Haryana State Pollution Control Board
C-11, Sector-6, Panchkula
Website – www.hspcb.gov.in **E-Mail** - hspcb.ho@gmail.com
HSPCB **Tele No. – 0172-2577870-73**

HSPCB/SWM/2022/ I/137259 **dated** 12/10/2022

To

The Director General,
Information, Public Relations
& Cultural Affairs Department,
Haryana, Chandigarh.

Sub: Public hearing for the project of Fractional Distillation Plant of Petroleum Crude and Mixed Hydrocarbons (12000 KL/Annum) at KH No 18/23, 45/52 Kila No. 12/2, 12/1 M20/1, 19/1, 19/2, 19/3 Village- Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana-122107 of M/s Prayagraj Impex LLP Haryana.

I have been directed to enclose herewith an advertisement regarding Public Hearing notice to be held on 28.11.2022 at 11:00 AM. in respect of Environment Clearance and conducting of Public Hearing of project of Fractional Distillation Plant of Petroleum Crude and Mixed Hydrocarbons (12000 KL/Annum) at KH No 18/23, 45/52 Kila No. 12/2, 12/1 M20/1, 19/1, 19/2, 19/3 Village- Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana-122107 of M/s Prayagraj Impex LLP Haryana for publication in the following leading newspapers on DAVP rates:-

1. One major national daily newspaper.
2. One Regional Vernacular daily Newspaper in Hindi.

This advertisement should appear on or before **15.10.2022** in the above said two newspapers only and bills of above two newspapers on DAVP rates may be sent to this office at the earliest, the bill payment of above said notice will be made for two newspaper only.
DA/Advertisement

Sr. Env Engineer (HQ)
For Member Secretary

CC: HSPCB/137259 Dated: 12/10/2022

A copy of the above is forwarded to the following for information and necessary action:-

1. Deputy Commissioner, Nuh.
2. The Chairman, Zila Parishad, District, Nuh.
3. Municipal Council / Corporation District, Nuh for display on Notice Board.
4. District Development and Panchayat Officer, Nuh
5. Deputy Director, District Industries Centre, Nuh.

DA/Advertisement.

Sr. Env. Engineer (HQ)
For Member Secretary

CC: HSPCB/137259 Dated: 12/10/2022

A copy of the above is forwarded to the following alongwith copy of EIA report and Executive Summary and CD for sending the same to the concerned authorities mentioned above to place the same in their offices for consultation of the general public during office hours:-

1. Regional Officer, Haryana State Pollution Control Board, Shed No. 1, Roz ka Meo Industrial Estate District- Nuh (Mewat)-122103.
2. M/s Prayagraj impex LLP at KH No 18/23.45/52 Kila No. 12/2, 12/1 M,20/1, 19/1, 19/2, 19/3 Village- Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana
3. Sr. EE (IT) to ensure that the notice is uploaded on the website of the Board.

DA/Advertisement.

Sr. Env. Engineer (HQ)
For Member Secretary

CC HSPCB/137259 Dated: 12/10/2022.

A copy of the above is forwarded to the following for information please:-

1. The Additional Chief Secretary to Govt. Haryana, Environment & Climate Change Department, Haryana Chandigarh.
2. The Director General, Environment & Climate Change Department, Haryana.
3. PS to Chairman / PA to Member Secretary.

DA/Advertisement

Sr. Env. Engineer (HQ)
For Member Secretary

HARYANA STATE POLLUTION CONTROL BOARD
C-11, SECTOR-6, PANCHKULA
Website – www.hspcb.gov.in E-Mail - hspcbho@gmail.com
Tele Fax No. – 0172-2577870-73

Notice For Public Hearing

It is for the information of all concerned regarding conducting of the Public Hearing for proposed project of Fractional Distillation Plant of Petroleum Crude and Mixed Hydrocarbons (12000 KL/Annum) at KH No 18/23, 45/52 Kila No. 12/2, 12/1 M20/1, 19/1, 19/2, 19/3 Village- Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana-122107 of M/s Prayagraj Impex LLP. This project is covered under the ambit of Environment Impact Assessment Notification dated 14th Sep, 06 issued by the Ministry of Environment, Forest and Climate Change Department, GOI, thus required to obtain Environmental Clearance. The detail of unit/project, date, time & venue of Public Hearing is given as under:-

Sr. No.	Name of the Unit	Date of Public Hearing	Time of Public Hearing	Venue of Public Hearing
1.	M/s Prayagraj Impex LLP at KH No 18/23, 45/52 Kila No. 12/2, 12/1 M20/1, 19/1, 19/2, 19/3 Village- Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana	28.11.2022	11.00 A.M	Primary Health Centre, Ghasera, District-Nuh (Mewat)

As a part of procedure for seeking the Environmental clearance, notified by the Ministry of Environment, Forest & Climate Change Department, Govt. of India, New Delhi vide Notification No. S.O. 1533 (E), dated 14.9.06, the project proponent mentioned above have applied to the Haryana State Pollution Control Board, **for conducting a Public Hearing so as to obtain views, suggestions and objections, if any, of the nearby Public on the proposed project. Copies of Executive summary of the project and EIA study report, submitted by the project proponent, are available in the following offices, which can be perused during office hours,** on any working day: -

1. Deputy Commissioner, Nuh.
2. Regional Officer, Haryana State Pollution Control Board, Shed No. 1, Roz ka Meo Industrial Estate District- Nuh (Mewat)-122103.
3. O/o Chairman, Zila Parishad, Nuh.
4. O/o Commissioner, Municipal Council, Nuh.
5. District Development and Panchayat Officer, Nuh.
6. Deputy Director, District Industries Centre, Nuh.

Notice is hereby given to all concerned, to file suggestions, views, comments and objections, if any, on the proposed project, to the Chairman, Haryana State Pollution Control Board, C-11, Sector -6, Panchkula as well as Regional Officer, Haryana State Pollution Control Board, Shed No. 1, Roz ka Meo Industrial Estate District- Nuh (Mewat)-122103 within 30 days of the publication of this notice. Besides, a Public Hearing will also be held on the date, time & Venue mentioned above **at the proposed site** of the project, which can be attended by any person including bonafide residents, Environmental groups and others located at the project site / sites of displacement / sites likely to be affected. Oral/Written suggestions, if any can also be made during the Public Hearing.

No TA/DA will be admissible for attending the Public Hearing.

Pardeep Kumar, IAS
Member Secretary

KEEP HARYANA CLEAN AND POLLUTION FREE

2287076/2022/Estt.Br

GSTIN- 06ABAFP7931J1Z2 CONTACT.NO- 9818935110

Prayagraj Impex LLP

Village – Sugarpur, Tehsil – Nuh, Dist – Nuh (HR)
E-mail: prayagrajimpexllp@gmail.com

DATE- ----------

To,

Date: 10/08/2022

The Member Secretary,
Haryana State Pollution Control Board (HSPCB),
C- 11 Sector 6, Panchkula,
Haryana

Subject: Submission of Draft EIA for conducting the Public Hearing of proposed project of Fractional Distillation Plant of Petroleum Crude and Mixed Hydrocarbons (12000 KL/ Annum) at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107

Ref.:ToR Letter No: No. IA-J-11011/180/2022-IA-II(I) Dated: 01 June 2022

Dear Sir,

With reference to the above cited subject, online application (Form 1 and PFR) along with the necessary annexure for the approval of To R has been submitted to Mo EF&CC. Accordingly, Standard Term of Reference was granted by Mo EF&CC on To R Letter No: No. IA-J-11011/180/2022-IA-II(I) Dated: 01 June 2022. Environment Baseline Monitoring has been conducted between 1st March -2022 to 31st May-2022 (Pre-Monsoon Season) and Draft EIA Report has been prepared for conducting public hearing as per the EIA Notification, 2006 & its amendment till date.

We are here with submitting the Draft EIA report both in hard copy as well as in soft copy as below:

1. Draft EIA/EMP Report along with necessary annexure (Hard & Soft Copy).
2. Executive Summary of the report in English and Hindi.

We are enclosing the requisite fees prescribed for conducting the public hearing by Haryana State Pollution Control Board under Notification No. S.O. 1533 (E) dated 14.09.2006 issued

for Prayagraj Impex LLP

Authorised Signatory

2287076/2022/Estt.Br

by Ministry of Environment and Forest, Govt. of India Under Environment (Protection) Act, 1986 of **Rs. 50,000** for conducting public hearing in favour of ***"Member Secretary,* Haryana State Pollution Control Board, *payable at Panchkula" through bank draft*** 535572 ***dated*** 17/8/22 ***from*** ..... Canara ..... ***Bank***.

Hope you will find this in order. We kindly request you to process expeditiously our application
for conducting the public hearing.

Thanking you.

For **PRAYAGRAJ IMPEX LLP**

For Prayagraj Impex LLP
Vijay
Authorised Signatory
(AUTHORIZED SIGNATORY)

COPY TO-

1- **Department of Environment & Forest & Climate Change, Govt of Haryana**

2- **Nodal Officer, District Collector, Nuh**

3- **Regional Officer, Haryana Pollution Control Board, Nuh**

4- **District Industries Centre (DIC) Nuh**

5- **Urban Local Bodies /Development Authority, Nuh**

6- **DFO Nuh**

7- **Sarpanch Village Panchayat.**

3

NAGPUR BUSINESS FORMS/CTS -2010

सोहाना - 122 103
SOHANA - 122 103 (4166)

यह लिखत जारी करने की तारीख से तीन महीने तक वैध है।
Valid for three months only from the date of instrument

CB 17082022

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एच OT	9
दह TT	8
एला OL	7
दला TL	6
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मांगने पर On Demand Pay MEMBER SECRETARY HARYANA STATE POLLUTION CONTROL BOARD

को या उनके आदेश पर Or Order प्राप्त मूल्य के लिए

रूपये Rupees FIFTY THOUSAND ONLY

अदा करें For Value Received ₹ ***50,000.00

Purchaser Name: * PRAYAGRAJ JMPEX LLP

केनरा बैंक Canara Bank ******NOT OVER Rs.50,000.00 कृते केनरा बैंक For Canara Bank

NEW DELHI ACCOUNTS SECTION(1745)
CTDN E
DRAWEE BRANCH D.H.CODE

प्राधिकृत हस्ताक्षर कर्ता AUTHO SIGNATORY नाम NAME पदनाम DESIGNATION ह.अ.सं. S.P. No.

अमित कुमार मंडल
AMIT KUMAR MANDAL
अधिकारी / OFFICER
ह.अ.सं. / S.P. No. 75006

₹ एक लाख और उससे अधिक डीमांड ड्राफ्ट के लिए दो प्राधिकृत हस्ताक्षरकर्ता की हस्ताक्षर चाहिए।
Demand Drafts of ₹ 1 Lakh and above require signature of two authorised signatories.
Please sign above

⑈535572⑈ 000015000⑆ 451166⑈ 16

2287076/2022/Estt.Br

Draft Report

ENVIRONMENTAL IMPACT ASSESSMENT

For

PROPOSED PROJECT OF DISTILLATION FACILITY FOR 12000 KL/ANNUM FRACTIONAL DISTILLATION OF PETROLEUM CRUDE & MIXTURE OF HYDROCARBONS

AT

Khata No. 18/23,45/52

KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3,

Village – Sugarpur, Tehsil-Nuh,

District-Nuh (Mewat), Haryana – 122107

Plot Area: 6500 sq. m.

Production Capacity: 12000 KL/Annum

Project Cost: 200 Lakhs

[ToR Letter No: No. IA-J-11011/180/2022-IA-II(I) Dated: 01 June 2022]
[Study Period: 1st March, 2022 to 31st May, 2022]

[Schedule 5(e), Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)
Category –"A" as per EIA Notification 2006 and its amendment time to time]

APPLICANT	ENVIRONMENTAL CONSULTANT
PRYAGRAJ IMPEX LLP Registered Office C/21, Shivaji Park Punjabi Bagh, New Delhi, North East, Delhi,110026, India **E-mail:** prayagrajimpex108@gmail.com **Tel No: 9818935110**	ECO CHEM SALES & SERVICES Ashoka Pavilion, New Civil Road, Surat (QCI/NABET Accreditation # NABET/EIA/2023/RA 0181) E-mail: eco@ecoshripad.com **Contact No.: 9909968953**

2287076/2022/Estt.Br

PRAYAGRAJ IMPEX LLP

C/21, Shivaji Park Punjabi Bagh, New Delhi, North East, Delhi,110026, India

To,

Member Secretary, IA Division

Government of Indla
Ministry of Environment, Forests and Climate Change
Indira Paryavaran Bhavan, Allganj
Jor Bag Road, New Delhi – 110003

Sub: Undertaking letter for ownership of Draft EIA/EMP and other documents for our greenfield project of Fractional Distillation Plant of Petroleum Crude and Mixed Hydrocarbons (12000 KL/ Annum) at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107.

Ref: ToR Letter No: No. IA-J-11011/180/2022-IA-II(I) Dated: 01 June 2022

Dear Sir,

We hereby give you an undertaking for owing the contents and information provided in EIA/ EMP report submitted to EAC Ind-2 for Environmental Clearance for setting up of 12000 Kl/Annum Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107, District-Nuh (Mewat), Haryana.

Your Sincerely

For **PRAYAGRAJ IMPEX LLP**

For Prayagraj Impex LLP

Vijay

(AUTHORIZED SIGNATORY)

ABBREVIATIONS

1. APCD- Air Pollution Control Devices
2. ToR- Terms of References
3. EC- Environmental Clearance
4. EMP - Environmental Management Plan
5. EMS - Environmental Management System
6. EMC- Environmental Management Cell
7. KLA- Kilo Litres per annum
8. HSEB- Haryana State Electricity Board
9. LDO- Light Diesel Oil
10. FO- Furnace Oil
11. GDP- Gross Domestic Product
12. HSD - High Speed Diesel Oil
13. KLD- Kilo Liter per day
14. MoEF&CC - Ministry of Environment, Forests and Climate change
15. TPM –Ton per month
16. PH – Public Hearing
17. PM- Particulate matter
18. PPE – Personal Protective Equipment
19. TPA- Tonnes Per Annum
20. MTO- Mineral Turpentine Oil

EXECUTIVE SUMMARY

1. Project Name and location:

Name: Proposed project of Distillation Facility of 12000 Kl/Annum Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons

Location: KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107.

2. Products:

Name of Products	CAS	Chemical Formula
Acetone	67-64-1	C3H6O
Toluene	108-88-3	C6H5CH3
Xylene	1330-20-7	C8H10
Mineral Turpentine Oil (MTO)	8006-64-2	C10H16
Hydrocarbon C-5-C-9	64742-95-6	C9--
Light diesel Oil (LDO)	68476-30-2	-
Fuel Oil (FO)	68476-33.5	-

3. Requirement of Land, Raw Material, Water, Fuel, and Source of Supply

Components	Quantity	Source of Supply
Land	6500 m^2	Leased
Fresh Water	2 KL	Ground Water
Raw Material	Petroleum Crude	Local market
Power	180 KVA	HSEB
Fuel - LDO & HSD	LDO-3.25 KLD HSD- 20 l/hr	Local Market

4. Process Description in brief, specifically indication the gaseous emission, liquid effluent and solid/hazardous waste

Process description is given in Chapter 2

Gaseous Emission: Flue gas Emission from proposed utility operations such as Steam Boiler and D.G. set. LDO and HSD will be used as a fuel. The significant pollutants identified due to flue gas emissions are/will be PM, NOx and SO_2 and CO.

Liquid Effluent: There is no liquid effluent is envisaged as water reused back to process, hence proposed project is Zero Liquid Discharge (ZLD) unit.

Solid and Hazardous Waste After proposed expansion

- Used Oil: 0.2 TPA
- Fly Ash: 50 TPA
- Poly Bag: 1 TPA

5. Measures for mitigating the impact on the environment and mode of discharge or disposal

- No wastewater from construction site will be allowed to dispose of on land. Adequate

sanitation facilities for labours will be provided. RCC construction septic tank walls followedby soak pit system along with adequate liner system will be provided.

- Regular monitoring/ checking/ inspection of the sewage networksystem treated water will be reused back to process, hence proposed project is Zero Liquid Discharge (ZLD) unit.

- All the solid/hazardous wastes to be generated at the end of manufacturing process or wastetreatment process will be stored on impervious floor having roof, boundary wall and leachate collection as well as transfer facility. Management of wastes shall be done as per Hazardous and other waste (Management and Trans-boundary Movement), Rules 2016 of Environment Protection Act, 1986.

6. Capital Cost of the Project, Estimated time of completion

- The total project cost after expansion is **Rs. 2 Crores**.
- It is estimated that Implementation of project will be completed within 12 months, considering EC obtainedday as a 1st day of implementation

7. Site selected for the project

- Leased land,
- Status of is acquisition- Acquired
- No population/habitation at site.

S.No.	Particulars	Description	Distance & Direction
1.	**Latitude and Longitude of the site**	Latitude- 28.123767º Longitude- 77.082495º	---
2.	**Nearest Village**	Sugarpur (Revenue Village but not human settlement) Ghasera	Ghasera- approx. 0.65 km
3.	**Nearest City**	Nuh	Approximately 5 km
4.	**Nearest District**	Mewat	Approximately 14 km
5.	**Nearest Highway**	248A	At a distance of 1.76 km W
6.	**Nearest Railway station**	Palwal Railway Station	Is at around 25.67 km ESE
7.	**Nearest Airport**	Delhi International Airport	At approximately 46 km N
8.	**State, National boundaries**	Inter State Boundary Rajasthan and Haryana	At a distance of 12.61 km

9.	**Nearest Water body**	None	In 5 km Radius
10.	**Archaeological site**	None	In 10 km Radius
11.	**National Park/ Wildlife sanctuary/ Marine sanctuary/ Reserve Forest**	None	In 10 km Radius
12.	**Nearest Industry**	Plyboard industry	On main road at a distance of 350 m
		Tyre Pyrolysis industry	At a distance of 400 m

8. **Baseline environmental data – Air quality, Surface and Ground water quality, Soil characteristic,Flora and Fauna, Socio-Economic condition of the nearby population**

Summary of Baseline Status Details

S. No.	**Parameters**	**Baseline Status**
1.	**Ambient Air Quality**	**(µg/m³)**
i.	PM_{10}	79.42-94.13
ii.	$PM_{2.5}$	39.66-53.96
iii.	SO_2	11.89-14.52
iv.	NO_2	21.04-24.73
v.	CO	0.57-0.81
All results have been found within the NAAQ Standard Limit		
2.	**Noise Level Monitoring**	**(dB(A))**
i.	Day Time (06:00 AM to 10:00 PM)	46.1-57.4
ii.	Night Time (10:00 PM to06:00 AM)	35.4-48.1
The observed noise levels are meeting the acceptable norms		
3.	**Soil Quality and Characteristics**	**(mg/kg)**
i.	pH	7.11-7.51
ii.	Organic Matter (%)	0.61-1.56
iii.	Total Nitrogen (%)	0.063-0.09

S. No.	Parameters	Baseline Status
iv.	Total Phosphorous	51.65-77.86
v.	Available Calcium	3205.41-4549.55
vi.	Available Magnesium	389.18-577.45
4.	**Ground Water**	**(mg/L)**
i.	pH	7.98-8.31
ii.	TDS	1411-1786
iii.	Total Hardness	403-760
iv.	Total Alkalinity	213-512
5.	**Surface Water**	**(mg/L)**
i.	pH	7.36-8.16
ii.	TDS	251-435
iii.	DO	7.4
iv.	BOD	8- 10.30

9. Identification of hazardous in handling processing and storage of hazardous material and safetysystem provided to mitigate the risk

After identifying hazards in handling processing and storage of hazardous material both Qualitative and Quantitative risk has been analyzed. Mitigation measures like periodical training on fire drill and using SCBA, conducting emergency response drill on yearly basis, training drivers for transportation of hazardous goods, providing fire extinguishers etc.

10. Likely impact of the project on Air, Water, Land, Flora-fauna nearby population

Looking to the overall project justification, process, pollution potential and pollution prevention measures/technologies installed by proponent, environmental management activities of proponent; it has been concluded that the proposed project would not have any considerable impacts on environment as well as socio-economic and ecological conditions of the project area

11. Emergency preparedness plan in case of natural or in plant emergencies

On- Site and Off- Site emergency plan has been prepared by including Safety committee along with their roles and responsibilities, mutual aids arrangements, roles and responsibilities of stake holders including stake holders, etc.

12. Issues raised during public hearing (if applicable) and response given

Public hearing issues will be added in final EIA report.

13. Occupational Health Measures

- Personnel protective equipment such as safety shoes, safety goggles, hand gloves, gum boots, safety helmet, and breathing apparatus set kit will be given to all workers and staff. Additional PPEs will be readily available at the workplace.
- Medical surveillance for the workers working in risk zone is/will be carried out regularly.
- Safety awareness programs will be conducted.

