSESSMENT REPORT
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			the area under the exploration Further proper housekeeping and safety arrangements must be ensured at the subject project		
Waste Water					
7	Waste water	Minor generation of waste water from construction activity. Water Contamination due to improper storage of construction material, Water contamination due to improper debris disposal, Waste water pollution, Spread of diseases, underground water contamination	- Waste water generated from the constructional activity will be used as sprinkling on the dusty tracks or for restoration of the land. - Waste water monitoring is recommended on monthly or quarterly basis by EPA certified lab to check the compliance with NEQS and as per EPA NEQS Rules 2001 - Domestic waste water will be treated in septic tanks and treated water will drain into nearby industrial drain.	HSE department	Environmental Consultant
Solid waste generation					
8	Solid Waste/Ash Generation	Land & soil contamination, aesthetic degradation,	A solid waste management division will be formulated to deal with the proper disposal of generated Ash supervised by HSE Manager, SW	HSE Department	Environmental Consultant/ EPA Punjab



ENVIRONMENTAL IMPACT ASSESSMENT REPORT
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		foul smell etc. Solid waste generation from the construction activity, domestic and project process sources	Manager, and other related personnel. • A nearby landfill) will be used to dispose of all type of generated ash. • Constructional waste must be utilized for road filling or maintenance purposes • Sludge from the septic tank must be replaced on regular basis • It is recommended to ensure Proper housekeeping. • It is recommended to adopt proper waste management system		
Odor					
9	Odor	There will generate odor while moving and storage of collected industrial waste.	While transferring the industrial waste, it will be properly covered to minimize its odor. Collected industrial waste will not be stored for long time in storage area. Incineration of per day collected waste will be ensured to minimize the its scavenging and odor.	HSE Manger	
Energy requirement					
10	Energy	Resource depletion	• Do not waste the energy/electricity	HSE	Environmental



ENVIRONMENTAL IMPACT ASSESSMENT REPORT
Of M/s Geo Links Pvt. Ltd, Sheikhpura

	requirement		when there is no need of it. • Use energy efficient machinery and equipment • Use energy saving products • Conduct and maintain records for energy audits • Do not leave the machinery in running form when there is no working being done • Machinery must never be left unattended • It is recommended to save and conserve the energy and adopt energy efficient technologies during the construction phase	Department	Consultant/ Punjab EPA
Socio economic impacts					
11a	Resettlement	Resettlement issues	• The proposed area under the investigation is devoid-off any human settlement	NA	NA
11b	Language	Change in cultural 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	Proponent	NA
11d	Health	Social performance of the individuals in the	• The project proponent will assist the local impacted community for the improvement of health services	Proponent	proponent



ENVIRONMENTAL IMPACT ASSESSMENT REPORT
Of M/s Geo Links Pvt. Ltd, Sheikhpura

		area			
11e	Culture and norms of the Area	Change in culture by the influx of nomadic people	• Maximum local employment should be ensured to preserve the culture of the area	Proponent	NGO survey/Environmental Consultant



Need for Disaster Management and Emergency Response System

In order to cope up with the possible hazards it is imperative to prepare the Disaster Management Plan and rehearse it frequently. To evaluate effectiveness of the system preparedness exercises and drills will be undertaken frequently. Small courses will be run to train the relevant persons about their actions during emergency. The administration staff need be familiar with the firefighting procedures and equipment.

Communication System for Declaring Disaster and Emergency Situation

On immediately on occurrence of emergency situation all employees will be informed through disaster Alarm System. The emergency siren means that all employees will assemble at the previously designated assembly areas. At this place the Head of HSE department will instruct the workers regarding their respective duties.

Identification of Risks/Possible Threats

The project and other occupants may come across untoward incidents on account of human interventions and natural catastrophes. Human induced risks may include the placing of an explosive device for causing damage to building and burning of essential office/documentary records. Improper use of electrical, heating and cooking gadgets may lead to outbreak of fires. Similarly the smokers may create large-scale burnings. The natural hazards consist of the possible damage to of the building due to an earthquake or windstorm. Thus there is need of carrying out risk assessment for such eventualities.