14. Post Project Environmental Monitoring Program

S. No.		Particular	Parameter for Monitoring	Frequency of Monitoring
1.		**Air Quality**		
	i.	Ambient Air Quality Monitoring within Plant premises	$PM_{2.5}$, PM_{10}, SO_2, NO_x	Monthly
	ii.	Stack Monitoring (Thermic Fluid Heater, Process Emission)	PM, SO_2, NO_x, VOC	Monthly
2.		**Water Quality** (Ground and Surface)	As per IS 10500:2012	Six monthly
3.		**Wastewater Quality**	As per consent conditions	Monthly
4.		**Noise Quality**		
	a.	Within plant premises at identified locations	Leq Levels	Monthly
	b.	Plant premises at least 5 locations	Day and night time Leq levels	Once in a quarter
5.		**Soil Quality**	Routine Physical and chemical parameters, Organic matter, Moisture content, Chloride ions, Phosphorous, Nitrates, Sulfates and Cations (Al, Fe, Mg, Na, Ca, K)	Six monthly
6.		**Work Zone monitoring**	RSPM, VOC	Monthly

S. No.		Particular	Parameter for Monitoring	Frequency of Monitoring
7.		**Solid/Hazardous waste generation**	Records of quantity of generation, handling, storage and transportation (disposal) of solid and hazardous waste will be maintained.	
8.		**Occupational Health Checkup**	Pre-employment and periodical health checkup for eye test, lung test, hearing capacity, skin test, step test *etc.* of every employee at least once in six months.	
9.		**Greenbelt Development**	Number of plantation (Units), Number of Survived Plants/ Trees, Number of Poor plant/ Trees	Once in a year
10.		**Consents and Authorization**	Consent to operate under applicable acts	Renewing 90 days before expiry of validity
11.		**Compliance of EC conditions**	Submission of 6 monthly compliance reports	June and December

Monitoring of the above parameters will be carried out to assess the performance of pollution control equipment installed to achieve the statutory norms. In case emissions/pollutant will found to exceed the norms, the 'on duty' personnel will check the relevant parameters and take appropriate corrective actions with EMC.

COMPLIANCES TO TERMS OF REFERENCES

ToR Letter No: No.IA-J-11011/180/2022-IA-II(I) Dated: 01 June 2022 under Schedule 5(e), Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes) Category "A" for setting up of **12000 KL/Annum Fractional Distillation Of Petroleum Crude & Mixture of Hydrocarbons** at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107Pin– 122107, District-Nuh (Mewat), Haryana by M/s Prayagraj Impex LLP.

<table>
<tr><th>S. No.</th><th>Terms of Reference (ToR) Points</th><th>Reply</th><th>Citation</th></tr>
<tr><td></td><td colspan="3">GENERIC TERMS OF REFERENCE</td></tr>
<tr><td>1.</td><td>Executive Summary</td><td>An executive summary provided in standard format before chapter 1 of this EIA report.</td><td>iv-xi.</td></tr>
<tr><td rowspan="3">2.</td><td colspan="3">Introduction</td></tr>
<tr><td>Details of the EIA Consultant including NABET accreditation</td><td>EIA has been prepared by NABET Accredited consultant M/s Eco Chem Sales & Services (Accreditation # NABET/EIA/2023/RA 0181)</td><td>Chapter 12</td></tr>
<tr><td>Information about the project proponent</td><td>M/s Prayagraj Impex LLP is promoted by three partners viz. Mr. Vijay Kumar, Mr. Satya Prakash Gupta and Mr. Vinod Kumar Garg</td><td>Chapter 1 (Section 1.3 Sub section 1.3.2; Page No. 2)</td></tr>
<tr><td rowspan="4">3.</td><td colspan="3">Project Description</td></tr>
<tr><td>Cost of project and time of completion.</td><td>Project Cost: INR 200 Lakh.
The time of the completion for the proposed project will be 1 year after grant of all pre requite approval.</td><td>Chapter 2 (Section 2.4; Page No. 24)</td></tr>
<tr><td>Products with capacities for the proposed project. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.</td><td>Fraction Distillation of petroleum crude and mixture of Hydrocarbons for 12,000 KL/annum as feedstock. The final products after distillation will be:
<table><tr><th>Name of Products</th><th>CAS</th><th>Chemical Formula</th></tr><tr><td>Acetone</td><td>67-64-1</td><td>C3H6O</td></tr><tr><td>Toluene</td><td>108-88-3</td><td>C6H5CH3</td></tr><tr><td>Xylene</td><td>1330-20-7</td><td>C8H10</td></tr><tr><td>Mineral Turpentine Oil (MTO)</td><td>8006-64-2</td><td>C10H16</td></tr><tr><td>Hydrocarbon C-5-C-9</td><td>64742-95-6</td><td>C9–</td></tr><tr><td>Light diesel Oil (LDO)</td><td>68476-30-2</td><td>-</td></tr><tr><td>Fuel Oil (FO)</td><td>68476-33.5</td><td>-</td></tr></table>The current project is of green field of fraction distillation of petroleum crude and mixture of Hydrocarbons for 12,000 KL/annum as feedstock.</td><td>Chapter 2 (Section 2.6; Page No. 29)</td></tr>
<tr><td>List of raw materials required and their source along with mode of transportation.</td><td>The Major raw material is Petroleum crude and mixture of hydrocarbon which is available within 100 km also, the finished products will be sold to nearby users within 100 km.</td><td>Chapter 2 (Section 2.4; Page No. 27)</td></tr>
</table>

	Other chemicals and materials required with quantities and storage capacities	The raw material is explosive hence, PESO and Non-PESO area has been demarcated separately.	Chapter 2 (Section 2.11; Page No 30-31)
	Details of Emission, effluents, hazardous waste generation and their management. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract).	There will be no discharge of wastewater from the plant as Zero liquid discharge (ZLD) will be adopted for the liquid effluent discharge. There will not be any generation of hazardous waste. Total Water requirement for the proposed project will be 2 KLD water is required. Source of the water will be Ground Water. Total requirement of power for the unit is 180 kVA. The total power demand of the plant will be met from HSEB. Total manpower required is 15.	Chapter 2 (Section 2.7 and 2.4 respectively ; Page No.35,26-27)
	Process description along with major equipment's and machineries, process flow sheet (quantitative) from raw material to products to be provided.	Process description of production of Acetone, Toluene, Xylene, Mineral Turpentine Oil (MTO), Hydrocarbon [C-5 to C-9], Light diesel Oil (LDO) and Fuel Oil (FO) along with schematic diagram are incorporated in EIA report.	Process Description & process flow chart: Chapter 2 (Section 2.6; Page No.27-28). Major Equipment Details: Annexure-31-34
	Hazard identification and details of proposed safety systems.	Hazard analysis involves the identification and quantification of the various hazards (unsafe condition) that will be expected during operation of unit. On the other hand, risk analysis deals with the identification and quantification of the risk, the plant equipment and Personnel are exposed to due to accidents resulting from the hazards present in the plant. Risk analysis involves the identification and assessment of risks to the population who are exposed to as a result of hazards present. This requires an assessment of failure probability credible accident scenario, vulnerability of population etc. Much of this information is difficult to get or generate consequently, the risk analysis in present case is confined to maximum credible accident studies and safety and risk aspect related to proposed production. Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.	Chapter 7 (Section 7.3; Page No.147-150)
	Expansion/modernization proposals:		

	Copy of all the Environmental Clearance(s)including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing existing operation of the project from SPCB shall be attached with the EIA-EMP report.	Not applicable as the project is greenfield project and on industrial land.	Ch 2
	In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.	Not applicable	Chapter 2
4.	Site Details		
	Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.	The project site is at proposed site is situated at KH. No. 18/23,45/52; KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3; Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat), Haryana – 122107. *Justification for selecting the site*: 1. The total number of trees present within the plant boundary is near to 20 only in case of site 1 which is less in comparison to other alternate	Location of the project: Chapter 1 (Section 1; Sub section 1.3.1; Page No. 1) Justification for selecting the site: Chapter 1 (Section 1.7;Page

		sites. And only 2 are coming in alignment which is to be transplanted to green belt. 2. The ground water available in safe zone. 3. Well Connectivity with project site. 4. Maximum area available in contagious land. 5. National Highway is 1.65 km distance. 6. No water body within 5 km radius 7. No any forest within 5 km radius.	No. 7) & Chapter 5 (Section 5.2;Page No. 136)
	A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (Including all eco-sensitive areas and environmentally sensitive places).	Toposheet No. 53H4 on 1:50,000 scale was utilized to draw the study area for baseline data collection including all eco-sensitive areas and environmentally sensitive places. ➢ Nearest Village- Ghasera at 0.65 km ➢ Nearest Highway-248A at a distance of 1.76 km ➢ Nearest Interstate Boundary- Interstate boundary of Rajasthan and Haryana at a distance of 12.61 km ➢ Nearest railway Station- Palwal Railway Station 25.67 km ESE ➢ Nearest River- No Water body within 5 km radius ➢ Nearest Forest- No forest Within 5 km radius ➢ Nearest National Park/Protected Forest/ Biosphere Reserve- None in the 10 km radius.	Chapter 2 (Section 2.2 ;Sub section 2.2.1; Figure 2.1 to 2.3; Page No.9-10)
	Co-ordinates (lat-long) of all four corners of the site. Google map-Earth downloaded of the project site. Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location	<table><tr><th>#</th><th>Latitude</th><th>Longitude</th></tr><tr><td>1</td><td>28° 7'26.10"N</td><td>77° 4'56.66"E</td></tr><tr><td>2</td><td>28° 7'22.91"N</td><td>77° 4'56.78"E</td></tr><tr><td>3</td><td>28° 7'23.03"N</td><td>77° 4'53.40"E</td></tr><tr><td>4</td><td>28° 7'24.65"N</td><td>77° 4'53.39"E</td></tr><tr><td>5</td><td>28° 7'25.43"N</td><td>77° 4'53.87"E</td></tr><tr><td>6</td><td>28° 7'25.38"N</td><td>77° 4'55.57"E</td></tr></table>	Chapter 2 (Section 2.2; Sub section 2.2.1; Figure 2.1 to 2.3; Page No. 9,10) figure 2.5 layout map page no. 26

	of unit within the Industrial area/Estate.	Google imaginary of project site downloaded from Google earth is given along with Layout maps indicating storage area, plant area, greenbelt area, utilities etc. The project is located outside notified industrial area.	
	Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.	Photographs of the proposed site has been provided with GPS coordinates, date & time.	Chapter 2
	Land-use break-up of total land of the project site (identified and acquired), government/ private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)	The project site is private land (non-forest) have been taken on lease for the distillation of hydrocarbon. The land is having NA for industrial purpose.	Chapter-2 (Section 2.4; Sub section 2.4.2; Page No. 25)
	A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area	There are 3 industries present in the within study area. Map showing Location of these 3 industries on toposheet is attached with EIA report. Land use details of study area has been provided in chapter 3.	Map is enclosed as Annexure: XII Chapter-3 (Section 3.8; Sub section 3.8.1-3.8.5; Page No. 55-59)
	Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)	The project site is free of any water bodies. Map of 5 km and 10 km radius area around the project site showing the drainage has been prepared showing stream order and its shows no any major water body within 5 km radius. The Flood Level of the project site is not available with district official in the last 30 years as there is no evidence of flood in last 30 years.	Chapter 3
	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.	The Land is on lease in the name of M/s Prayagraj Impex LLP. Land documents are attached with EIA report.	Chapter 2
	R&R details in respect of land in line with state Government policy	Not Applicable	--

5.	Forest and wildlife related issues (if applicable):		
	Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)	Not Applicable, as Forest Land is not involved.	--
	Land use map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (in case of projects involving forest land more than 40 ha)	The project area and about 10 km radius of the project area encompassing a total area of 0.65 ha comes under Mewat District of Haryana. There is no forest land involved in the project area. The land use Map of 10 km radius has been prepared on the basis on satellite imagery and it shown majorly agricultural land in the vicinity.	Chapter - 3, Figure No - 3.14, Page No – 66.
	Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.	Not Applicable.	
	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon.	There is no national park, Wildlife sanctuary or wildlife corridors & reserve forest present in the study area of the proposed project. Eco-Sensitive Map is given in Chapter-2.	Chapter – 2 Figure No – 2.3, Page No. 24.
	Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area.	Not required, As Schedule I species are not found within the Study area.	--
	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife	Not applicable. There is no Wildlife sanctuary or wildlife corridors present in the study area of the proposed project.	--
6)	Environmental Status		
	Determination of atmospheric inversion level at the project site and site-specific micrometeorological data using temperature, relative humidity,	During the study period minimum temperature was recorded 19 Deg C and maximum temperature was recorded as 45 Deg. C. Temperature data were collected on hourly basis	Chapter-3 (Section 3.5; Sub section

	hourly wind speed and direction and rainfall.	during the study period. Humidity Maximum recorded as 84 % and minimum Humidity was recorded as 02 %. Average Wind Speed during study period is 21 km/h	3.5.1; Page No.45)
	AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.	8 ambient air quality-monitoring stations were located in the impact area during summer season 2022 (March 2022 - May-2022). Standard procedures and frequency prescribed by CPCB were used. The monitoring stations are selected based on the pre-dominant wind direction, population zone and sensitive receptors including reserved forests. Environmental Monitoring Map is also given in EIA report.	Chapter-3 (Section 3.6 ; Sub section 3.6.1; Page No. 48
	Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with - min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.	Air quality at the project site ambient air quality analysis was conducted at the project site by weekly for three months from March 2022 -May-2022. Summary of Air Monitoring Results are as- PM2.5 was observed in the range of 37.12-42.04 µg/m3. Maximum concentration of PM2.5 was found at Ghasera Village. PM10 was observed in the range of 76.43-81.67 µg/m3. Maximum concentration of PM10 was found at village-Manki. SO2 concentration was observed in the range of 9.65-16.38 µg/m3, which is well within the standard limit. NOx concentration in was observed in the range of 19.14-27.41 µg/m3, which is well within the standard limit. CO concentration was observed it is well within the standard limit. Min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations are also given in Chapter-3.	Chapter 3
	Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.	There are 2 surface water points having water in study area. Analysis results of surface water reveal the following; ➢ TDS analysis was also carried out for surface water sample and it was found in the range of 251-435 mg/L.	Chapter-3

		➢ TSS was found in the range of 21-48 mg/L. ➢ Total Hardness ranges from 176-212 mg/L with maximum in the water sample of Bainsi village and minimum Ghasera village. Details given in Chapter-3.	
	Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details	Not Applicable	--
	Ground water monitoring at minimum at 8 locations shall be included	Ground water monitoring at minimum at 8 locations has been discussed in the report Analysis results of ground water reveal the following: pH was observed in the range of 7.98-8.20 which meets with desirable norms. Total dissolved solid was recorded in the range of 1411-1786 mg/L with minimum at Chappera village and maximum at project site borewell. Total hardness was in the range of 397-760 mg/L with minimum at Adulka Village and maximum at Chachera Village Total Alkalinity was found in the range of 213-512 mg/L with minimum at Adulka Village and maximum at Chachera Village Chlorides was found in the range of 76.2-410 mg/L	Chapter-3 (Section 3.11; Sub section 3.11.4; Page No.65-66
	Noise levels monitoring at 8 locations within the study area.	Noise levels were measured using integrated sound level meter at 8 locations.	Chapter-3 (Section 3.7; Sub section 3..7.2; Page No.53&
	Soil Characteristic as per CPCB guidelines	Soil Characteristic as per CPCB guidelines has been discussed in the report	Chapter-3 (Section 3.10; Sub section 3.10.1; Page No. 62-63)
	Traffic study of the area, type of vehicles, frequency of vehicles	Traffic study has been conducted for existing scenario and impact	Chapter 3 & 4.

	for transportation of materials, additional traffic due to proposed project, parking arrangement etc.	assessment for proposed scenario has been done.	
	Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished	An ecological study was carried out during study period and details are incorporated in EIA Report. No schedule -I species were recorded from study area. National Parks, Wildlife Sanctuary and any Eco-sensitive zone are not present within the 10 km radius in buffer zone.	Chapter-3 (Section 3.12; Sub section 3.12.1; Page No. 76-77)
	Socio-economic status of the study area	Detailed Socio-economic status of the study area is given in Chapter-3.	Chapter-3
7)	Impact and Environment Management Plan		
	Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.	AERMOD Cloud V18.3 is used for Dispersion Model to predict the Assessment of ground level concentration of pollutants from the proposed Project. The meteorological data was collected from nearby IMD station Delhi. Isopleths showing dispersion of pollutants are given in Chapter-4.	Chapter-4 (Section 4.3; Sub section 4.3.2; Page No.120)
	Water Quality modelling - in case of discharge in water body	The proposed project has adopted "Zero liquid effluent Discharge (ZLD)". Hence, no impact on surface and groundwater quality.	Chapter-2, section-2.4.2, 2.4.3 and 2.4.6 at Page No. 27- 29.
	Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes	The project site is connected to MDR and then to State highway 134 at only 400 m and NH 248A at a distance of 1.76 km (W). The existing road are catering to average density of traffic and that expected incremental increase in road traffic due to the proposed project.	Chapter – 3, section No-3.9, Table 3-12, 3-13 at Page No-60

	(large quantities) by rail or rail-cum road transport or conveyor cum-rail transport shall be examined.	Hence, there will not be any significant changes on the traffic load situation at project site.	
	A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules	There will be no industrial wastewater discharge as the plant will be designed on zero effluent discharge principle. Septic tanks followed by soak pits will be provided for sewage treatment and disposal.	Chapter 2 (Section 2.7; Sub section 2.7.1; Page No. 35).
	Details of stack emission and action plan for control of emissions to meet standards.	Stack details and other emission source details are given in Chapter-2. The GLC prediction has been done and observed that the air quality to be within the NAAQS standards.	Chapter 2 Chapter-4 (Section 4.3;Sub section 4.3.2; Page No. 121)
	Measures for fugitive emission control	Trucks carrying raw material are closed tankers to any spillage and regular water sprinkling will be done to avoid spreading of dust during transportation. Greenbelt and greenery development around storage yards, around plants, either side of roads and around the periphery of the industry. Water spray and sprinkling is practiced at unpaved locations. All internal roads in the premise are paved/ tarred. Speed limit of 10 km/h is enforced for vehicles in the plant premises to prevent road dust emission. Regular sweeping of roads is practiced with vacuum sweeping machine or water flushing to minimize dust. The air pollution control measures will ensure the ambient air quality to be within the NAAQS standards for industrial areas as indicated below.	Chapter-4 (Section 4.3; Sub section 4.3.2; Page No. 122)
	Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also	Details of hazardous waste generation and their storage, utilization and management have been discussed in the report. Facility has dedicated storage yard for Haz. Waste generated from process &	Chapter-2 (Section: 2.7; Sub section: 2.7.3; Page No. 37)

	be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation	all haz. waste will be disposed to authorized CHWTSDF recognized by HSPCB. Copy of MOU regarding utilization of solid and hazardous waste. The concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation have been discussed in the EMP.	Chapter-10
	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.	Not applicable	-
	Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated	Green belt will be developed over 33% area of the total plant area out of the 2145 sq m. of the plant area. This greenbelt will serve as a buffer between the peripheries and the industry, there by controlling the air emissions and noise levels. There are 20 trees at site of approx. 7-15 years of age, that will be protected /retained as green belt and 2 trees which is coming under alignment those will be transplanted to green belt area. Additionally, nearly 322 trees and 200 shrubs species will be planted in vacant area. Required protection, manure, water will be provided for survival. Separate person will be appointed to look after the green belt development and maintenance. Local forest department/horticulture department will be consulted for selection of plant species for green belt development. A budget of Rs. 1, 35,500 has been kept for Green belt development. No. of required trees = 2500/Ha = 2500*0.2145= 536 No. of trees = 542 trees	Chapter-10 (Section: 10.4.3; Page No. 221)
	Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh	The rainwater storage structures will be provided as per contour map inside the plant premises, where rainwater will be collected. The collected rain water will be utilized in dust suppression, green belt and other purposes within premises.	Chapter 10 sub section 10.9.2 page no. 230

	water and reduce the water requirement from other sources.		
8)	Occupational health		
	Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers	Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers have been provided in the report. Rs. 0.5 Lakhs has been allocated to OHS.	Chapter-10 (Section: 10.5; Page No.224226)
	Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre-placement and periodical examinations give the details of the same. Details regarding last month analyzed data of above-mentioned parameters as per age, sex, duration of exposure and department wise	Workers' health shall be evaluated by pre designed format, for chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision. color vision and any other ocular defect) ECG, during pre-placement and periodical examinations that will give the details of the same.	Chapter 7
	Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved	Not Applicable	Chapter-7 (Section: 7.6; Page No. 209)
	Annual report of health status of workers with special reference to Occupational Health and Safety	Agreed	-
9)	Corporate Environment Policy		
	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report	Yes, The Company has a well-defined policy to keep the Environment clean and green. The company has decided that all effective steps shall be taken to ensure that flow of information from working level to top level should flow in a smooth and coordinated manner, so that in case any deficiency is noted, it is brought to the notice of top management and preventive and corrective action is initiated in a systematic manner.	Chapter-10 (Section: 10.11; Page No.231-232)
	Does the Environment Policy prescribe for standard operating	Yes, the details are incorporated in EIA report.	Chapter-10

	process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.		
	What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given	The details of hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions has been placed and provided in EIA report.	Chapter 10
	Does the company have system of reporting of non-compliances/ violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report	The Procedure for reporting the mechanism of Non-compliance is being followed by the company.	Chapter 10
10)	Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.	All civil worker is appointed by nearby vicinity so no need of residential restroom to construction worker, however facility provide them RO cooler for drinking water, canteen facility for lunch and breakfast.	Chapter 10
11)	Enterprise Social Commitment (ESC)		
	Adequate funds (at least 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon.	The details of CER activities have been discussed in the report. However, the funds will be utilized as per the issues raised during public hearing as per OM of 30th Sept. 2021.	Chapter-10 (Section: 10.4; Page No. 131)
12)	Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to	No litigation pending against company	---

	the notice(s) and present status of the case.		
13)	'A tabular chart with index for point wise compliance of above TOR	Complied	--
	Specific Conditions		
1.	Details on requirement of raw material, its source of supply and storage at the plant.	The major raw material are Petroleum crude and mixture of hydrocarbon which is available within 100 km, the detail has been incorporated.	Chapter-2
2.	Complete process flow diagram for all products with material balance.	The process flow diagram with material balance has been provided. Details of process emissions from the proposed unit and its arrangement to control the emission are also given.	Chapter-2
3.	Details on requirement of auxiliary chemicals, solvents, catalysts, reactors and utilities to support the unit processes	The list of all chemicals, solvents storage, utilities has been provided which supports to fraction distillation.	Chapter-2 (Section 2.6; page no. 29-34
4.	Brief description of equipment for various process.	The equipment for all the process has been provided.	Chapter 2
5.	Details of proposed source-specific pollution control schemes and equipment to meet the national standards.	The source specific emission like VOC and HC has been identified and LDAR has been proposed. The effluent treatment scheme including segregation of effluent streams for units adopting 'Zero' liquid discharge has been discussed in the report.	Chapter 2 (Section 2.7; Sub section 2.7.1; Page No.35-39).
6.	Details on VOC emission control system from vents, stacks, fugitive emissions and flare management, etc.	Action plan for VOC emission control includes: VOC detector to be installed, Odor Control for Solid Handling Odor Control for Liquid Handling Common Practices to control any odor form the plant.	Chapter-10 (Section: 10.4; Page No. 220-221)
7.	Details on proposed LDAR protocol	LDAR protocol has been prepared and provided in EIA report.	Chapter 4
8.	Ambient air quality should include total hydrocarbon, methane and non-methane hydrocarbon & VOC and VCM (if applicable).	Ambient air quality data including VOC, other process-specific pollutants like Non-methane HC, VCM etc have been discussed in the report	Chapter 3
9.	Risk Assessment & Disaster Management Plan	Material Safety Data Sheet for all the Chemicals/products are being handled has been attached with this report.	Chapter 7
i	Identification of hazards		Chapter 7
ii	Consequence Analysis		

iii	Measures for mitigation of risk	The all-possible hazards have been identified and mitigation measures has been provided with 3 D risk analysis.	

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1 INTRODUCTION

1.1 PRELUDE

The chemical industry needs solvents and FO (as fuel) in India and is witnessing a structural change and companies are realigning their strategies and consolidating themselves to face stiff competition from global companies. The high speed of economic reforms and a GDP growth, there are bright prospects for the chemical industry and specialty chemicals strives to be a part of this growth by keeping itself updated with the state-of the-art technologies for its portfolio of products. The proposed project is of distillation of petroleum crude and mixture of hydrocarbon to get solvent and FO which is being utilized by most of the chemical, API, speciality chemical industries.

1.2 PURPOSE OF THE REPORT

Purpose of the report is:

- To identify environmental aspects and impacts arising out of the project.
- To propose EMP Report & Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control as per the standard ToR letter issued on 1st June, 2022 vide No. No. IA-J-11011/180/2022-IA-II(I). A copy of ToR is enclosed as Annexure-1.

The EIA report is prepared based on Generic Structure of EIA Document' as per EIA Notification 2006.

The main objectives of the study are-

Ensure that environmental considerations are explicitly addressed and incorporated into the development of decision-making process. Predict and avoid, reduce or compensate for the negative biophysical, social and other impacts related to development proposals. Protect the productivity and capacity of natural systems and the ecological processes which maintain their functions. Promote sustainable development and improve resource use and management skills. To review the current environmental status of the study area within 10 km radius of the project site by collecting the baseline data on the environmental attributes including air, noise, water, land, ecological and socio-economic environments during March 2022 to May 2022.

1.3 IDENTIFICATION OF THE PROJECT & PROJECT PROPONENT

1.3.1 Identification of Project

M/S Prayagraj Impex LLP is proposed a greenfield project of 12000 KL/Annum Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons

Project site Location: at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107

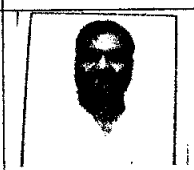
Registered Address: M/s Prayagraj impex have their registered office in C/21, Shivaji Park Punjabi Bagh, New Delhi, North East, Delhi,110026, India.

Table 11-1: Identification of the project as per EIA Notification

Project or Activity	Category	Product
12000 KL/Annum Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons	A	Acetone, Toluene, Xylene, MTO, LDO, Aromatic Hydrocarbons of C-5 to C-9

1.3.2 Project Proponent

There are three promoters for this proposed plant, given below-

Name of Promoters	Photo	Experience
Mr. Vijay Kumar		He has more than 15 years of experience in industrial operation and stone crushing units.
Mr. Satya Prakash Gupta		He has more than 5 years of experience in industrial operation and tire recycling plant.
Mr. Vinod Kumar Garg		He has more than 20 years of experience in industrial operation, oil trading, e-rikshaw manufacturing.

1.4 PROJECT DESCRIPTION

1.4.1 Nature, Size and Location of the Project

The brief description of the project is given in ***Table 11-2.***

Table 11-2: Brief Description of the Project

S. No.	Details	Description
1	Nature	Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons Falls under Schedule 5 (e), Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes), Cat A. There were no pending litigations against the project and/or no direction/ no order passed by any Court of Law against the project, not received any notice under the

		Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Act.
2	Product	Acetone, Toluene, Xylene, MTO, LDO, Aromatic Hydrocarbon of C-5 to C-9
3	Size	Total plot Area-6500 m^2 Production Capacity-12000 KL/annum
4	Water	2 KLD
5	Location	KH. No. 18/23, 5/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107
6	Cost of the project	2 Cr

1.4.2 Importance to the Country and the Region

Chemical industry is one of the oldest industries in India, which contributes significantly towards industrial and economic growth of the nation. Since this industry has numerous forward and backward linkages, it is called the backbone of the industrial and healthcare development of the country and provides building blocks for many downstream industries. The products manufactured will be sold both in domestic & export markets. The export market will earn foreign currency for the country.

Generate direct and indirect local employment: Unit will generate skilled, semi-skilled and un-skilled workers from the local area on requirement basis. Total manpower is required to operate this unit is 15 Nos.

Continuous development by R&D, providing growth and technological advancements in the field. This will support the technical and mechanical supply chain of the industry.

The project will add to the local, state and national tax collection, enlarging the base of the state and central exchequer. Feed stock heavy Aromatics / Mixture of Hydrocarbons Petroleum Crude available from the market resources in regular basis. The facility is proposed with distillation process to separate different value-added products market for finished material is observed as good Petroleum refining has evolved continuously in response to changing consumer demand for better and different products.

1.5 REGULATORY FRAMEWORK

S.No.	Activity	Aspect	Legal Regulation
1	• Manufacturing • Thermic Fluid Heater • Air Compressor • Cooling Tower	• Gaseous Emission • Noise • Water Pollution • Accidents	• Factory License • The Factories Act, 1948 • The Water (Prevention and Control of Pollution) Act, 1974 and Rules, 1975, as amended to date.

			• The Water (Prevention and Control of Pollution) Cess Act, 1977 and Rules, 1978, as amended to date. • The Air (Prevention and Control of Pollution) Act, 1981 and Rules, 1982, as amended to date. • The Manufacture, Storage and Import of Hazardous Chemical rules, 1989, as amended to date. • The Bureau of Indian Standards Act. • The Custom Act, 1962 • E-waste (Management and Handling) Rules, 2011 as amended to date. • Indian Boiler Act and amendment 2015 • Environmental Impact Assessment Notification, 2006 As amendment till date • Consent to Establish and Operate • Environmental clearance
2	Storage of Product and Raw Material	• Dust Generation • Noise • Gaseous Emission • Accidents	• The Water (Prevention and Control of Pollution) Act, 1974 and Rules, 1975, as amended to date. • The Water (Prevention and Control of Pollution) Cess Act, 1977 and Rules, 1978, as amended to date. • The Air (Prevention and Control of Pollution) Act, 1981 and Rules, 1982, as amended to date. • The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, as amended to date. • The Explosive Act, 1884 and Rules, 1983 as amended to date. • The Petroleum Act, 1934 & Rules, 2002.

			• Chemical accidents (Emergency Planning, preparedness and Response
3	Transportation of Raw Material and products	• Dust Generation • Noise • Gaseous Emission • Accidents	• Chemical accidents (Emergency Planning, preparedness and response) Rules, 1996. • The Motor Vehicles Act, 1988 & The Central Motor Vehicle rules, 1989. • The Air (Prevention and Control of Pollution) Act, 1981 and Rules, 1982, as amended to date. • The Environment (Protection) Act, 1986 and Rules, 1986, as amended to date. • The Noise Pollution (Regulation and Control) Rules, 2000 as amended to date.
4	Recruitment	Social	• Public Liability Insurance Act, 1991 and Rules, 1991 as amended to date • The Factories Act, 1948

1.6 SCOPING AND APPLICATION OF EC

Detailed EIA/EMP report has been prepared in line with approved ToR issued Government of India, Minister of Environment Forest and Climate Change vide no. by **No. IA-J-11011/180/2022-IA-II(I) on** 1st June, 2022. Impact Assessment Divisionand as per generic structure given in EIA notification – 2006. The EIA/EMP report includes collection of baseline data with respect to major environmental components, *viz.* Air, Noise, Water, Land, Biological and Socio-economic components for 3 months. The study area map covering 10 km radius of project site is given in Chapter – 3 of EIA report.

1.6.1 Structure of the Report

The entire EIA report is prepared based on the generic structure of EIA document given at appendix - III of the Notification No. S.O. 1533 dated 14th September, 2006 at MoEFCC, New Delhi. The report has been divided into twelve chapters as described below:

S. No.	EIA Structure	Contents
1.	Introduction	▪ Purpose of the Report ▪ Identification of project and project proponent ▪ Brief description of nature, size, location of the project and its importance to the country, region ▪ Scope of the study – details of regulatory scoping carried out (As per terms of reference) ▪ Site Selection Criteria/Site History
2.	Project Description	Condensed description of those aspects of the project (based on project feasibility study), likely to cause environmental effects. Description contains the details of the following: ▪ Type of project ▪ Need for the project ▪ Location details showing general location, specific location, project boundary & project site layout ▪ Size or magnitude of operation ▪ Project description including drawings showing project layout, components of project *etc.* ▪ Proposed schedule for approval and implementation, ▪ Technology and process description, ▪ Schematic representations of the feasibility drawings which give information important for EIA purpose. ▪ Description of mitigation measures incorporated into the project to meet environmental standards, environmental operating conditions, or other EIA requirements
3.	Description of the Environment	▪ Study area, period, components & methodology, ▪ Establishment of baseline for valued environmental components, as identified in the scope. ▪ Study Period: March to May 2022 ▪ Base maps of all environmental components.
4.	Anticipated Environmental Impacts & Mitigation Measures	▪ Details of Investigated Environmental impacts due to project location, possible accidents, project design, project construction, regular operations. ▪ Measures for minimizing and / or offsetting adverse impacts identified. ▪ Irreversible and Irretrievable commitments of environmental components. ▪ Assessment of significance of impacts (Criteria for determining significance, Assigning significance), ▪ Impact scores and Mitigation measures ▪ Air modelling
5.	Analysis of Alternatives	In case, the scoping exercise results in need for alternatives: ▪ Description of each alternative ▪ Selection of alternative

S. No.	EIA Structure	Contents
	(Technology & Site)	
6.	Environmental Monitoring Program	▪ Technical aspects of environmental monitoring for the effectiveness of mitigation measures (including measurement methodologies, frequency, location, data analysis, reporting schedules, emergency procedures, detailed budget and procurement schedules)
7.	Additional Studies	▪ Public consultation ▪ Risk Assessment ▪ DMP ▪ Traffic management plan
8.	Project Benefits	▪ Improvements in physical infrastructure ▪ Improvements in social infrastructure ▪ Employment potential – Skilled; semi-skilled and unskilled ▪ Other tangible benefits of the project
9.	Environmental Cost Benefit Analysis	▪ Environmental cost, profitability, financial pattern, *etc.*
10.	Environment Management Plan	▪ Description of the administrative aspects of ensuring that mitigation measures are implemented and their effectiveness monitored, after approval of the EIA. ▪ Explanation of how, adverse effects have been ▪ Mitigated.
11.	Summary & Conclusion	▪ Overall justification for implementation of the project,
12.	Disclosure of Consultant Engaged	▪ The names of the Consultants engaged with their brief resume and nature of consultancy rendered.

1.7 SITE HISTORY

The existing site is already converted into industrial land and previously This site is taken on lease for 15 yrs (2021 to 2036) for fractional distillation of Petroleum Crude and mixed hydrocarbons with feedstock capacity of 12000 KL/year at Mouja- Sugarpur, Tehsil and Dist-Nuh and Site has 20 trees and 1 shade is available at project site.

1.8 SUMMARY

M/s Prayagraj Impex LLP is proposed a greenfield project of 12000 KL/Annum Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1,19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107. Falls under Schedule 5 (e), Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes), Cat A. There were no pending litigations against the project and/or no direction/ no order passed by any Court of

Law against the project, not received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Act. The entire EIA report is prepared based on the generic structure of EIA 2006. Detailed EIA/EMP report has been prepared in line with approved ToR vide no. by **No. IA-J-11011/180/2022-IA-II(I)** dtd. 1st June, 2022.

2. PROJECT DESCRIPTION

2.1 GENERAL

M/s Prayagraj Impex LLP is proposed a greenfield project of 12000 KL/Annum Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107. Falls under Schedule 5 (e), Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes), Cat A

2.2 PROJECT DESCRIPTION

The present proposal is to set up a manufacturing plant of Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons. The products are used in different Industry. Mostly Heavy Aromatics/ Petroleum Crude & Mixture of Hydrocarbons are used as Raw Material. Raw materials are proposed to derive the different products. Some of the key products to be distilled. The Project falls under Category A of Schedule 5(e) as per EIA notification and its amendments time to tome and will be appraised by MOEFCC, New Delhi.

2.2.1 Location, Type and Size of the Project

Project is located at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107. The location map showing project site is shown as Figure 2.1 Photograph of existing premises is shown as figure 2.4. The site layout map is presented as Figure 2.2. Topographic Site Map is Shown in Figure 2.3.

Specific Location Map with Project Boundary

Geographical location of the project site is Latitude: 28.123767º and Longitude: 77.082495º.

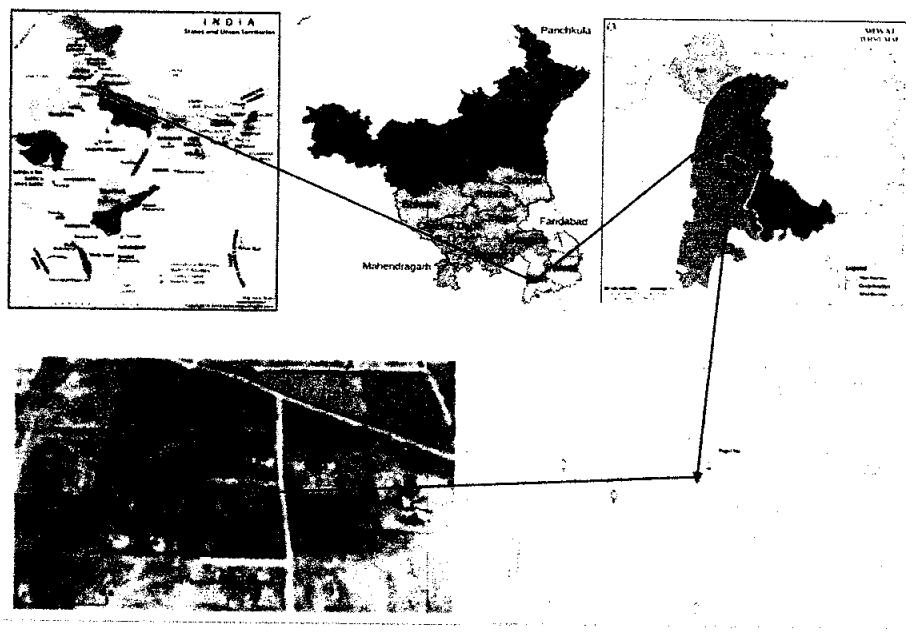


Figure 2-1: Location map

Figure 2-2: Short View of Project Site

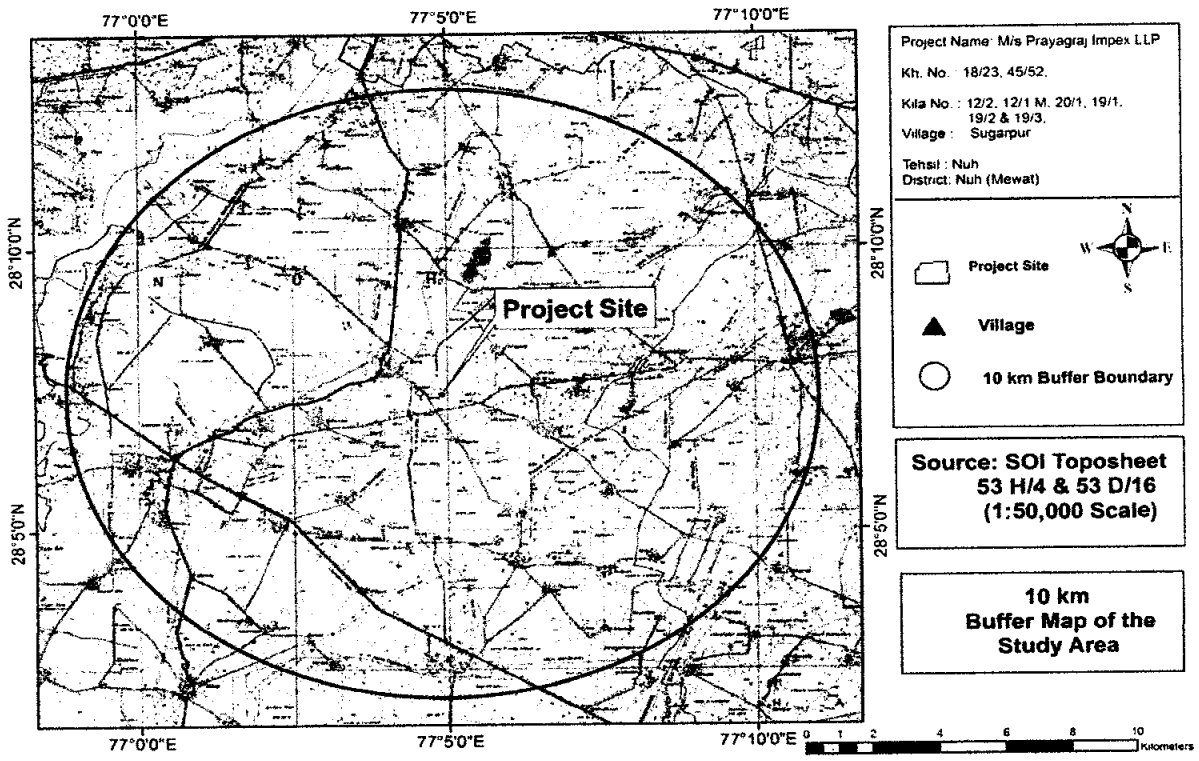
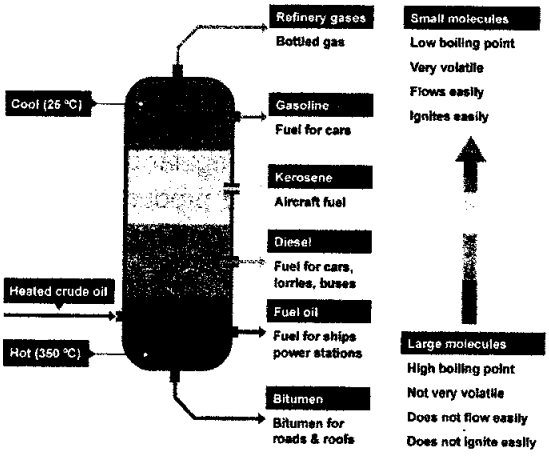


Figure 2-3: Long View of Project Site (10 km Radius)

Photograph 2.1: Picture of Existing Project Site

Type of Project

M/s Prayagraj Impex LLP is proposed a greenfield project of 12000 KL/Annum Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1,19/1,19/2,19/3 Village-Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107. Project site is about 6500 m^2 and well connected through air and Roadways. Wild life sanctuary and national parks are not found within 10 km radius from the project site. All basic and infrastructure facilities such as road, Power Station. Manpower is also easily available from nearby area.



Fractional distillation is used to separate crude oil into simpler, more useful fractions. A fraction of crude oil is a group of hydrocarbon molecules of similar size with similar boiling points. Their similar boiling points mean that they can be separated by fractional

distillation. The diagram below summarizes the main fractions from crude oil and their uses, and the trends in properties. Note that the gases leave at the top of the column, the liquids condense in the middle and the solids stay at the bottom.

Size of Project

The size of proposed distillation project is 12000 KL/annum as feedstock of crude petroleum.