According to public Consultation natural disaster are very rare in the area. After the operation of the project proper SOPs will be developed to cope with emergency situation.

Risk Management

Definition of Risk

Risk may be minor, serious or fatal. It may be rare, often or frequent.

Risk = Damage X Rate of Occurrence.

Risks are broadly acceptable, tolerable, unacceptable and residual.

Elements of Occupational Health and Safety Management System (OHMS)

For an effective OHMS, the management of the project will implement the following elements:

- Formulation of OHS Policy



- Identification of risks, hazards and countermeasures
- Adoption of OHS targets based on OHS policy
- Formulation of OHS plans.
- Incorporation of opinions of stakeholders in OHS measures
- Implementation and operation of OHS plans
- Establishing an organization
- Documentation
- Emergency situation
- Routine inspections and improvements
- System audits
- Revision of OSHMS
- OHS education

Post Disaster Rehabilitation

On close of the disaster the management will immediately undertake activities for restoring the normalcy at the site. Efforts will be made to carry on with the operations.



Chapter # 6

PUBLIC CONSULTATION & STAKEHOLDER PARTICIPATION

This section deals with the social acceptability of the project and the area. Consultation with the stakeholders is a tool for managing two-way communication between the project proponent and the affected public. Its goal is to improve decision making and build understanding by actively involving individuals, groups and organizations, which have stake in the project. This involvement increases project's long term viability and enhances its benefits to locally affected people and other stakeholders. It gives the feeling of an ownership to the local population and public indolent is also helpful in smooth implementation and success of the project.

In order to evaluate the socioeconomic and environmental impacts, filed surveys are extremely essential. In addition to the surveys at the preliminary stage, consultation with the community and their active participation plays a vital role in successful implementation of the project. To identity the different types of stakeholders and ascertain their perceptions about the proposed project (Environmental Impact Assessment (EIA)) social survey was conducted. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed in the following pages.

Objectives of Consultation

Public consultation plays a vital role in studying the effects of the project on the stakeholders and in the successful implementation and execution of the subject project. Public involvement is a compulsory feature of environmental assessment, which leads to better and more acceptable decision making. The objective of the consultation with stakeholders is to help verify the environmental and social issues that have been presumed to arise and to identify those which are not known or are unique to the construction of the proposed unit.

The important general objectives of the consultation process are:

- Information dissemination, education and liaison;
- Informing the stakeholders about the subject project



- Providing an opportunity to local public to raise their views and helping in more sensitive considerations for the formation of mitigation measures for the subject project
- Providing those involved in the planning stage with an opportunity to ensure that the benefits of the proposal are maximized and that no major impacts have been overlooked
- It provides an opportunity to local public to influence the design of project in a positive manner
- Increasing public confidence in front of proponent, reviewers and decision makers
- Identification of problems and needs of the stakeholders and public
- Providing better transparency and accountability in decision making stage;
- Reducing conflicts through early identification of contentious issues and working on them to find acceptable solutions
- Reaction, comment and feedback of stakeholders on project;
- Developing proposal which are truly sustainable;

Methodology of consultation:

The EIA team carried out public consultations at various locations around the Project Site. 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 neighboring factory workers, residents, shopkeepers, drivers etc.
- Environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

Stakeholder identification:

Stakeholders considered at all levels according to the importance of the project. They are 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 (EPD Punjab, Irrigation department, Agriculture department, Wildlife department etc.), district level (EPD, Irrigation department, Agriculture department, Wildlife department etc.) & village level (Direct & indirect affectes and Locals)



Consultations with government, provincial and district level departments were carried out through meetings and visits while consultations with locals, villagers, neighbors and directly affected peoples were under taken during baseline study of the area.

Consultations were held with the followings;

District Level:

1. Environmental protection department, Sheikhpura.
2. Agriculture department, Sheikhpura.
3. Forest Department, Sheikhpura.
4. Wildlife department, Sheikhpura.
5. Irrigation Department, Sheikhpura.

Village Level:

1. Neighboring workers
2. Shopkeepers
3. Traders
4. Drivers

Consultations:

A series of public consultations were required to get the feedback/ concerns of the different departments, Industries, local public, PAPs, and general public residing near the subject area.

Proponent

Possible impacts and mitigation measures related to the proposed project 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 environmental friendly.

Responsible Authority

Management of M/s Geo Links Pvt. ltd is the responsible authority to take all measures throughout the life cycle of the project.

Other departments and agencies

For the impact analysis detailed meetings were held with the management of M/s Geo Links Pvt. ltd local 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.

Environmental Practitioners and Experts

Team of M/s **A.S. Enterprises** 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, some in abroad, 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.

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 Faisalabad area. They provided positive remarks regarding the proposed project. Stakeholders participation Performa's and socioeconomic questionnaire were get filled by the inhabitants to evaluate the project socio-economic impacts.

Sample size

50 sample size was 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.

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

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

Result and discussion

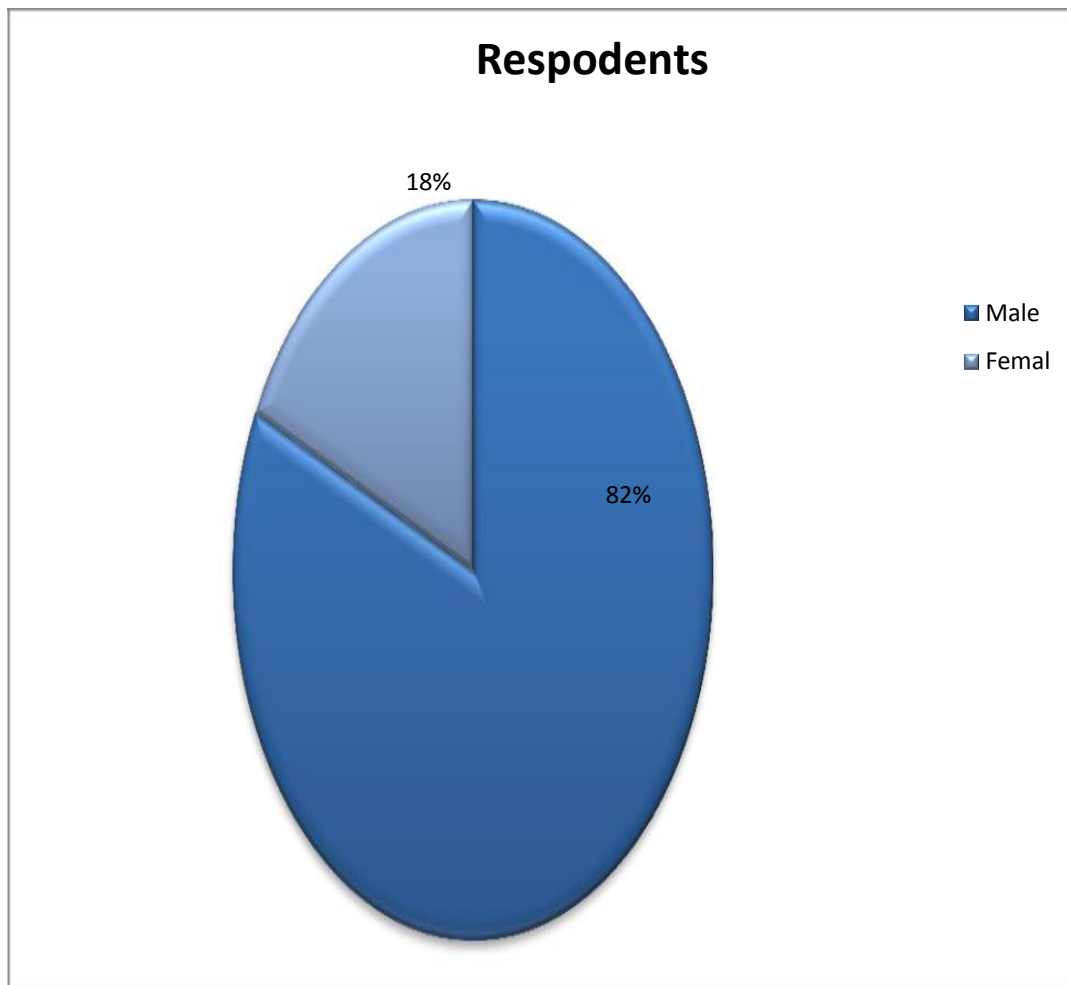


Figure 5: Gender ratio of respondent

Discussion

According to graphical representation, 82 respondents were male while 18 % 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.

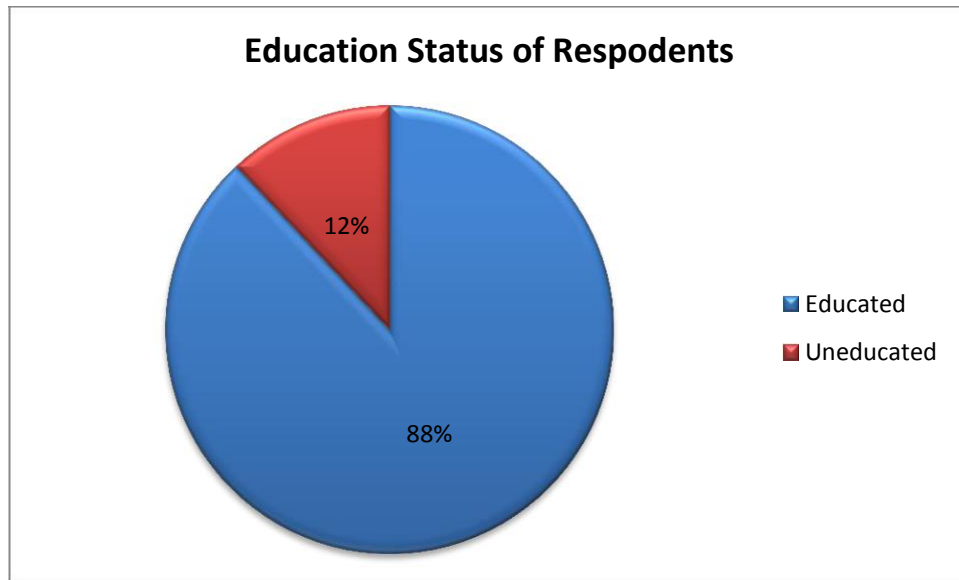


Figure 6: Education status of respondents

Discussion:

According to above graphical representation, 88 % respondents were educated while 12% were uneducated. So, according to the survey overall education status of the area is good.

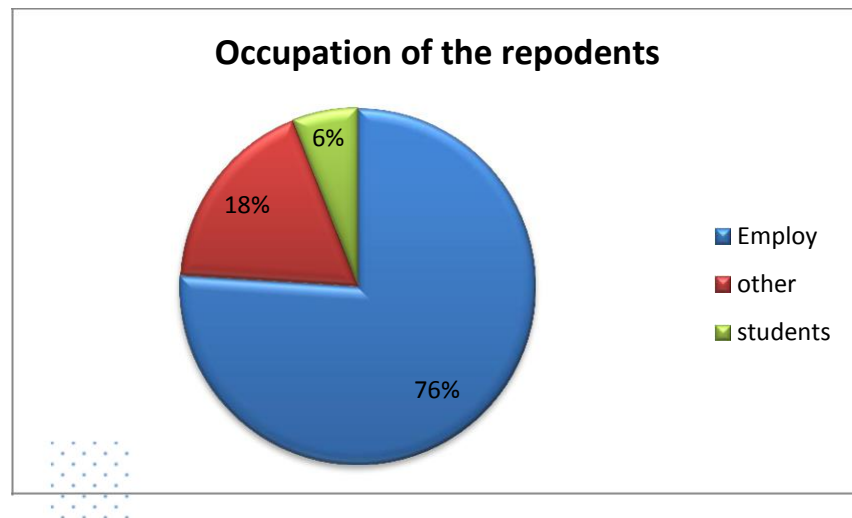


Figure 7: Occupation of respondents

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. According to the survey 6% were students while all other respondents' source of income was business man, farmers, doctors and teachers.