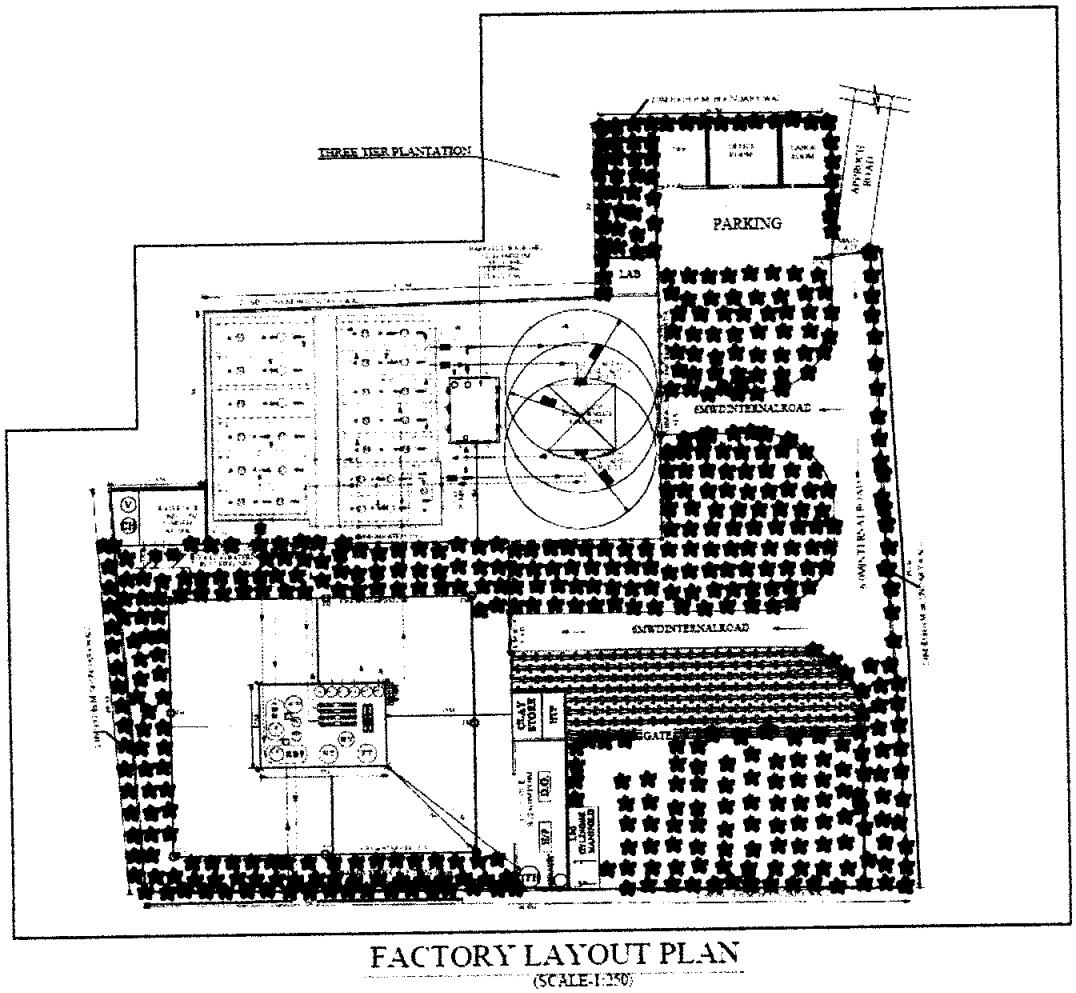


Figure 2.4: Plan Layout of the Project

2.3 NEED FOR THE PROJECT

Feed stock heavy Aromatics / Mixture of Hydrocarbons Petroleum Crude available from the market resources in regular basis. The facility is proposed with distillation process to separate different value-added products market for finished material is observed as good Petroleum refining has evolved continuously in response to changing consumer demand for better and different products.

2.3.1 Demand Supply Gap

The petroleum-based solvent has tremendous requirement in chemical industry. The global toluene market is expected to grow from $18.25 billion in 2020 to $18.45 billion in 2021 at a

compound annual growth rate (CAGR) of 1.1%. The market is expected to reach $16.92 billion in 2025 at a CAGR of -2%.

End Users of Petroleum based Solvent and other products

On the basis of End users, Toluene, Xylene, Acetone etc. market is classified into:

S.No.	Use of Solvents in Industry	S.No.	Use of Solvents in Industry
1.	Pharmaceuticals	2.	Dyes
3.	Additives	4.	Oilfield
5.	Laboratory Use	6.	Thinner
7.	Chemicals	8.	Corrosion Inhibitors
9.	Pesticide	10.	Automotive
11.	Detergents	12.	Motor Fuel
13.	Resins	14.	Adhesive
15.	Sealant	16.	Diluents
17.	Paints and Coatings	18.	Binding Agent

The cost of feedstock is considered to be the largest cost in the petrochemical industry. The estimated cost of feedstock to produce BTX accounts for 40-50% of total costs. Catalytic reforming represents the main source for aromatics, accounting for over half of the global production volume. Steam cracking of naphtha is the second main petrochemical source for aromatics. Thirdly, light oil (LDO) represents an emerging source for aromatics. The forecasts indicate a high rate of growth in demand for motor gasoline, high speed diesel oil, kerosene, liquid petroleum gas and aviation turbine fuel. However, the demand for fuel oils, light diesel oil, naphtha and lube oils is expected to grow at a relatively lower rate. To arrive at an optimal refinery process configuration, an analysis of alternative means of satisfying the demand, which include product import options and domestic refining options with alternative process configurations, need to be done.

Toluene

The emerging demand for aromatics in the petrochemical industry contributed to the growth of the toluene market. Aromatics are petroleum-derived forms of hydrocarbons, composed primarily of carbon and hydrogen elements. Toluene is a common aromatic, used as chemical feedstock's, solvents, and fuel additives in the chemical industry. To cater to the growing demand, companies are investing in expanding their production capacity. Fluctuations in crude oil prices have always been a major challenge in the toluene market as selected fractions of petroleum are used as raw material for producing toluene. Toluene prices are constantly changing owing to factors such as instability in the prices of crude oil and variations in demand and supply. For instance, in November 2019, crude oil prices increased by 0.86% per barrel in futures trade. This rise will increase the operating expense and thereby impact the growth of the toluene market.

The toluene market covered in this report is segmented by type into benzene and xylene, solvents, gasoline additives, TDI (toluene diisocyanate), trinitrotoluene, benzoic acid, and benzaldehyde. It is also segmented by production process into reformation process, pigs process, coke/coal process, styrene process, by end-use industry into building and construction, automotive, oil and gas, consumer appliances and by application into drugs, dyes, blending, cosmetic nail products, others (TNT, pesticides, and fertilizers). Toluene di-isocyanate is increasingly being used as raw materials in the manufacturing of flexible foam applications. Toluene di-isocyanate (TDI) is a chemical used in polyurethanes production, especially in flexible foam applications such as furniture, bedding and also in packaging applications.

Xylene

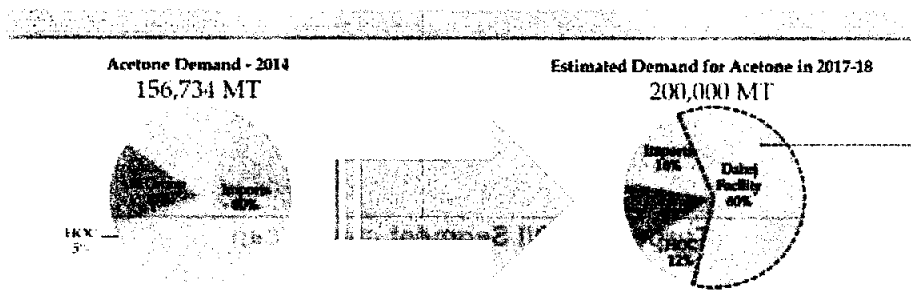
Rising xylene demand owing to increasing applications in major industries including leather and rubber especially in Asia Pacific and the Middle East are expected to drive the global xylene market over the forecast period. Shift in xylene manufacturing bases from Europe and North America to emerging economies of India and China owing to the availability of inexpensive labor is expected to fuel Asia Pacific market growth over the next six years. Furthermore, China is anticipated to be the major consumer for xylene on account of the growing demand for pesticides in the agricultural sector over the forecast period. Major applications of xylene include pure terephthalic acid (PTA) production; paint, dyes & pigments, and for laboratory use. North America and Europe are expected to witness below-average growth rates owing to a slowdown in end-use market demand for PET over the next six years. Xylene isomers can be segmented as o-xylene, p-xylene, and m-xylene for use in foams, adhesives, and films. Growing M&A and patent registrations by major industry players including Thai Oil Company, Shell, Reliance, and Bayer are poised to increase industry rivalry and entry barriers for market entrants. The development of new para-xylene complex by PetroChina Sichuan to produce over 600 MT per year is expected to reduce the demand-supply gap in China. In addition, technological development in para-xylene production process by SABIC is anticipated to create a competitive edge sustaining competition. Other xylene market participants include BASF, Flint Hills Resources, Dow Chemical, LG Chem. Ltd, LyondellBasell, The Ineos Group, DuPont, Lanxess, Formosa Plastics Group, ConocoPhillips, SINOPEC, JX Holdings, and CNPC.

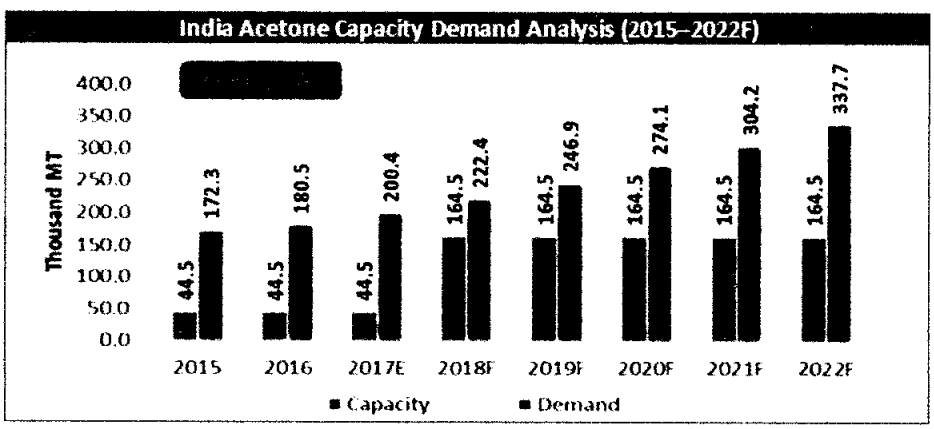
Acetone

Acetone demand stood at 7.44 million tons in 2020 and is forecast to reach 13.09 million tons by 2030, growing at a healthy CAGR of 5.60% until 2030. Acetone is a colorless, volatile, and versatile component that is widely used as a primary ingredient in various industries. The sudden outbreak of the global COVID-19 pandemic resulted in overwhelming demand for acetone at the beginning of the pandemic, driven by the rise in demand for hygienic products utilizing derivative Isopropyl Alcohol (IPA) as a prime feedstock. More than 95 percent of the total Acetone produced in the world comes as a by-product of Phenol so the low demand for the solvent as an outcome of temporary turnarounds in the automotive and construction sector compelled Phenol/ Acetone manufacturer to reduce their capacity utilization, which directly affected the acetone market. However, as COVID-19 started to affect the major end-user industries, such as cosmetics and personal care, paints and coatings, automobile industries, the decline in sales due to the pandemic effect weakened the demand for acetone for a short period. Furthermore, halt in automotive production, as well as construction activities, also reduced the demand for widely used industrial chemicals such as BPA and MMA during 2020. On the flip side, the rise in the demand for numerous drugs, medication, and sanitization products fueled the market growth of acetone.

The global Acetone market is divided into solvents, BPA, and Methyl Methacrylate (MMA Production of Acetone is largely achieved via cumene peroxidation followed by dehydrogenation of isopropanol and few other low scale processes). Market players anticipate healthy growth for Acetone during the forecast period as the industry prompts rising demand for derivative Isopropyl Alcohol, for the manufacturing of sanitizers and disinfectants. Demand

is anticipated to increase in the near future on account of rising awareness over hygiene and cleanliness, influenced by the ripple effects of coronavirus. To combat the surge in demand, leading global Acetone producers like INEOS and DOW chemicals are ramping up their production capacities and setting up new units of cumene to assist the world in tough times of the Pandemic. Moreover, companies engaged in the downstream utilization of Acetone products like BPA and MMA are eyeing to expand their business by several mergers and acquisitions, hence, creating immense scope for the growth of the global Acetone Market in the next ten years. Acetone Production is majorly concentrated in China, the USA, Taiwan, South Korea, and the western European region. Asia Pacific region witnessed an overwhelming growth for Acetone in 2020 and is further anticipated to contribute maximum consumption share in the forecast period owing to rapidly expanding pharmaceutical and electronics sectors. Moreover, the addition of Phenol/Acetone capacities in China in recent years will result in reduced dependency on imports and make it self-reliable. Furthermore, India is also expected to ramp up its domestic production in the coming years as it has imposed anti-dumping duties on Acetone imports from South Korea, Saudi Arabia, and China. Some of the major players operating in global Acetone market are Cepsa Corporation, Kumho shell, PTTGC., Formosa Chemicals and Fibre Corporation, Taiwan Prosperity Chemical Corp (TPCC)., Deepak Nitirite Ltd., LG Chem, Mitsui Chemicals Inc., DOW Chemicals, Sabic Innovative Plastics, Shell are some of the leading players operating in the Global Acetone market and others



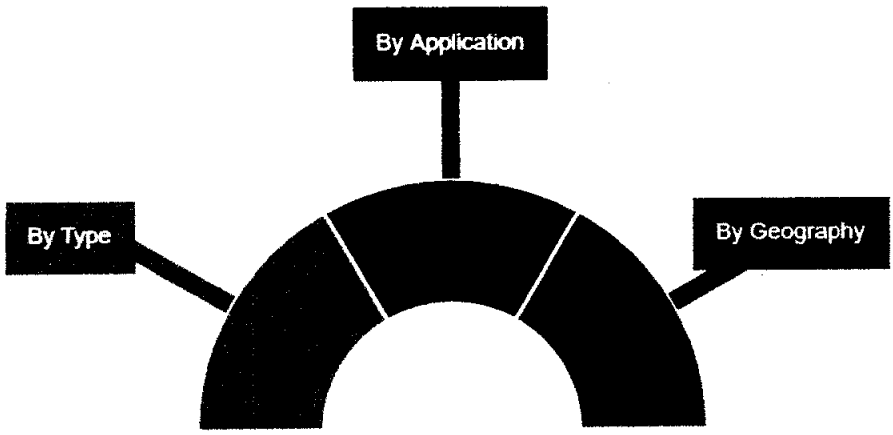


Source: Beroe Research

Turpentine Oil (MTO)

Turpentine Oil is used extensively in the medical industry and is applied to the skin for joint pain, nerve pain, muscle pain, and toothaches. Growth in the personal care industry and chemical industry boosting the demand for turpentine oil. Turpentine used in some paints and coatings. Today, less costly products have replaced the use of turpentine in paints. Now, the major use of turpentine is as a raw material for the chemical industry. It is also used for spray painting and pottery, ceramic coatings, artist's paints, and naval paints. Turpentine is and sometimes found in furniture and shoes polishes. The Turpentine Oil market study is being

classified, by Application (Paints & Inks, Camphor, Aromatic Chemicals, Adhesives and Others) and major geographies with country level break-up. Analysts at AMA predicts that Manufacturers from United States will contribute to the maximum growth of Global Turpentine Oil market throughout the predicted period. Arizona Chemical Company LLC (United States), Pine Chemical Group (Finland), International Flavours & Fragrances (United States), Mentha & Allied Products Pvt Limited (India), Lawter Inc. (United States), Les Derives Resiniques Et Terpeniqes SA (France), Harting Technology Group (Germany), Renessenz LLC. (United States) and Privi Organics Limited (India) are some of the key players profiled in the study. On the basis of geography, the market of Turpentine Oil has been segmented into South America (Brazil, Argentina, Rest of South America), Asia Pacific (China, Japan, India, South Korea, Taiwan, Australia, Rest of Asia-Pacific), Europe (Germany, France, Italy, United Kingdom, Netherlands, Rest of Europe), MEA (Middle East, Africa), North America (United States, Canada, Mexico).



Turpentine Oil Segment market cap

FO

Furnace oil is used to heat fuel trucks. It is much used as a backup fuel for peaking power plants. It is used to heat homes. It is utilized to produce steam for industrial uses. It is an integral part of generating electric energy. The emission from use of furnace oil is expected to contribute in respect of Sulphur Dioxide (SO2) and secondary sulphate component of particulate matter (PM). The total secondary sulphate particulates contribution in ambient PM10 concentration in Delhi is in the range of 4.5-15.3% during winter and 4.7-7 % during summer, while in case of PM2.5 it is 8-21% and 7.6-12.5% in winter and summer seasons, respectively.

Production and consumption of liquid fuels (mt)

Fuel		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18*
Naphtha	Consumption	12.29	11.31	11.08	13.27	13.24	9.20
	Production	18.85	18.51	17.47	17.86	19.72	13.30
HSD	Consumption	69.08	68.36	69.42	74.65	76.03	60.50
	Production	91.09	93.78	94.34	98.59	102.11	70.86
LDO	Consumption	0.40	0.39	0.37	0.41	0.45	0.37
	Production	0.40	0.42	0.35	0.43	0.63	0.30
FO and	Consumption	7.66	6.24	5.96	6.63	7.15	5.02
LSHS	Production	15.80	13.46	12.18	10.69	12.03	7.28

** Consumption figures for April-December; production figures for April-November.*

Source: Petroleum Planning and Analysis Cell

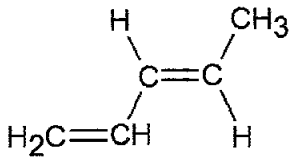
LDO

Light diesel oil, or LDO, is a blend of components from the distillation process of crude. It is used in engines with an rpm less than 750, such as boilers and furnaces. LDO is also referred to as distillate fuel or marked oil.

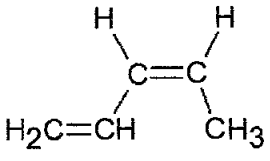
S.No.	Characteristics	Method of Test
i)	Acidity	Inorganic
ii)	Acidity, total mg of KOH/G, Max	-
iii)	Ash, percent by mass, Max	0.02
iv)	Carbon residue (Ramsbottom) on 10 percent residue, percent by mass, Max	1.5 (on whole sample)
v)	Cetane number, Min	-
vi)	Pour point, Max	12°C for winter and 21°C for summer
vii)	Copper strip corrosion for 3 h at 100°C	Not worse than No. 2
ix)	Pensky-Martens, °C, Min	66
x)	Kinematic viscosity, cSt, at 40° C	2.5 to 15.7
xi)	Sediments, percent by mass, Max	0.10
xii)	Density at 15°C, kg/m^2	To be reported
xiii)	Total sulphur, percent by mass, Max	1.8
xiv)	Water content, percent by volume, Max	0.25
xv)	Cold Filter Plugging Point (CFPP), Max	-
xvi)	Total sediments, mg per 100 mL, Max	-

C-5 TO C-9 (AROMATIC HYDROCARBONS)

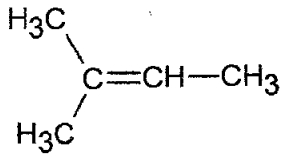
Aliphatic hydrocarbon resins (C5 Resins) are made from C5 piperylene and its derivatives. The most important ones are cis/trans 1,3-pentadienes, 2-methyl-2-butene, cyclopentene, cyclopentadiene, and dicyclopentadiene (see below). These monomers are polymerized to oligomeric resins with low to high softening point using Lewis's acid catalysts. C5 resins are aliphatic in nature and are, therefore, fully compatible with natural rubber, most olefins (LDPE) and many synthetic elastomers of low polarity. They are available in a wide range of molecular weights (MW) and softening points (solid grades 85 - 115°C and liquid grades 5 - 10°C) and provide outstanding tack. They also have a light yellow to light brown colour and possess excellent heat stability.



Trans-1,3-Pentadiene



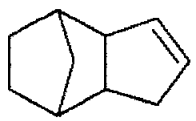
Cis-1,3-Pentadiene



2-Methyl-2-Butene

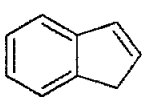
Cyclopentadiene

Cyclopentene

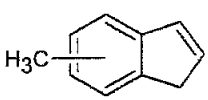


Dicyclopentadiene

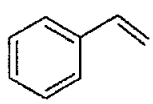
Aromatic hydrocarbon resins (C9 Resins) are made from C9 aromatic hydrocarbons. Their composition depends on the hydrocarbon feedstock (coal tar, crude oil). The most important base monomers are indene, methyindenes, dicyclopentadiene, styrene, alpha-methylstyrene and various vinyl toluenes. These resins are available in a wide range of softening points. Compared to C5 resins, they have a much higher melt viscosity, are of darker colour (dark yellow to brown)[2] and have higher softening point ranging from about 100 to 150°C.[3] C9 resins are very versatile resins that are compatible with many polymers.