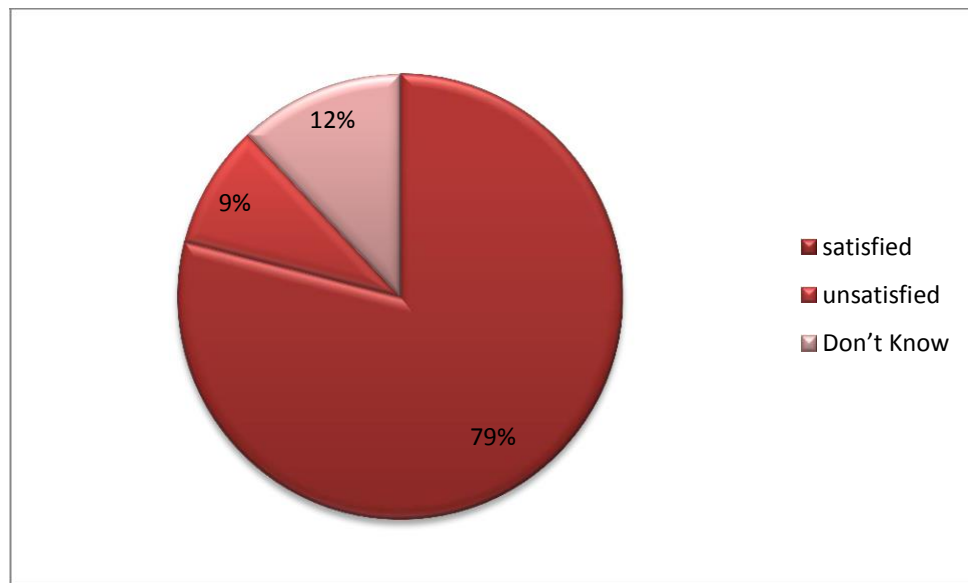


Figure 8: Ratio of people satisfied with the proposed project

Discussion:

As per survey, 79% people were satisfied with the proposed project of M/s Geo Links Pvt. Ltd and they gave positive remarks regarding the existing unit and proposed project as they got job over there, their living standard raise over working there. While 12% respondents were have no opinion regarding the project and 9% respondents were not satisfied with the production unit due to their concern regarding the aesthetic degradation and no preference to local people for jobs.



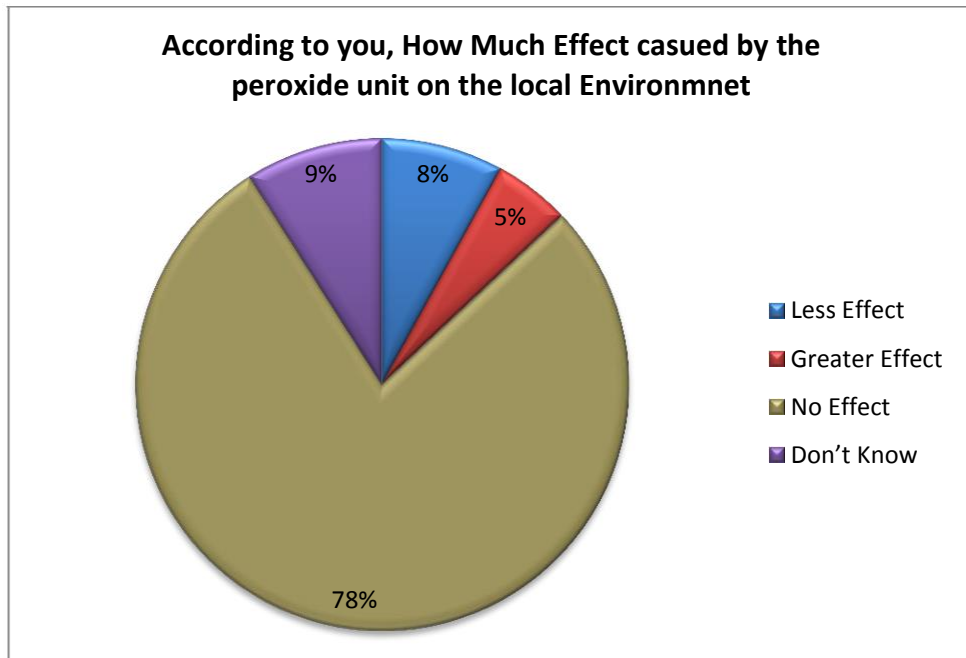


Figure 9: Ratio of respondent having different views regarding impact on environment

Discussion:

As per survey, 78 % respondents remarked that there is no effect caused by the proposed project on the area environment while 9% respondents had no point of view regarding the project activity, 8% respondents remarked that subject activity has less effect on the environment of area and only 5% remarked that construction activity has greater effect on the environment of the area.

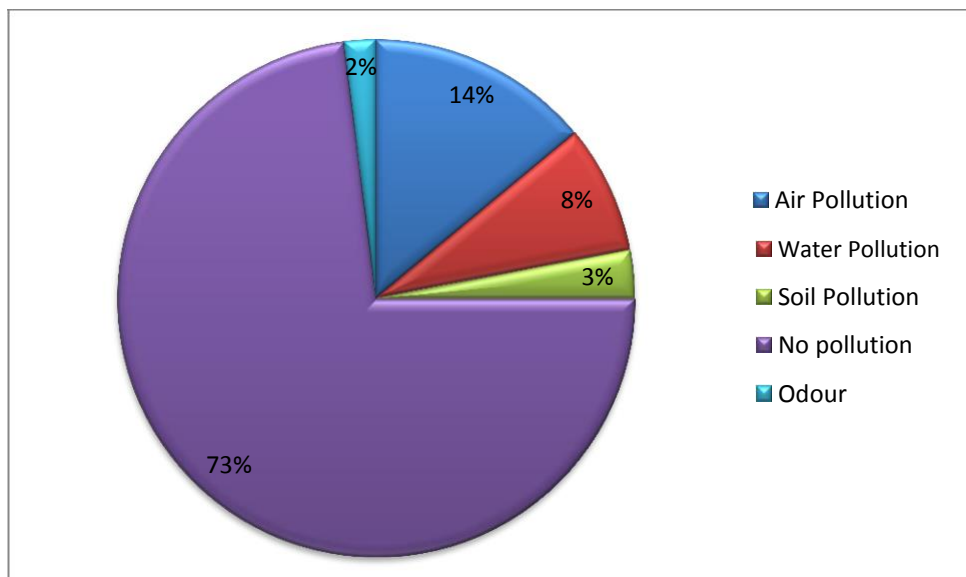


Figure 10: Type of pollution cause by the proposed project

Discussion:

As per survey of the area and graph indicates, some people gave remarks that there are higher air pollution (i.e. 14%) by the subject project, some people said that there is soil pollution caused by the proposed project (i.e. 3%) by the subject activity. Maximum/ number of people said that there is no pollution caused by the subject project while some people said that water pollution (i.e.8%) and little bit odor (i.e.2%) caused by the subject activity.