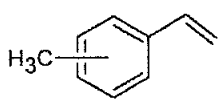
Indene



Methylindenes



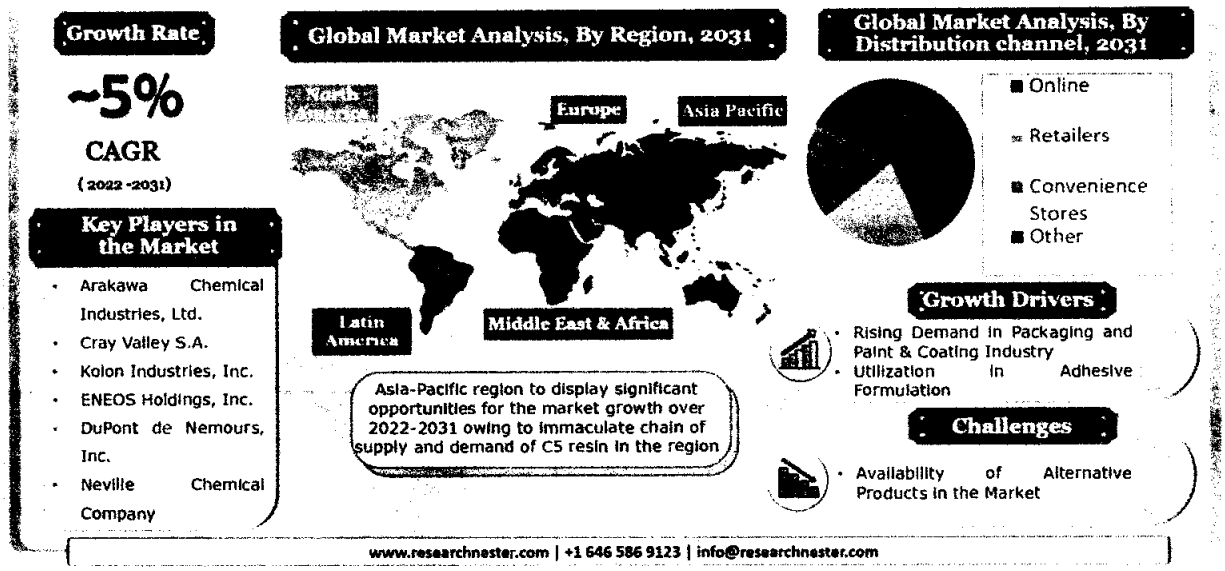
Styrene



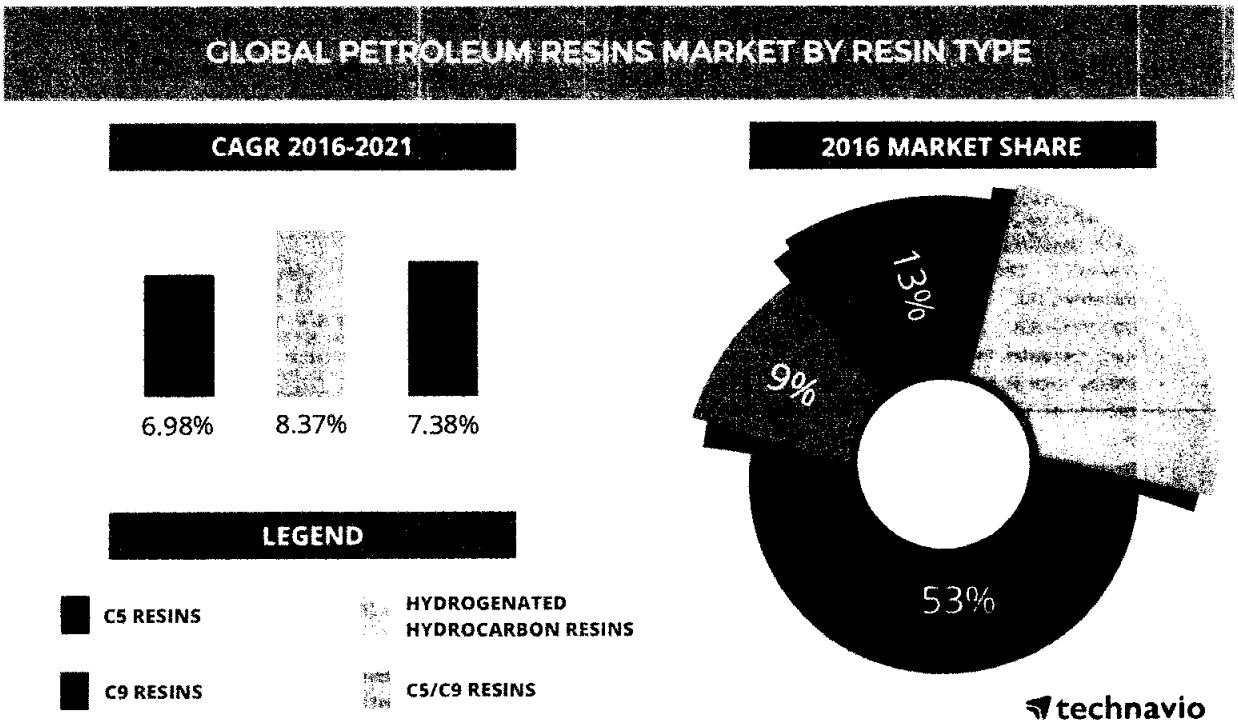
Methylstyrenes

Hydrogenated C5/C9 resins and resin blends are also commercially available. These resins are often colourless and have improved heat and colour stability. However, they are also noticeably more expensive and thus, only used if superior heat and colour stability is of concern.

Applications



Hydrocarbon resins are used as tackifiers, performance modifiers and homogenizing agents. They are extensively used in the manufacture of rubbers, coatings, printing inks, and adhesives. The largest market for hydrocarbon resins are hot melts, PSA tapes and labels. They are important ingredients in many rubbers' adhesive formulations, particularly synthetic rubbers that are less tacky than natural rubber. They improve tack, peel strength, and increase the glass transition temperature, which in turn improves shear strength. In paints, they provide superior pigment wetting, enhanced adhesion, gloss, and film hardness. They also improve flow and levelling, reduce VOCs and provide improved mildew and water resistance.



Global Petroleum Resin Market

2.3.2 Salient Features

The proposed site is taken on lease from 25.11.2021 to 24.11.2036 – for 15 years. The site is well connected to road, airport, railway. The proposed site is located in Rayati Gaon (revenue village) Sugarpur, however nearest human settlement is Ghasera at 650 m.

1	**Name of the Company**	M/s Prayagraj Impex LLP
2	**Registered office** **Plant and Admin Office**	**Registered Office** C/21, Shivaji Park Punjabi Bagh, New Delhi, North East, Delhi,110026, India **Plant And Admin Office** KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat), Haryana - 122107
3	**Name of Designated Partners**	Mr. Vijay Kumar, Mr. Satya Prakash Gupta Mr. Vinod Kumar Garg
4	**Proposed Sector**	Schedule 5 (e), Petrochemical based processing (processes other than cracking &

		reformation and not covered under the complexes), Cat A
5	**Area of Plant**	6500 m^2.
6	**Toposheet No.**	53H4
7	**Working Shift**	2 Shift
8	**Implementation period of Project**	12 Months
9	**Project Cost**	2 Cr
10	**Cost of EMP**	35 Lakhs
11	**Environment Officer**	M.Sc. Environment -1 No.
12	**Capacity**	12,000 KL / annum
13	**Water & Source**	2 KL, Ground water (Bore well)
14	**Power**	180 KVA
15	**Fuel**	HSD & LDO
16	**Air Emission**	Source: TFH and D.G. Set • PM: <150 mg/Nm^3 • SO_2: < 100 ppm • NOx: <50 ppm From Process Emission VOC: < 20 mg/Nm^3
17	**Solid/Haz.** **Waste Generation**	Used oil: 0.2 KLA Poly Bag – 1 TPA
18	**Wastewater**	No trade effluent

Table 2-1: Physical Environmental Setting in the Vicinity of the Site

S. No.	Particulars	Description	Distance & Direction
1.	**Latitude and Longitude of the site**	Latitude- 28.123767º Longitude-77.082495º	-
2.	**Nearest Village**	Sugarpur (Revenue Village but not human settlement) Ghasera	Ghasera- approx. 0.65 km
3.	**Nearest City**	Nuh	Approximately 5 km
4.	**Nearest District**	Mewat	Approximately 14 km
5.	**Nearest Highway**	248A	At a distance of 1.76 km W
6.	**Nearest Railway station**	Palwal Railway Station	Is at around 25.67 km ESE

7.	**Nearest Airport**	Delhi International Airport	At approximately 46 km N
8.	**State, National boundaries**	Inter State Boundary Rajasthan and Haryana	At a distance of 12.61 km
9.	**Nearest Water body**	None	In 5 km Radius
10.	**Archaeological site**	None	In 10 km Radius
11.	**National Park/ Wildlife sanctuary/ Marine sanctuary/ Reserve Forest**	None	In 10 km Radius
12.	**Nearest Industry**	Plyboard industry	On main road at a distance of 350 m
		Tyre Pyrolysis Unit	At a distance of 400 m

2.4 RESOURCE REQUIREMENT

2.4.1 Investment

The estimated proposed project cost for the proposed unit is 2 Cr (200 Lakhs). The land is leased in the name of M/s Prayagraj Impex LLP for 15 years

Table 2.2. Estimate of Project Cost

S. No.	Particulars	Cost (Lakhs)
1	Land	Leased
2	Land Developed & Building	10.00
3	Plant and Machineries	140
4	Environment protection measures (includes cost of APCD, Tree Plantation and Rain Water Harvesting etc.)	35.00
5	Others	15.00
Total		**200.00**

2.4.2 Land

Total land is 6500 Sq. m. this land is sufficient for the setup of the Green Field Fractional Distillation of Petroleum Crude project. 33.0% land has been earmarked for plantation and greenbelt as per standard norms. Table below gives the % area used in the plant. The tentative land area statement of proposed project is given as below

Table 2.3. Land Area Bifurcation

S.No.	Particular	Area (m^2)	Percentage
1	Plant area	2470	38
2	Utility	650	10
3	Green Belt	2145	33
4	Parking	975	15
5	Road & Others	260	4
	Total	**6500**	**100**

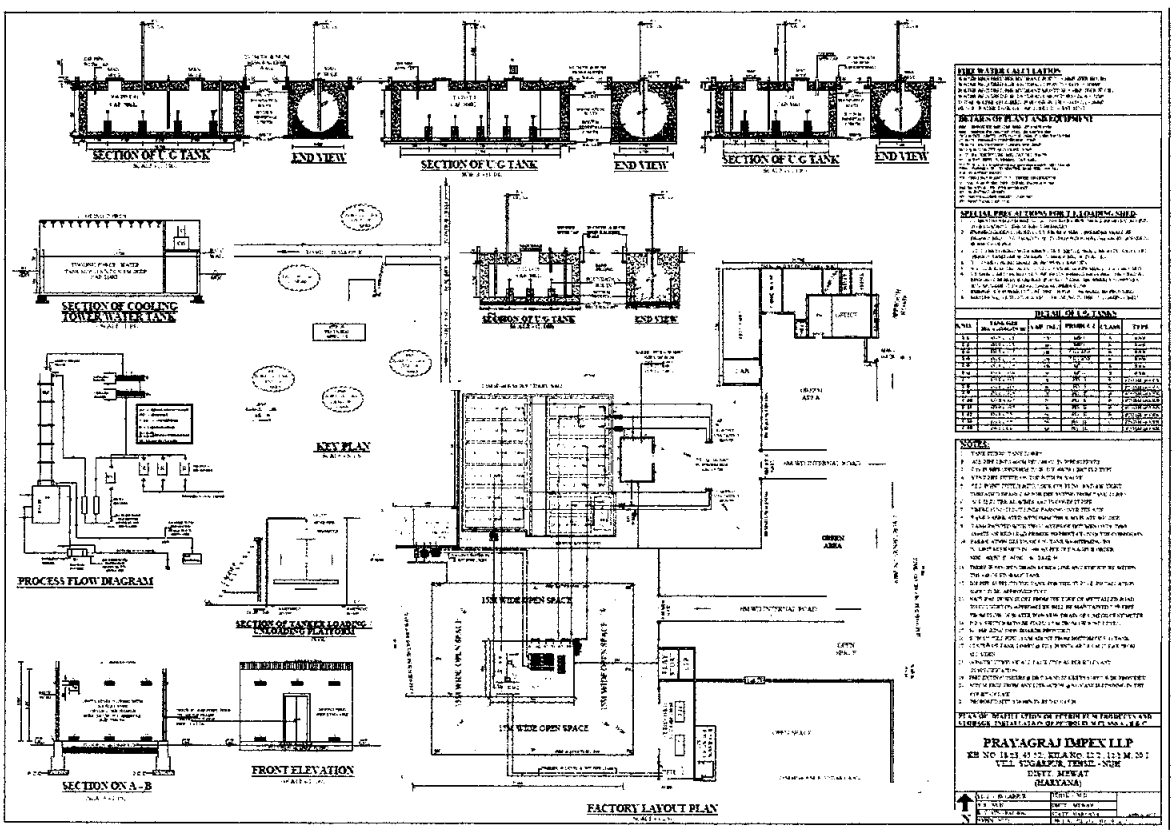


Figure 2.5: Layout Plan of the Proposed Project

2.4.3 Water

Total requirement of water is 2 KL. No water is discharged from the plant. The processing water is recirculated in the condensers. The makeup water for cooling tower is 0.825 KLD

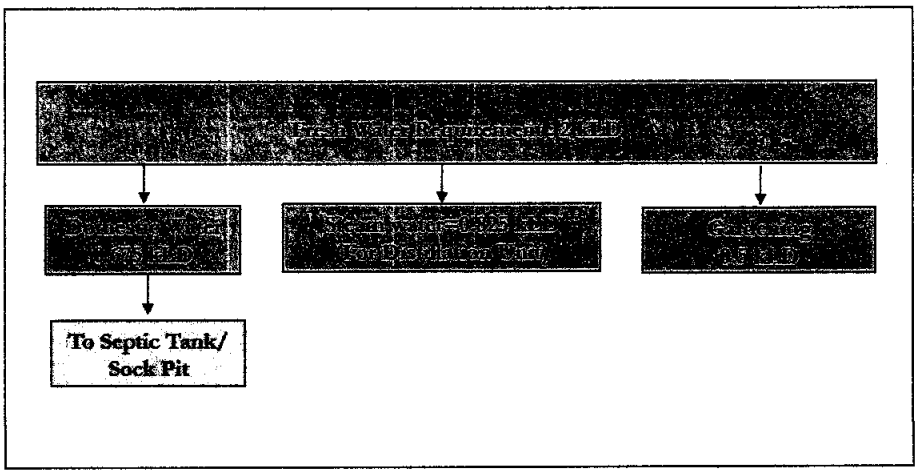


Figure 2-6: Water Balance Diagram

2.4.4 Electricity

The total power requirement will be 180 KVA which will be sourced from HSEB Haryana State Electricity Board.

2.4.5 Fuel

The fuel will LDO & HSD from local vender will be utilized.

2.4.6 Manpower

Manpower needed - 15 no's

2.4.7 Utilities

6 KL water storage cum cooling pond will be provided to supply the cooling water requirements. This will also serve as a reserve for the water for fire hydrants. Drinking water storage and supply will be provided separately. The total daily requirement will be 2 KLD.

Table:2.4: Details of Utility Requirement

S. No	Details	Capacity	Remarks
1.	TFH– (1 No.)	10 Lakh K Cal	Rating 6 Lakhs K Cal
2.	Cooling Tower – (1 No.)	300 TPH	One time requirement 6 KL
3	Chilling Plant – (1 No.)	30 TR	One time requirement 60 KL

2.4.8 Raw Material

The raw material for fraction distillation is crude petroleum and mixtures of hydrocarbons. Total quantity will be required 12,000 KL per annum. Raw Material / feed stock will be brought by road Tankers. The tankers will be unloaded by gravity / through pump into the main underground / overhead storage tanks.

2.5 SIZE OF PROJECT

M/s Prayagraj Impex LLP is proposing 12,000 KL/year Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons. The process includes basic raw material requirement, process equipment, raw material and product storage, utilities & services, infrastructure facilities

2.6 MANUFACTURING PROCESS

Raw Material / feed stock (petroleum crude) will be brought by road Tankers. The tankers will be unloaded by gravity / through pump into the main underground / overhead storage tanks. The distillation section mainly consists of feed vessel, distillation column, primary & Secondary condensers, reflux drum, main product receivers and pumps. The feed from storage tanks is transferred to distillation kettle the kettle TFH of capacity 10 Lakh kcal (with heating tube bundles and outside jacketed) to provide heat to increase feed temperature and also to supply latent heat of vaporization; the heat is supplied by Thermic fluid heater. The vessel operates on batch mode. Around 40 KL feed material as received in the vessels. Heating of the material is than started by gradually diverting Thermic fluid through the heating coils the temperature rise of Thermic fluid is monitored and allow it to heat up to 100 Deg C. At around 60 to 70 Deg C temperature of the boiler, the vapours feed starts rising as to be column. The column is a packed M.S. distillation Column with 5 packed sections. The column is packed with 25mm CS Pall ring packing. Each packing section is approximately 3 meters in height. They are provided with grid type packing support and redistribution baffles. The column is insulated & installed in a independent high structure open to atmosphere. The vapours entering the column starts rising through column some of the vapours turn condensing through the wall of column the condensed liquid returns to reboiler. The column top and reboiler (vessel) temperature are maintained at desired levels to get first cut of 50 – 120 C° Temperature of column is maintained with the help of reflex. Ratio of reflux is measured by Rota meter. Now check the sample of reflux drum material, if it is suitable for first product i.e., 50-120 C°, start product withdrawal to receiver. While product discarding maintains reflux ratio around 1:0.5 After overhead liquid end-point exceeds first cut specification the column parameters are adjusted for second productive at 120-200 Deg C repeat the same procedure as described for first product withdrawal. After achieving end point of second product, heating of reboiler is stopped and the column is allowed to cool down. The liquid holds up packing also gets drained to reboiler. The cooling of reboiler material is started by cooling them through condenser to atmospheric temp. and third product fuel oil from the reboiler is withdrawn by the jacketed pump and cooled through the cooler and taken to residue receiver. The operation is repeated in the subsequent batch distillations. Requirements for the specialty products from the distillation may be small with wide-spread specifications. Therefore, Three / Four major fractions will be manufactured by Batch process distillation-unit having two distillation columns. As per market conditions and requirements, further treatment may be carried out at outside agencies. The process of specialty oil manufacture has following objectives.

1. Adjustment of boiling range or molecular size by distillation.
2. Adjustment of chemical nature or molecular type by chemical refining.
3. Final finishing operations to improve colour and odour.
4. Blending to meet specific market specifications.

Following are the major processing steps.

a) Stock preparation

b) Batch Distillation

c) Feed Chemical refining to remove colour and odour.

d) Blending of various solvents / specialty oils are as per customer requirement

There is major six steps:

1.Heating, 2. Boiling, 3. Fractional Columns, 4. Colling, 5. Condensation, 6. Collection

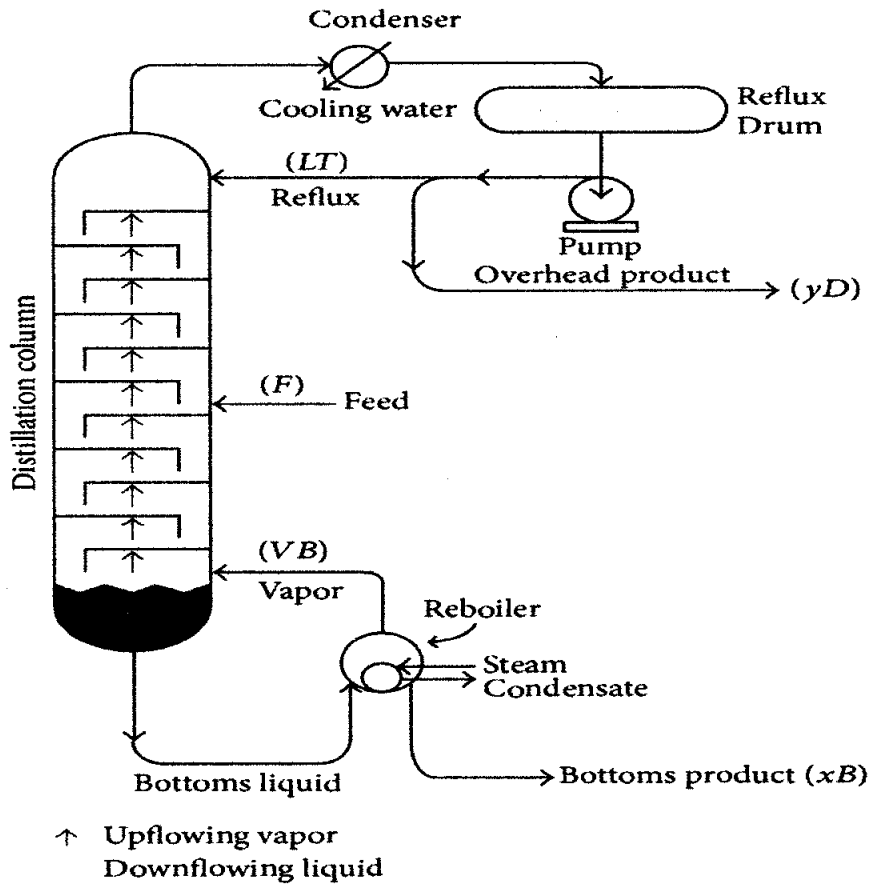


Figure 2.7: Schematic Diagram of Fractional Distillation

Table 2.5: Product and end use

S.No.	Name of Products	Max Qty KLA	CAS	Chemical Formula	Characteristics	End use
1	Acetone	1000	67-64-1	C3H6O	Boiling point 132.80°F (56°C) Melting point-139°F (-95°C) Average Molar mass 58.08 g/mol	As Solvent in Chemical industry

2	Toluene	1000	108-88-3	C6H5CH3	Boiling point 231.08°F (110.60°C) Average Molar mass 92.1381 g/mol Melting Point: −95 °C	
3	Xylene	1500	1330-20-7	C8H10	Boiling point 143 - 145 °C Vapor Density: 3.7 Melting Point: -25 °C DLH: 900 ppm TWA: 100 ppm	Fibers, films, and dyes.
4	Mineral Turpentine Oil (MTO)	1500	8006-64-2	C10H16	Flash Point: 35°C Specific Gravity:0.79 Boiling Point: 145°C to 205°C Vapors density : 4.8	Paint, pigment, Solvent
5	Aromatic Hydrocarbon of C-5 to C-9	1500	64742-95-6	C9--	Flash Point [Method]: >42°C LEL: 0.9 UEL: 6.2	Solvent, Paint, Adhesive, resin printing ink, plasticizing
6	Light diesel Oil (LDO)	2500	68476-30-2	-	Flash Point: 9 °C Boiling Point :207-535 Deg C Pour Point: < 21 °C vapors Density:3 to 5	Fuel
7	Fuel Oil (FO)	3000	68476 – 33.5	-	Flash Point: 66°C BP-185 – 500 C vapors Density (Air-1): 3.00 – 5.00 (Heavier Than Air)	Fuel
Installed Capacity		12,000	12,000 KL per annum (feedstock)			

Table 2.6: Plant Machineries and Other Equipment

S.No.	Name of Equipment/Machinery	Make
1.	Kettle with distillation / Dehydration	Excel Engineering
2.	Column	Bombay Engineering works/Spechtech Engineering
3.	Heat Exchanger	Macro Blowers India/AAB Heat Exchanger
4.	Primary Condenser	Rohini Aircon/Enviro Tech Industrial Products.
5.	Secondary Condenser	Vision Air Tech
6.	Bottom Cooler	Ultracool Solutions llp
7.	Reflux System	K-Jhil Scientific Pvt. Ltd.
8.	Product Receivers	Flowtech Products Company/Pinnacle Equipments Pvt. Ltd.