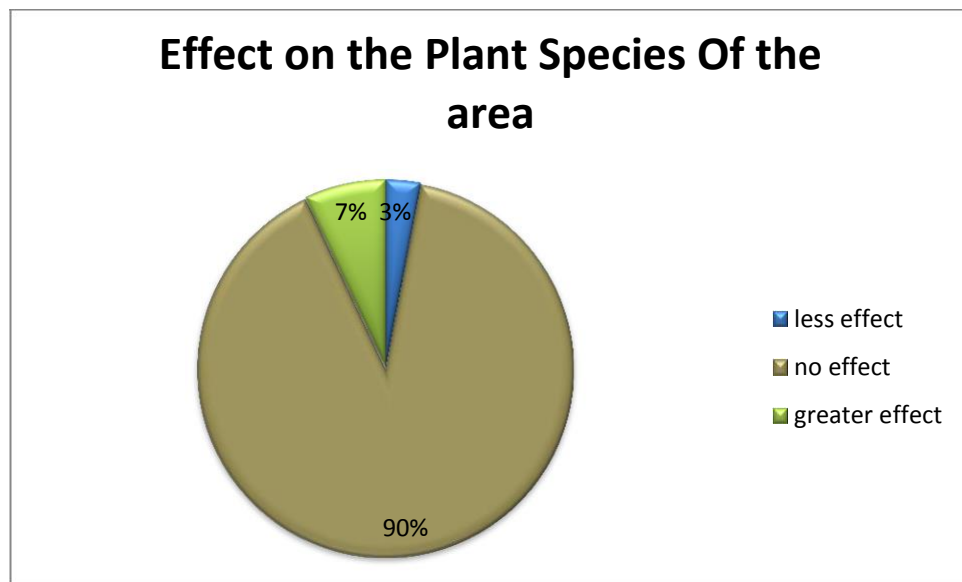


Figure 11: Effect of proposed project on flora

Discussion:

As above graph indicates, 90% of the respondents remarked that there is no effect caused on the plants species by the construction and operation of the proposed project, 7% said that there is greater effect can cause on the plants species by the subject activity by clearing the plants at the time of construction and 3% said that less impact will be cause by the subject project on the plants species.



Chapter # 7

CONCLUSIONS & RECOMMENDATIONS

Based on the study conducted for Environmental Impact Assessment (EIA) for the subject project, the following conclusions are made:

CONCLUSIONS

- The EIA study reveals that the project is economically viable, socially acceptable and environment friendly.
- The proponent will implement the project in the environment friendly manner.
- Project proponent will adopt the proper solid waste management system.
- Proponent will adopt all the necessary measures to control any impact if resulting from the project.
- Project proponent will provide the safe drinking water to all workers and staff.
- It will generate additional jobs during construction and operation phases.
- Project proponent of M/S Geo Links Pvt. Ltd has prepared and implemented very comprehensive Emergency Preparedness and Response Standard Operating Procedures.
- The proponent has committed to adopt proper waste management system and implement the project in the environment friendly manner and adopt every possible measure to control any impacts resulting from the subject project.
- Project proponent has prepared and implemented very comprehensive Security and Fire Fighting Standards Operating Procedures.
- The impacts of Installation of incinerator plant in area will be insignificant, provided the generic mitigation measures proposed in this report are implemented. In areas where



proposed site may have a significant impact, additional mitigation measures are given to reduce impacts to as low as reasonably possible.

Main environmental issues are as under:

- Production of Solid Waste/Ash
- Gaseous emissions
- Generation particulate matters
- Generation of noise

The present site meets all the requirements of a safe, spacious, clean and environment.

RECOMMENDATIONS

- In view of the comprehensive screening process and findings of the present study there is no need of conducting further investigations.
- Tree plantation inside and near the project area is recommended.
- Devices will be installed for reduction of Stack emissions.
- Ash generated from incinerator will be disposed of carefully in the nearest side
- Handling and storage of solid waste will be in sound manner.
- The management of M/s Geo Links Pvt. Ltd will continue to assist the local communities as a corporate/social responsibility (CSR).
- Any seepage and leakage will be control through proper mitigation measures
- Sound proof room should be constructed for generator to control the sound of it.
- Use of narcotics and smoking must be prohibited during working, filling or handling of fuel.
- PPEs must be provided to workers such as gloves, masks, etc.
- Proper solid waste management system must be adopted
- Safety signs, safety board's etc. must be placed on site during various developmental stages.
- Machinery will be never is left in running condition.



- First Aid measures, health & safety Equipment (PPEs) will be provided to workers.
- Fire Fighting station & system will be installed.
- The management of subject project will assist the local communities as a corporate/social responsibility.
- Jobs and employment will be provided to the local area

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