9.	Nitrogen Plant	Trimech India/Linde India Nitrogen Plant
10.	Tanks for Raw Materials and Finished Goods	Step Techno Solutions LLP
11.	Thermic Fluid Heater	Thermotech System Limited/Neotech Energy Systems Pvt Ltd.
12.	Water Circulation and cooling.	Vraj Cooling System/Reynold India
13.	Refrigeration - Chilled water.	Reliance Refrigeration Company/ Godrej & Boyce Mfg. Co. Ltd.
14.	Power supply and distribution	Haryana State Electricity Board
15.	Instrumentation and Electrical Control	-
16.	Fire Protection and safety	-
17.	Vacuum System	-
18.	Test Laboratory	NABL accredited Laboratory (T-8771) valid upto 25/12/2023

Table 2.7: Electrical and Electronics

S.No.	Name of Electric Equipment	Make
1	MCC Panel	CRCA/Syska/Crompton
2	Electrical Motor of specified capacities for pumps	Peerless Pumps/Ace Electric motor & pumps
3	Flame proof light fitting like: 160-Watt MLL, 200-watt floodlight	Phillips/ Bajaj
4	FLP Starters	Instec India /Patco
5	FLP Push Buttons	Prateek/ SEPL
6	FLP Junction Boxes	Prateek/Instec India
7	Cables	Vguard/Havells

PIPES & PIPES FITTING LIKE FLANGES, BENDS, NIPPLES ETC.

VALVES: Ball valve, globe valve, Gate Valve, Needle Valves for utilization at specialized application.

STRUCTURAL STEEL: For construction of supports to each equipment like, Reboiler, Column, Heat Exchange.

INSULATION:

a. HOT APPLICATION: Application of glass wool on hotlines & equipment followed by aluminums sheets cladding.

b. COLD APPLICATION: Application of thermocol pipe section to cold line followed by aluminums sheet cladding.

PUMPS

Fluid: Hydrocarbon

Sp. Gr.: 0.68 to 0.85

Viscosity: Negligible

Capacity: 20 m^3 / hrs.

Total Head: 25 Meter

M.O.C.: C.S.

Qty.: 4 Nos.

FIRE FIGHTING PUMP

Fluid: Water

Capacity: 90 m3 / hrs.

Discharge Head: 80 M

Temp.: Ambient

Sp. Gr.: One

Visc.: One

M.O.C.: C1

Qty.: 01

REFLUX PUMP

Fluid: Hydrocarbon

Sp. Gr.: 0.68 to 0.75

Viscosity: Negligible

Capacity: 20 m^3 / hrs.

Total Head: 30 Meter

M.O.C.: C.S.

Qty.: 1 No.

Table 2.8: List of laboratory equipment /Apparatus installed

S.No.	Name of Equipment	Purpose	IS Method
1.	ASTM Distillation	Bottling Range	
2.	Hydrometer	Density	160/82
3.	Viscometer	Viscosit	
4.	Annuline Point Appts	Annuline Point	71/83

5.	Abel Flash Point Appts.	Flash Point	33/59(78)
6.	Penssky Martens Closed Tests	Flash Point	33/59(78)
7.	Reflectometer	Reflective Index	34/82
8.	Chemical Balance	For Weighting	-
9.	Matter Balance	For Weighting	-
10.	Conradson Residue Appts	Carbon Residue	-
11.	Muffle Furnace	Ash Content	13/82
12.	Copper Strip Tarnish	Copper Corrosion	55/77(83)
13.	Centrifuge Appts	Centrifugal Force	-
14.	Dean Stork Appts	Water Content	1448(p:48)1972
15.	Oil Content Appts	Oil Content	-
16.	Distillation Appts.	True Boiling Point	-
17.	Smoke Point Lamp	Smoke Point	-
18.	Appts.	Pour	15/67/81
19.	Conc. Penetration	Penetration of Petroleum Jelly	50/53
20.	Appts.	Evaporation of Petroleum Products	-
21.	Cleveland Open Cup	Flash Point	36/83
22.	Appts.	Saponification No. of Petroleum Product	-
23.	Colour meter	Colour	196/66(81)
24.	Sulphonation Flask	Aromatic Contents & USR	-
25.	R.C.S Tube	R.C.S. Point	-
26.	Appts.	Cloud Point	219/82
27.	U.V. Spectrometer	Ultra Violet Range of Petroleum Products	-

2.7 POLLUTION LOAD AND CONTROL MEASURES

The products handled are all processing / Recycling products and so are completely evaporated during heating and do not leave any residues. Still to avoid any vapor loss to the atmosphere. The care will be taken to arrest all pollutants at source.

2.7.1 Wastewater Generation

Total requirement of water is 2 KL. No water is discharged from the plant. The processing water is recirculated in the condensers. The makeup water for industrial requirement is 0.825 KLD.

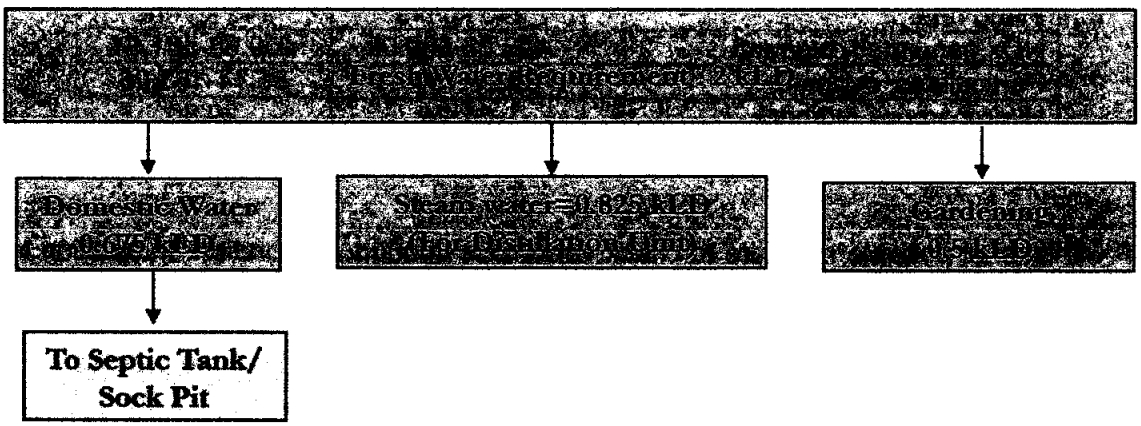


Fig. 2.8: Water Balance diagram

Table 2-2: Waste Water Generation

S. No.	Activities	Wastewater Generation (KLD)
1.	**Domestic Use**	**0.675 KLD**
2.	**Industrial Use**	
a.	Stream Water (for Distillation Unit)	0.825 KLD

Sewage System: The project will involve about 15 people employments on three shift bases however around 50 people additionally may be visiting in project site as truck drivers or cleaners or visitors etc. thus considering 15 people daily disposing the domestic effluent, Domestic effluent collected through toilet blocks and other areas will be collected through well designed sewer network and send to soak pits for the disposal. The treated sewage will be used for irrigation and to meet flushing requirement. Though there is no Water Discharged from the plant therefore no Treatment of Sewage water is needed.

2.7.2 Air emission

Smoke from the Thermic Fluid Heater is within limit and is discharged at safe height. From the Stack of Thermic Fluid Heater (stack height 30 m) and D.G. Set with adequate stack height of 11 m.

- From the vapor discharge from the distillation Plant.

- The stack height is kept high to keep the discharge within the limited.

An expected discharge analysis (Typical) is given below:

Fuel	HSD	LDO
Density, g/cc	0.83	0.87
Flue gas quantity nm3/kg	13.5	13.5
Sulphur, % by wt. %S	0.50	1.80
Sox generated, mg/nm3	740	2664
Firing rate	240 kg/hrs.	240 kg/hrs.
NOx generated, mg/nm3	428.38-589.02	409.68-561.94
Particulates, mg/nm3	89.25-160.64	85.14-153.26
Hydrocarbons mg/nm3	31.24	29.80
Unburnt mg/nm3	400-500 ppm	400-500 ppm

PP will take all possible measure to check vapor loss through evaporation. In addition to a primary condenser, we have provided a secondary condenser with chilled water circulated in it. This takes care of any uncondensed hydrocarbons from the primary condenser to get condensed in the secondary condenser. Thus, there is no discharge from the process.

Air Emissions in operation phase is shown in the following:

Table 2-10: Air Emission from Proposed Project

S.No.	Description	Flue		Process
1.	Stack Attached to	TFH (10 Lakh kcal)	DG Set	Process Vent
2.	Stack Height (m)	30	11	11
3.	Stack Dia (mm)	350	-	350
4.	Fuel Type	LDO	HSD	-
5.	Fuel Quantity	3.25 KLD	20 L/hrs.	
6.	Nature of Pollutants	PM, SO_x, NO_x		VOC & HC
7.	Emissions control system	Multi Cyclone & Dust Collection		Venturi Scrubber

Vapours from Storage Tank: No vapours allowed to go to the atmosphere due to the use of proper double condensers. All the storage tanks are provided with nitrogen purging system and fitted with PV valves which take care of evaporation from the tanks.

2.7.3 Solid and Hazardous Waste Generation

Some Solid and Hazardous wastes will be generated in the operation Phase. They are listed in the following tables

Table 2.11: Solid Waste (Non-Hazardous)

S.No	Name of Solid Waste	Quantity (TPA)	Disposal
1.	Fly Ash	50	Collection, Storage, Transportation, Disposal by selling to brick manufacturer.

2.	Poly Bag	1	Selling to recycler.

Table 2.12: Details of Hazardous Waste Generation and Management

S. no.	Type/ Name of Hazardous waste	Source of generation	Category and Schedule as per HW Rules.	Quantity (TPA)	Disposal Method
1	Used oil	Machinery	5.1	0.2	Collection, Storage, Transportation, Disposal by selling to register refiners

2.7.4 Noise Generation

There are not any main source of noise and vibration in the proposed unit except plant machineries. However, the following adequate precautions will be taken for control of noise & vibration:

- Proper and timely oiling, lubrication and preventive maintenance will be carried out for the machineries and equipment to reduce noise generation.
- Adequate noise control measures such as anti-vibration pad for equipment with high vibration will be provided.
- All the vibrating parts will be checked periodically and serviced to reduce the noise generation. The equipment, which generates excessive noise, will be provided with enclosures etc.
- To minimize the adverse effect on the health, ear muffs / earplugs will be provided to the working under high noise area.
- To reduce the noise generation during the transportation activities; the vehicles will be kept periodically serviced and maintained as per the requirement of latest trend in automobile industry.
- Only those vehicles with PUC's will be allowed for the transportation.
- The transport contractors will be informed to avoid unnecessary speeding of vehicles inside the premises.
- Green belt area will be developed to prevent the noise pollution inside and outside the factory premises.
- Noise monitoring will be carried out regularly at different parts of the plant.

2.8 GREENBELT DEVELOPMENT

A greenbelt of 2145 Sq. m. (33.0 %) will be developed in the plant premises. Approx. 10m wide greenbelts will be developed around the plant premises. The species selection will depend upon type of soil and local species with good survival rate will be selected. Species has been selected on following basis: -

- Fast growth;
- Capacity to endure water stress and climate extremes after initial establishment;
- Tolerance to specific conditions or alternatively wide adaptability to eco physiological conditions;
- Differences in height and growth habits;
- Pleasing appearances;

- Providing shade;
- Trees should be tall in peripheral curtain plantation, with large, spreading canopy in the primary and secondary attenuation zones.

2.9 ASPECT AND ANALYSIS

During operation phase, the following aspect has been considered during design stage with its mitigation measures:

Table 2-13: Anticipated Impacts during Operation Phase

Activity	Environmental Attribute	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Intensity and Significance
Vehicle Movement andutilities operation	Air Quality	Exhaust Emission i.e., NO_x, SO_x and HC. Fugitive emission	Negative	Short Term	Irreversible	Low due to Movement of vehicle only for loading and unloading of raw material and finished goods. Development of concrete roads. Provision of APC"s.
	Noise Levels	Noise Generation	Negative	Short Term	Irreversible	Low, due to limited activity
	Risk & Hazards	Accidents, collision of transport vehicles	Negative	Short Term	Irreversible	Medium due to loss of property and injury to manpower.
Product andraw material handling andstorage	Risk & Hazards	Catch fire accidents	Negative	Short Term	Irreversible	High, due to injury to manpower and loss of properties And fatal accidents
		Leakage and spillage from pipelines or storage containers/ tanks	Negative	Short Term	Irreversible	High, due to corrosion, leaching, burn injuries and loss of properties.
Manufacturing processing	Noise Levels	Noise Generation from utilities, processing machineries and reaction vessels	Negative	Long Term	Irreversible	Low, due to noise reduction measures

	Work Zone Air Quality	Process gas and flue gas generation	Negative	Long Term	Irreversible	Medium, due to air pollution Control devices (APC"s)
	Risk & Hazards	Catch fire accidents	Negative	Short Term	Irreversible	High, due to injury to manpower and loss of properties and fatal accidents
		BLEVE effect, Amputation and fall injuries	Negative	Short Term	Irreversible	High, due to various operational activities manually As wellas

2.10 PROJECT SCHEDULE FOR APPROVAL AND IMPLEMENTATION

The industry will take necessary approvals from the consented authority and start the construction immediately after obtaining Environmental Clearance and Consent from state pollution board. About 12 months will be required to complete commissioning.

Table 2.14: Project Implementation Schedule

S. No.	Work Implementation	Time
1.	Procurement of Construction Material	2 Months
2.	Construction Activity	2 Months
3.	Purchase of machinery and other utilities	2 Months
4.	Installment of machinery	2 Months
5.	Commissioning of Machinery with application on CC-A	2 Months
6.	Operation Activity	2 Months
Total		**12 Months**

2.11 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY FOR THE RISK OF TECHNOLOGICAL FAILURE

The technology used for the proposed project is well tested and meets the all-cleaner production technology standards as it is already adopted and implemented by countries in worldwide. Hence, there is no assessment of new & untested technology for the risk of technological failure required.

There will be periodic arrangement of environmental training program to create understanding among plant personnel towards environment. Unit will manufacture products with maximum yield by using high-quality of raw material and advanced process technology. To minimize material wastage, standard SOP will be followed by the unit.

2.12 SUMMARY

Proposed Greenfield project of Fractional distillation of Petroleum Crude and mixture of hydrocarbons with capacity of 12000 KL/year at village- KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107. The ToR has been granted on 1st June 2022. Invest Rs. 2 Crores as capital cost of project. National Park/ Wildlife sanctuary/ Marine sanctuary/ Reserve Forest is not located within 10 kms radius of proposed project. Total water consumption will be 2 KLD. Power requirement 180 KVA electricity will be sourced from HSEB and for emergency DG Set will be available. LDO, HSD will be used as fuel and sourced from local supplier. 15 Nos. of manpower including contractor workers will be employed during operation phase. There is no trade effluent envisaged from the proposed unit, the water is reused back in to the process, hence proposed project is Zero Liquid Discharge (ZLD) unit. Adequate size and No. of APC (Cyclone Separator, Bag filter, Venturi scrubber) will be provided to achieve the statutory norms.

3. DESCRIPTION OF THE ENVIRONMENT

3.1 GENERAL

Every anthropogenic activity has some impact on the environment. More often it is harmful to the environment than individual. Consequently, there is a need to harmonize developmental activities with the environmental concerns. Environmental impact assessment (EIA) is one of the tools available with the planners to achieve the abovementioned goal. It is desirable to ensure that the development options under consideration are sustainable. In doing so, environmental consequences must be characterized early in the project cycle and accounted for in the project design. The baseline data on the pre-installation status of the terrestrial environment covering land, biological (flora & fauna), marine & socio-economic environment in the study area was collected by undertaking primary surveys through field visits, monitoring and laboratory analysis. Secondary data was collected from relevant agencies, such as Mewat town planning, forest department and directorate of census operations. The baseline data collected and generated, together with the relevant project activities is considered for predicting the likely impacts of the project on the environment. Subsequently, an appropriate environmental management plan (EMP) is presented to enable the project proponent to run the project within acceptable level of environmental impact and meet the compliance of the regulatory criteria (MoEFCC guidelines).

3.2 BASELINE STUDY AREA AND PERIOD

The study period of baseline data collection has been considered from 1st of March 2022 to 31st May 2022 by Enviro-Tech Services Laboratory (NABL accredited (T-8771 valid till 25/12/2023) and Recognized by MoEF&CC, New Delhi). The ToR has been granted on 1st June 2022 however, the request has been made during the application for baseline data collection from March to May 2022 considering pre-monsoon (summer) season as per SO 996(E) dtd. 10th April 2015 and OM No. J—11013/41/2006-IA-II (I) (Part) dtd. 29th August 2017 considering Std. ToR for schedule 5(e) available at Parivesh portal.

Map 3-1: Study Area Map

3.3 METHODOLOGY

The baseline environmental study was carried out for the various environmental components viz. Air, Noise, Soil, Water, Ecology and biodiversity and Socio economy. Before the finalization of sampling locations to carry out the environmental monitoring and survey, our field area expert had visited the site. All the locations have been selected within 10 km radius from the project site as per the requirement of TOR and environmental samples were collected from the selected locations of the study area of industrial project site. Before starting the survey activity for ecology and bio diversity and socio-economic status, secondary data were used as reference during the desktop survey for listing the species of study zone and planning the survey activities. As a secondary source of data, for Ecology and Biodiversity survey various publications by the government of Haryana and forest department Nuh were used. For Socio economy, Census of India 2011 was referred and considered.

3.4 STUDY PERIOD AND FREQUENCY OF SAMPLING

The period of study was 1st March to 31st May 2022. Details of frequency of environmental sampling considered for the study are illustrated in table 3.1

Table 3.1 Samling, Parameters and Frequency for Baseline Data Collection

Attributes	Sampling		
	Locations	Parameters	Frequency
A. Air Environment			

Micro-meteorological Data	Nearby. Project Site	Temperature, Relative Humidity, Precipitation Wind direction, Wind Speed.	Hourly data for the period 1st of March 2022 to 31st May 2022.
Ambient Air Quality	8 numbers of locations in the study area of 10 km radius.	$PM_{2.5}$, PM_{10}, SO_2, $NO_{x, CO}$, VOC, NMHC	Twice a week on 24 hrs basis for 12 weeks
B. Noise	8 numbers of locations inthe study area of 10 km radius.	Leq. Day Time, Leq. Night Time	Continuous monitoring for 24 hours (Day & Night) at each location, once in a month for 3 months
C. Water			
Ground Water	Samples from 8 numbersof locations within 10 kmradius from the project site.	Physical, Chemical, Microbiological and Heavy Metal.	Once in Study Period.
Surface Water	Samples from 2 numbersof locations within 10 km radius from the project site.	Physical, Chemical, Microbiological and Heavy Metal.	Once in Study Period.
D. Soil Quality	Samples from 5 numbers of locations within 10 km radius from the projectsite.	Physical, Chemical Characteristics, Soil Texture, Heavy metals.	Once in Study Period.

3.4.1 Method of Environmental Sampling and Analysis

The methods adopted for environmental sampling and analysis are illustrated in following table 3.2.

Table 3.2: Method of Environmental Sampling and Analysis

Attributes	**Methods**	
	Sampling/Preservation	**Analysis**
A. Air Environment		
Micro-meteorological Data	Data collected on hourly basis using wind monitor as per CPCB Guideline.	NA

Attributes	Methods	
	Sampling/Preservation	**Analysis**
Ambient air quality	As per IS: 5182, CPCB & AWMA.	As per IS:5182, CPCB & AWMA
B. Noise	Instrument: Sound level meter	Survey carried out as per EPA
C. Water		
Ground Water	Standard Methods for Examination of Water and Wastewater, 22nd Edition, APHA 2012.	IS 3025 & Standard Methods for Examination of Water and Wastewater, 22nd Edition, APHA 2012
Surface Water / Marine Water		
D. Soil Quality	IS 2720	IS 2720, Laboratory developed Method as per NABL requirement and Book - Soil Testing in India (Department of Agriculture & Cooperation)
E. Land Use & Land Cover	Land use map prepared by field area expert by visual image interpretation using data of USGS OLI-8I.	
F. Ecology & Biodiversity Data	Collection of primary data by adopting the following method: Opportunistic observation/ species list method/direct sighting /intensive search/ bird calls/ Pug mark/ Food print/ Debarking and conformation with local public.	Short listing and classification of flora and fauna recorded during the survey as per the requirement.
G. Socio Economic Data	Primary data collection by site visit and Secondary data verification.	Primary data collection by site visit and Secondary data verification.

3.5 MICROMETEOROLOGY

The study of micro – meteorological data helps to understand the variations in the ambient air quality status in that region. The prevailing micrometeorological condition at project site plays a crucial role in transport and dispersion of air pollutants. The persistence of the predominant wind direction and wind speed at the project site decide the direction and extent of the air pollution impact zone. The principal variables which affect the micrometeorology are horizontal transport and dispersion, convective transport and vertical mixing and topography of the area towards local influences.

3.5.1 Source of Meteorological Data

Micrometeorological data were collected by using the weather station as per CPCB guideline which was installed near project site. All the micrometeorological data were

collected on hourly basis for the period 1st March to 31st May 2022. Meteorological conditions of the study area are presented in **table 3.3**.

Table 3-3: Meteorological Condition of Study Area

Month	Temperature (°C)		Relative Humidity (%)		Wind Speed (km/h)	
	Min.	Max.	Min.	Max.	Min.	Max.
March	19	43	03	40	01	25
April	26	45	02	29	02	19
May	20	45	07	84	02	26

3.5.2 Temperature

During the study period minimum temperature was recorded is 19°C and maximum temperature was recorded is 45ºC Temperature data were collected on hourly basis during the study period. Variation of temperature is presented in **table 3.3**.

3.5.3 Humidity

Humidity affects the nature and characteristics of pollutants in the atmosphere as it is the measure of amount of moisture in the atmosphere. Humidity helps suspended particulate matter to coalesce and grow in size to settle under the gaseous pollutants by providing them aqueous medium. During the study period minimum Humidity was recorded 2% on month of April and maximum Humidity was recorded as 84% on month of May. The variation in humidity is represented graphically in **table 3.3**

3.5.4 Wind Velocity and Wind Direction

Hourly wind speed data were collected for the period 1st March 2022 to 31st May 2022 with the help of wind monitor. The rate of dispersion, diffusion and transportation of pollutants in the atmosphere mainly depend on wind speed and its direction. Wind direction and velocity data have been collected during the study period. Dominant wind direction was from West and North east during the study period. Wind speed was observed from 1-25 km/hr. in the month of March, from 2-19 km/hr. in the month of April and from 2-26 km/hr. in the Month of May 2022. Month-wise maximum and minimum wind speed data are tabulated in **Table 3.3**

Wind Rose

Wind rose diagram is a graphical representation of the magnitude and direction of wind speed considering all the directions. From the knowledge of wind rose one can easily predict the direction and extent of spreading of the gaseous and particulate matter from the source. Wind rose diagram has been prepared by using hourly wind velocity and dominant wind direction data and is presentedin **Figure 3.1**

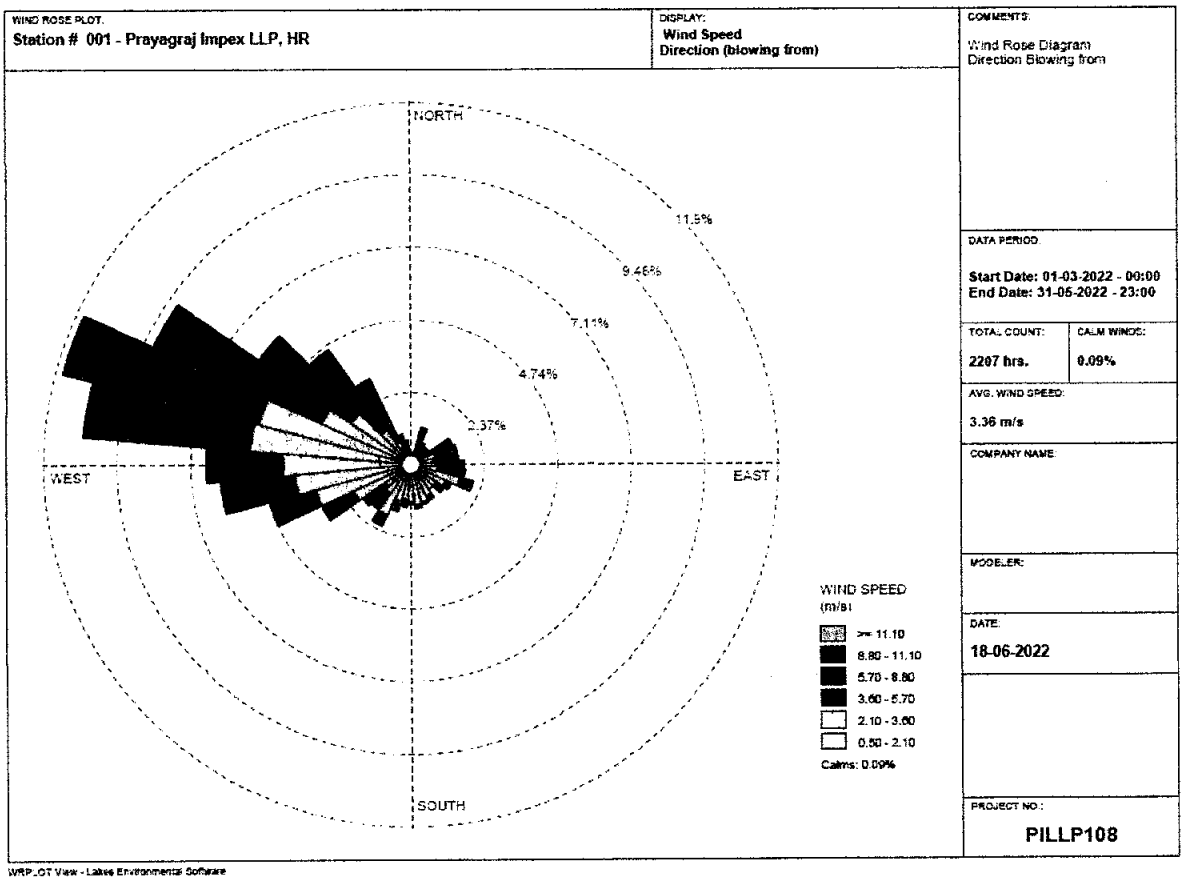


Figure 3-1: Wind Rose Diagram (1st March to 31st May2022)

3.5.5 Interpretation of Micrometeorological Data

Wind rose diagram indicate that the wind pattern of the study region was NW to SE. Dominant wind direction can be considered WWN to EES. Based on micrometeorological data, of wind direction and wind speed it is interpreted that chances of maximum dispersion of pollutants will be in direction due to upcoming project during the period March to May. direction also be impacted during this period

3.6 AIR ENVIRONMENT

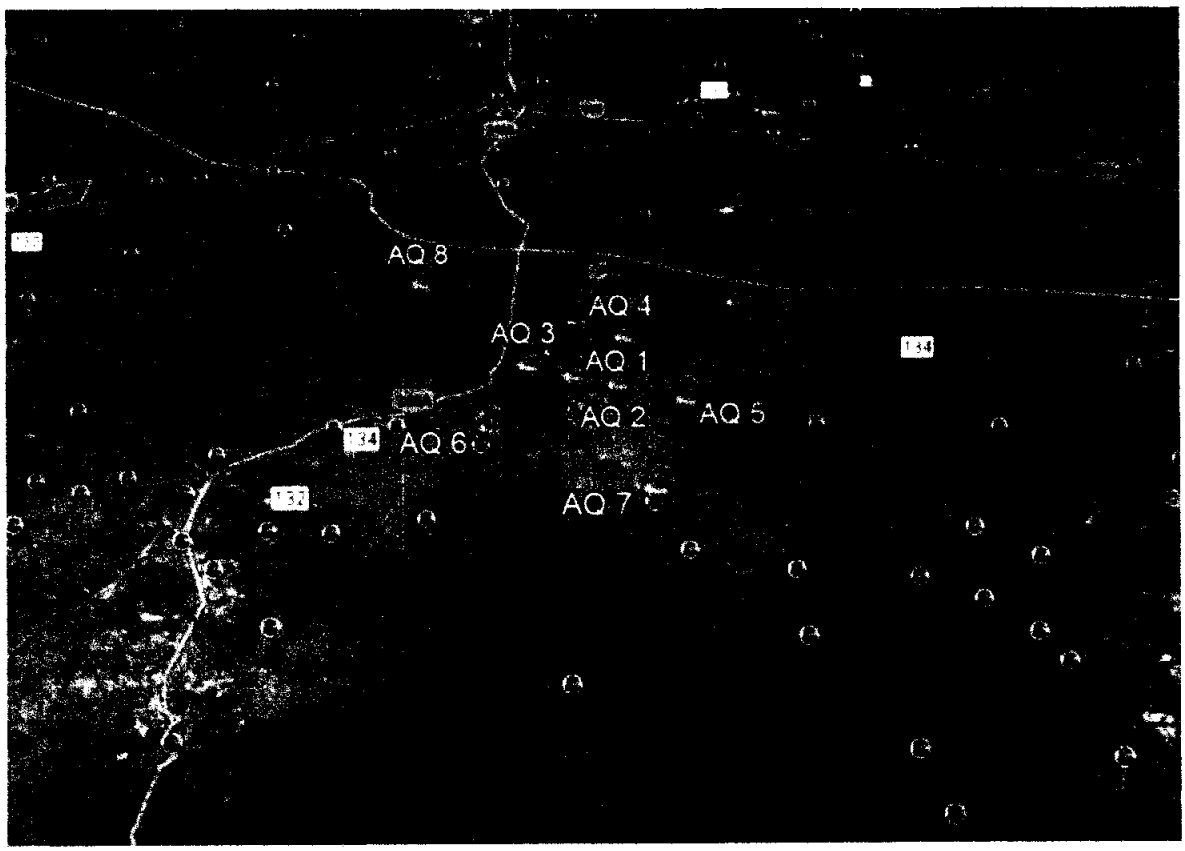
Air is the Earth 's atmosphere having the gases in which living organisms live and breathe but air is being deteriorated day by day due to the anthropogenic and natural sources. In present scenario Industrialization, Energy production and the burning of fossil fuels has polluted the air environment. Ambient air quality monitoring was carried out for the assessment of the existing status of background air quality in the study area. This will be useful for assessing the conformity of the ambient air quality to the standards even after commencement of the proposed project.

3.6.1 Selection of Sampling Locations

Following points were considered during the selection of Ambient Air Quality Monitoring locations.

- Topography/terrain of the study area.
- Regional synoptic scale climatologically norm 's,
- Densely populated areas within the region,
- Location of surrounding Industries,
- Representation of regional background,
- Facility for Ambient Air Monitoring,
- Representation of valid cross – sectional distribution in downwind direction,
- Avoidance of proximity of roads, construction activity or any other perturbing activity which maybe temporary in nature, which may lead to some erroneous conclusions.
- Availability of manpower, electricity, approach, sturdy structure and protection of samplers.
- Dominant Wind Direction.

To establish the baseline status around the project site of the study region, monitoring was conducted for 8 numbers of locations during 1st March 2022 to 31st May 2022. At the time of location selection previous micrometeorological data was referred and general wind pattern in the study region was considered for the selection of minimum one location in the downwind direction. However, ambient airmonitoring locations were selected in all the directions looking towards the possibility of change in wind pattern during the study period. Ambient Air Quality monitoring locations are presented in **Map 3.2 and Table 3.4**



Map 3-2: Map Showing the Study Region with Locations for Ambient Air

Table 3.4 Air Sampling Location

Location code	Location name	Distance	Direction	Selection criteria	Latitude	Longitude
AQ1	At Project Site	Inside project site	-	On-site Location	28° 7'25.82"N	77° 4'56.30"E
AQ2	Chhachera (NS Store)	0.90	SSE	Downwind	28° 7'15.03"N	77° 5'30.16"E
AQ3	Ghasera	1.04	NWW	Upwind	28° 7'41.91"N	77° 4'20.20"E
AQ4	Chhapera Village	1.81 km	NNE	Crosswind	28° 8'11.33"N	77° 5'37.76"E
AQ5	Adulka Village	2.62 km	SE	Downwind	28° 6'54.82"N	77° 6'21.72"E
AQ6	Manki Village	2.32 km	SSW	Crosswind	28° 6'31.32"N	77° 3'52.58"E
AQ7	Bainsi	3.95 km	ESE	Downwind	28° 5'19.91"N	77° 5'53.50"E
AQ8	Rethora	5.40 km	NNW	Upwind	28° 9'30.41"N	77° 2'51.51"E

Frequency and Parameters for Sampling

Sampling team was appointed with one FAE and Technical Assistant to carry out Ambient Air Quality Monitoring for 8 numbers of locations within 10 km radius from the project site. Sampling and analysiswere carried out as per CPCB, IS 5182 & EPA and instrument operation manual for the parameters $PM_{2.5}$, PM_{10}, SO_2, NOx, CO, VOC, NMHC After the completion of sampling, samples were brought to the laboratory in Ice box and filter box for analysis. Frequency of sampling was twice a week during study period.

3.6.2 Instruments for Sampling

Samples were collected by using the PM_{10} and $PM_{2.5}$-micron dust samplers at suitable height (>3m) above the ground level as per the availability of the facility. Methods of Sampling were adopted as outlined by Central Pollution Control Board, Bureau of Indian Standard and National Environmental Engineering Research Institute. Monitoring was carried out as per the instructions of instruments manual. Details of method are presented in **table 3.5.**

Table 3-5: Details of Analysis Method

S. No.	Pollutant	Test Method
1.	$PM_{2.5}$	CPCB Guideline
2.	PM_{10}	IS 5182 Part 23, 2006
3.	SO_2	IS 5182 Part 2, 2001
4.	NOx	IS 5182 Part 6, 2006
5.	CO	Air and Waste Management Association (AWMA)

3.6.3 Quality of Ambient Air

Ambient air quality monitoring and analysis was carried out for 8 numbers of locations as per the standard methods. Minimum, maximum and percentile value for the parameters $PM_{2.5}$, PM_{10}, SO_2, NO_x and CO are tabulated.

Table 3-6: Minimum, Maximum, Average and Percentile Value of PM10 and PM2.5

Code No.	PM_{10} (µg/m³)				$PM_{2.5}$ (µg/m³)			
	Min.	Percentile 98	Max.	Avg.	Min.	Percentile 98	Max.	Avg.
AQ 1	76.43	83.32	83.52	80.07	37.58	41.95	42.04	39.96
AQ 2	77.25	81.61	81.67	79.50	37.15	42.19	42.61	39.66
AQ 3	89.42	95.07	95.41	92.21	50.49	56.37	57.28	52.92
AQ 4	77.12	83.62	83.62	80.26	37.12	42.16	42.16	40.08
AQ 5	91.69	96.52	96.58	93.95	50.39	56.67	56.91	53.96
AQ 6	91.28	96.35	96.78	94.13	51.49	56.83	56.85	53.88
AQ 7	87.12	94.14	94.15	92.01	46.39	53.62	53.91	49.76
AQ 8	77.12	82.90	83.14	79.42	37.85	43.14	43.14	40.59
NAAQ Standard limit as per new notification of	100				60			

MoEF&CC, 2009 (on 24 hr basis)		

Table 3-7: Minimum, Maximum, Average and Percentile Value of SO2 and NOx

Code No.	SO_2 (µg/m³)				NO_x (µg/m³)			
	Min.	Percentile 98	Max.	Avg.	Min.	Percentile 98	Max.	Avg.
AQ 1	10.52	12.81	12.94	11.80	20.19	22.94	22.96	21.88
AQ 2	9.65	11.79	11.89	10.90	19.14	23.39	23.59	21.04
AQ 3	13.46	15.61	15.79	14.40	23.46	27.30	27.41	24.68
AQ 4	10.24	12.54	12.58	11.34	19.66	23.64	23.64	21.31
AQ 5	13.25	15.48	15.59	14.32	22.14	26.93	26.96	24.39
AQ 6	12.49	14.83	14.94	13.50	22.59	26.36	26.51	24.10
AQ 7	12.75	16.12	16.38	14.51	22.15	26.50	26.51	24.73
AQ 8	10.19	12.92	13.24	11.42	19.58	23.65	23.65	21.53
NAAQS limit as per new notification of MoEF&CC, 2009 (on 24 hr basis)	**80**				**80**			

Table 3-8: Minimum, Maximum, Average and Percentile Value of CO

Code No.	CO (µg/m³)			
	Min.	Percentile 98	Max.	Avg.
AQ 1	0.56	0.72	0.72	0.63
AQ 2	0.53	0.63	0.63	0.59
AQ 3	0.76	0.85	0.85	0.81
AQ 4	0.52	0.62	0.62	0.57
AQ 5	0.75	0.87	0.89	0.81
AQ 6	0.69	0.84	0.85	0.79
AQ 7	0.76	0.84	0.85	0.80
AQ 8	0.52	0.61	0.61	0.57

NAAQ Standard limit as per new notification of MoEF&CC, 2009	**4.0**

Summary of Ambient Air Quality

- Results were compared with the standard for ambient air quality monitoring as per the Ministryof Environment, Forest and Climate Change (MoEF & CC).
- During the study PM_{10} was observed in the range of 76.43 — 81.67 µg/m^3. Maximumconcentration of PM_{10} was found at Manki Village.
- $PM_{2.5}$ was observed in the range of 37.12 - 42.04 µg/m^3. Maximum concentration of PM_{10} wasfound at Ghasera village.
- SO_2 concentration was observed in the range of 9.65-16.38 µg/m^3, which is well within thestandard limit.
- NO_x concentration in was observed in the range of 19.14 - 27.41 µg/m^3, which is well within thestandard limit.
- Monitoring and analysis were also carried out for CO. Result for the CO, was found well within the norms.

3.6.4 Interpretation of Ambient Air Quality Data

Based on comparison study of results for tested parameters with NAAQS, it is interpreted thatambient air quality of studied locations is good as all the results of studied parameter are well within the limit. This interpretation relates to the test data obtained during survey for particular locations only. There is very less no. of industry and numbers of investors have planned to install the industries, considering the probable impact due to upcoming industries, it is suggested that proper air pollution control measures must be adopted by the industry.

3.7 NOISE ENVIRONMENT

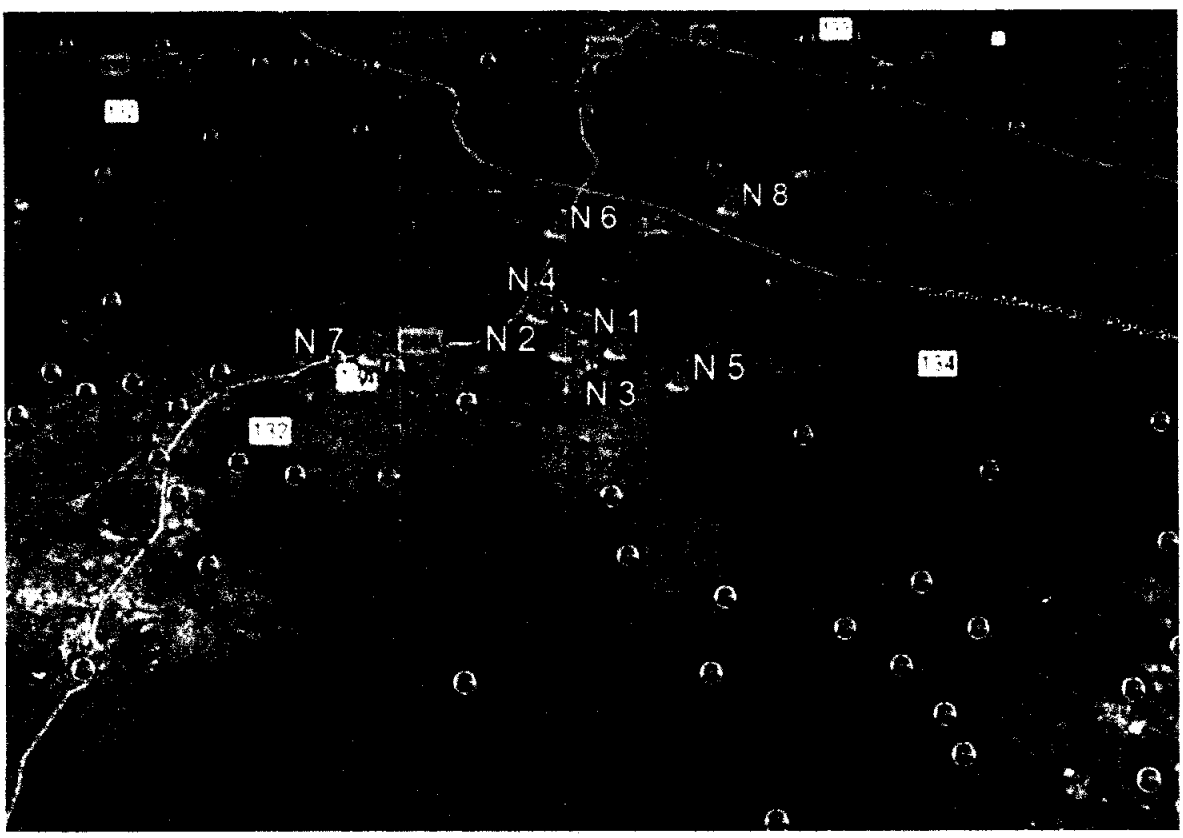
The objective of the baseline noise survey was to identify existing noise sources and to measure background noise levels at the sensitive receptors within the study area. Peoples 'perception of noise varies depending on number of factors including their natural sensitivity and hearing ability, past experience of sound, cultural factors and the time of day at which sound is experienced. Continuous sound is perceived quite differently from intermittent sound at the same level. High or continuousnoise levels may cause permanent loss of hearing ranging from reduced perception at certain frequencies to total deafness. At comparatively lower levels noise may have psychological effects including disturbance of sleep, annoyance and irritation.

3.7.1 Sources of Noise Pollution

The sources of noise pollution in the study area are industrial noise, noise due to commercial activities, noise generated by Community, Vehicular traffic etc.

3.7.2 Noise Level in the Study Area

Noise level monitoring was carried out with the help of sound level meter at 8 different locations fall under residential, industrial and high noise generating source. Noise sampling locations are presented in **Map 3.3** and **Table 3.9**. Analysis results are presented in **Table 3.10**



Map 3-3: Map Showing the Study Region with Locations for Ambient Noise

Table 3-9: Noise Monitoring Locations in the Study Region

Location code	Location name	Distance	Direction	Selection criteria	Latitude	Longitude
N1	Proposed Project Location	Inside project site	- -	Source	28° 7'26.10"N	77° 4'56.49"E
N2	SH-134 near PHC Ghasera	0.56 km	N	Transportation Noise	28° 7'6.95"N	77° 4'48.44"E

N3	Chhachera	0.96 km	SE	Village habitation near project site	28° 7'15.44"N	77° 5'28.58"E
N4	Ghasera	1.12 km	NW	Village habitation near project site	28° 7'42.33"N	77° 4'20.14"E
N5	Adulka Village	2.51 km	SE	Village in Study area	28° 6'52.18"N	77° 6'21.56"E
N6	NH-248A Near Hiranthala Village	3.64 km	N	Transportation Noise	28° 9'16.84"N	77° 4'10.81"E
N7	SH-134 Near Nuh Jail	4.22 km	SW	Transportation Noise	28° 6'42.13"N	77° 2'25.05"E
N8	Kundali-Manesar Palwal Expressway near Nawabagrh Village	5.60 km	NNE	Transportation Noise	28°10'5.12" N	77° 6'25.75"E

Table 3-10: Noise Monitoring Results during Day time and Night Time

S.No	Location	Observed Value Leq dB(A)			Limit as per CPCB Guidelines Leq. dB(A)		Zone
		Day*	Night*	Day/Night	Day*	Night*	
1	NQ1	51.2	38.4	47.4	**65.0**	**55.0**	Commercial
2	NQ2	46.1	35.4	45.9	**50.0**	**40.0**	Silence zone
3	NQ3	57.4	41.2	56.1	**65.0**	**55.0**	Commercial
4	NQ4	47.8	35.4	47.1	**50.0**	**40.0**	Silence zone
5	NQ5	48.6	38.0	48.4	**55.0**	**45.0**	Residential

6	NQ6	48.0	37.6	47.9	**55.0**	**45.0**	Residential
7	NQ7	52.1	38.1	51.1	**55.0**	**45.0**	Residential
8	NQ8	51.0	48.1	54.8	**55.0**	**45.0**	Residential
*Day Time			Leq(6.00AM TO 10.00 PM)				
*Night Time			Leq(10.00PM TO 6.00 AM)				

Noise standards have been designated for different types of land use i.e., residential, commercial, industrial areas and silence zones, as per 'The Noise Pollution (Regulation and Control) Rules, 2000, Notified by Ministry of Environment Forest and Climate Change New Delhi, February 14, 2000. Different standards have been stipulated for day (6 AM to 10 PM) and night (10 PM to 6 AM).

The noise level study shows that the noise levels are meeting the acceptable norms.

Summary of Noise Data

- Equivalent noise level was recorded maximum in Chachera Village 57.4 dB (A) during day time.
- Equivalent noise level was recorded maximum in Kundali-Manesar Palwal Expressway near Nawabagrh Village 48.1 dB (A) during night time.
- Among all the sampling locations the noise level ranges between 46.1 dB (A) - 57.4 dB (A) in day time and 35.4 dB (A) - 48.1 dB (A) in night time.

3.7.3 Interpretation of Noise Data

Based on noise level data obtained during the survey for residential area and industrial area, it is interpreted that noise levels are within the standard norms prescribed by MoEF&CC,2009. Looking towards the increase in noise generating sources it is suggested that there is need to apply noise reducing devices at noise generating sources and generate public awareness.

3.8 LAND ENVIRONMENT

3.8.1 Land Use Pattern of the Study area

The objective of assessing the land use details of the area is to know the existing land use pattern of the area and enable one to know about the land that can be used for the proposed development activities in the study area. It also enables to envisage the scenario emerging due to the increase in demand for land with increase in population and the impacts arising due to the interface with the various project activities.

a) Geographical location of the study area

The study area comprises 10km around the project site. The study area is falling in 53H/4 & 53D/16 of Survey of India Topographic sheet (1:50,000 Scale).

b) Data Collection and Quality Assurance

United States Geological Survey (USGS) satellite data SENTINEL 2B is being used for the analysis of Land Use and Land Cover around 10 km of the study area. Survey of India reference map on 1:50,000 scales have been used for the preparation of base map and geometric correction of satellite data. Ground truthing has been carried out to validate the interpretation accuracy and reliability of remotely sensed data, by enabling verification of the interpreted details and by supplementing with the information, which cannot be obtained directly on satellite imagery

3.8.2 Methodology

The land use/land cover map is prepared by adopting the interpretation techniques of the image in conjunction with collateral data such as Survey of India, topographical maps and census records. Image classification has been done by using visual interpretation techniques and digital classification using ERDAS software and ArcGIS software. The various activities for preparation of LULC include preprocessing, rectification, enhancements and classifying the satellite data for assessing the change in land use land cover due to proposed developmental activities. The imagery is interpreted and ground checked for corrections. The final map is prepared after field check. The different land use/land cover categories in the study area has been carried out based on the NRSC land use/land cover classification system

Flowchart showing the methodology adopted for land use/land cover mapping is provided as Figure 3.2

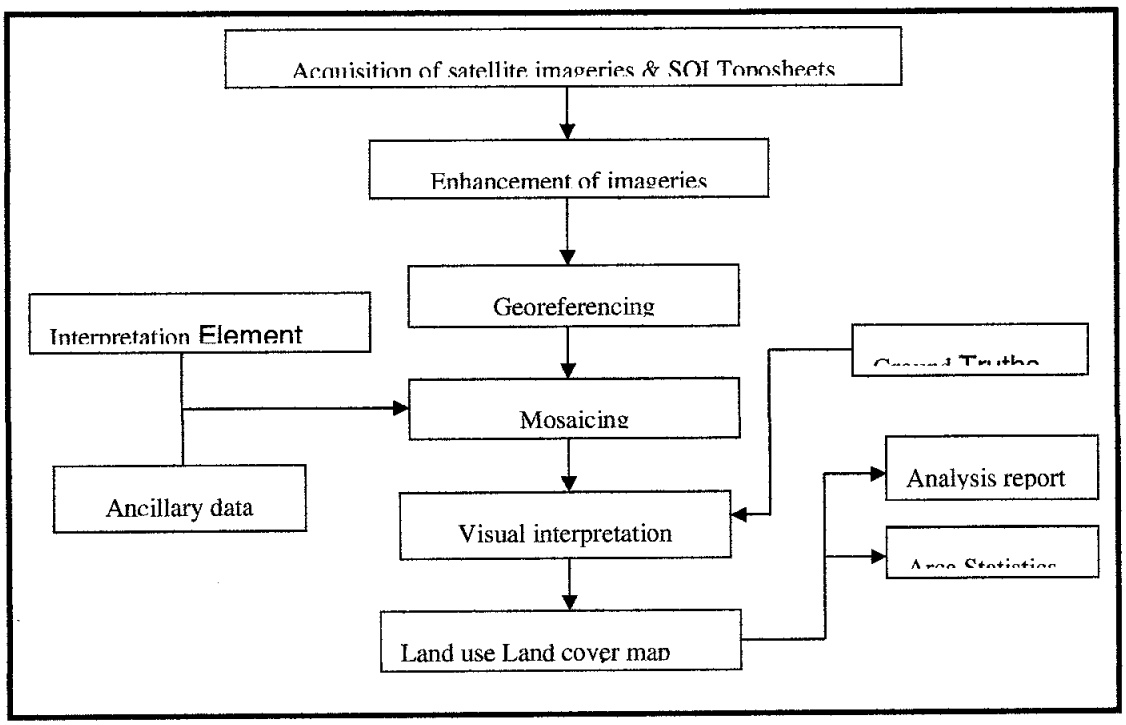


Figure 3.2. Flowchart showing the methodology adopted for LULC map

Land Use/ Land Cover Study

The land use land cover study has been done through image processing and visual interpretation technique to generate output of Land use/ Land cover map of study area on 1:50,000 scale. Land Use/Land Cover map of study area (10 km Buffer from project site). Land use map is presented in **Figure 3.3** Land Use Statistic (10 km) is presented in **table 3.11** and **figure 3.4**

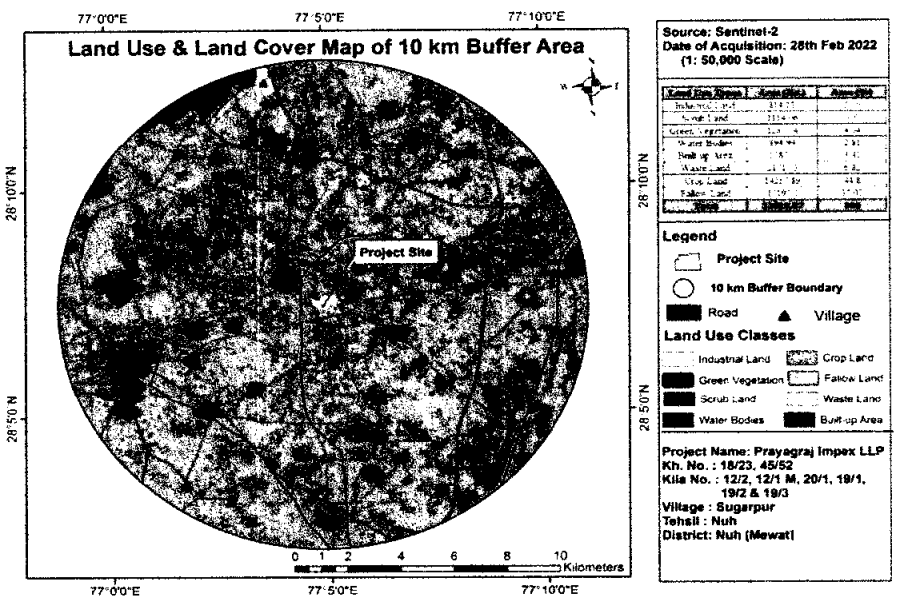


Figure 3.3: Land Use Map of 10 km Buffer Map

Table 3.11: Land Use Land Cover Area Statistic (10 km)

Land Use Types	Area (Ha.)	Area (%)
Industrial Land	814.11	2.55
Scrub Land	1114.06	3.5
Green Vegetation	1285.54	4.04
Water Bodies	894.94	2.81
Built-up Area	1087.7	3.41
Waste Land	2171.53	6.82
Crop Land	14257.89	44.8
Fallow Land	10193.1	32.03
Total	**31818.87**	**100**

The study area comprises of agricultural land including crop land 14257.89 ha (44.8%) and current fallow land 10193.1 ha (32.03%). Built-up land in the study area cover an area of 1087.7 ha (3.41%). The waste land in the study area cover an area of 2171.53 ha (6.82%). The water bodies is distributed around the study area covers an area of 894.94 ha (2.81%) and industrial land is distributed around the project site is 814.11 ha (2.55%). Scrub land in the study area cover an area of 1114.06 ha (3.5%). The green vegetation in the study area cover an area of 1285.54 ha (4.04%).

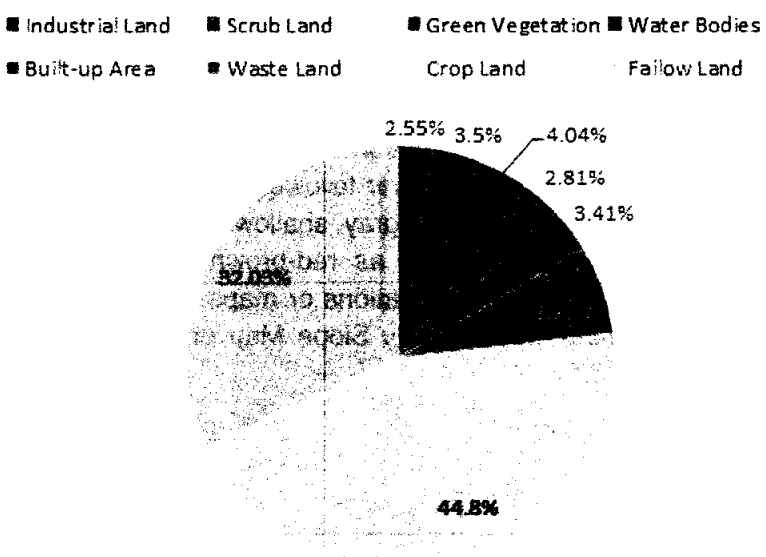
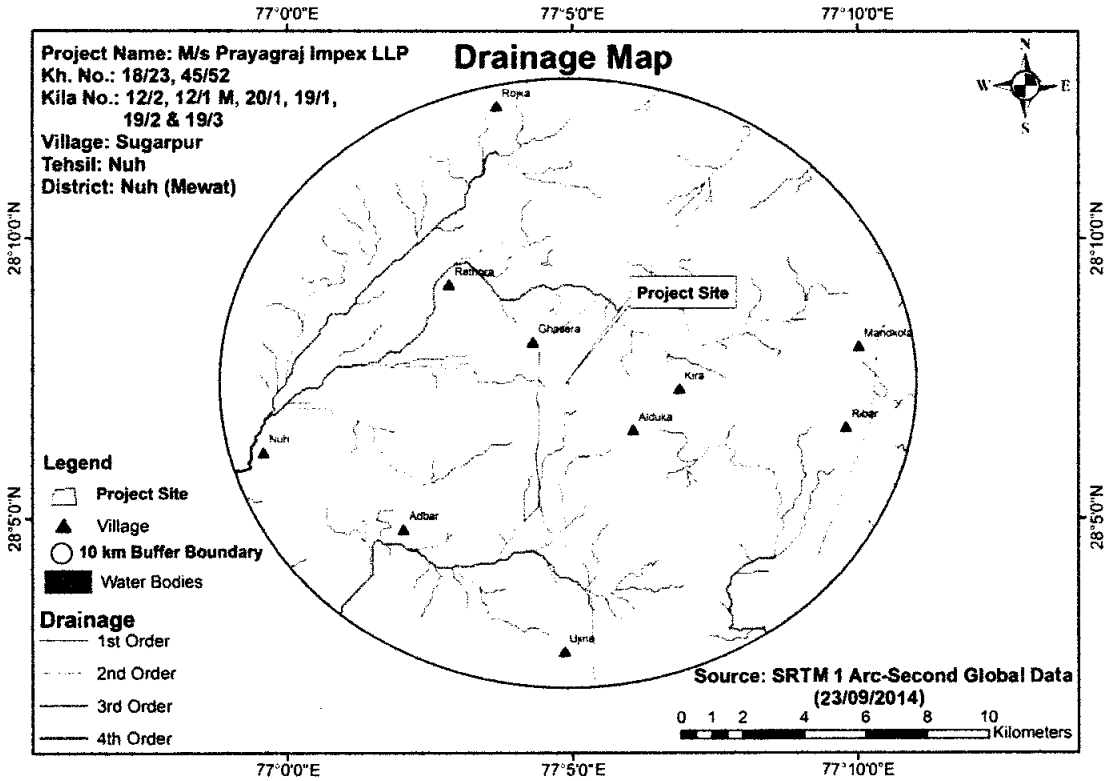


Figure 3.4: Pie Chart of Percentage Cover of Land.

3.8.3 Drainage Map

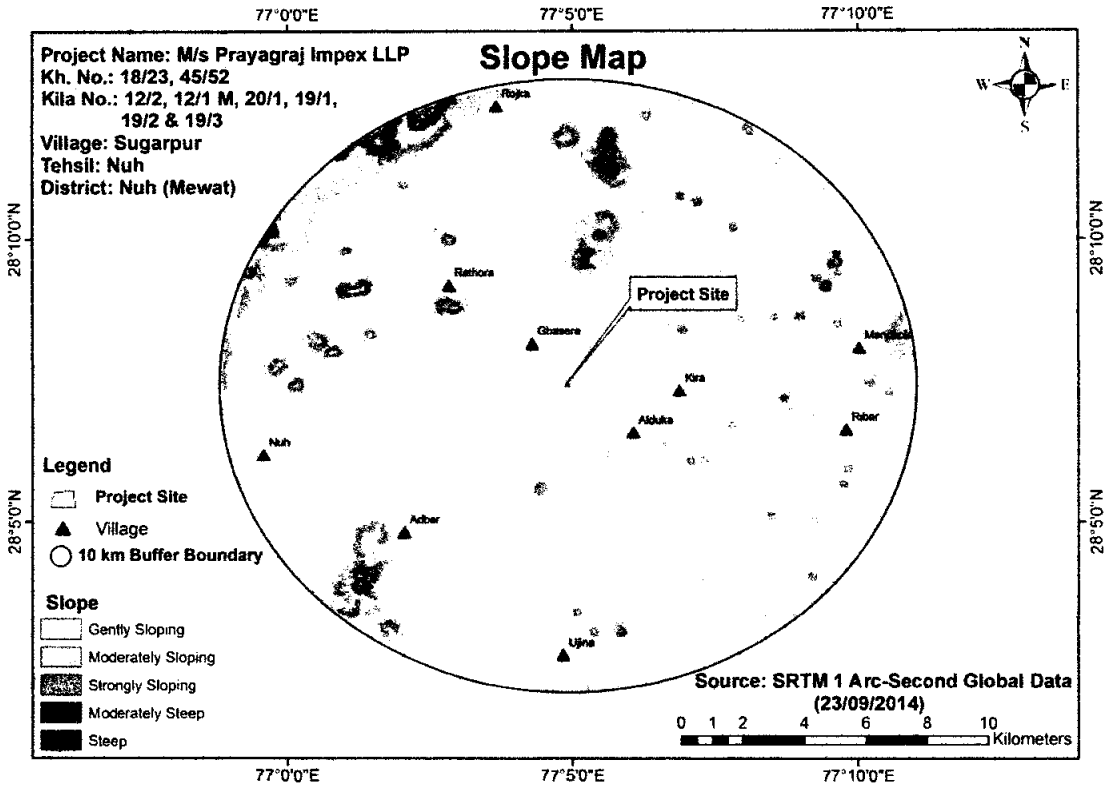
The Drainage map of the 10 Km radius with respect to project site is presented in **map 3.5** There is no major River within 500 m w.r.t. project site



Map 3-4: Drainage Map of the Study Region

3.8.4 Slope Map

Slope Map provides a colorized representation of slope, generated dynamically using a server-side slope function on the Terrain layer followed by the application of a colormap. Degree of slope represents flat surfaces as gray, shallow slopes as light yellow, moderate slopes as light orange and steep slopes as red-brown. This Map is only used for visualization, such as a base layer in applications or maps. A scaling is applied at small scales to generate appropriate visualization. Slope Map of studied region for Godavari project is presented in **map 3.6**



Map 3-5: Slope Map of the Study Region

3.8.5 Interpretation of Land Use Data

Based on the perusal of field visit and interaction with farmers, it is seen that over the period of time varieties of fruits, vegetable and fodder have been successfully grown in the study area are indicator of healthy & conducive land environment.

3.9 TRAFFIC STUDY

Proposed project connects with State Highway No.134 and National Highway No. 248 A. Proposed projectwill attract to commercial vehicles as a result traffic load will also increase on highways. Traffic load play a major role in polluting the air. To assess the traffic load, surveyors were appointed to survey for State Highway No. 134 near PHC Ghasera and National Highway No. 248 A near Ghasera village. Traffic data collected continuously for 24 hours by visual observation and counting of vehicles under three categories, *viz.*, heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined. Traffic study is conducted on State Highway No. 134 and National Highway No. 248A between 23 May to 29 May, 2022.

Table 3-12: Traffic Scenario

S. No.	Vehicles Distribution	No. of Vehicles/Day		Passenger Car Unit (PCU)	Total No. of Vehicle in PCU		Total No. of Vehicle (PCU)/Hour	
		SH-134	NH-248 A		SH-134	NH-248 A	SH-134	NH-248 A
1.	Cars	2192	3464	1.0	2192	3464	92	145
2.	Buses	1431	1702	3.0	4293	5106	179	213
3.	Trucks	954	1343	3.0	2862	4029	120	168
4.	Two wheelers	1122	1537	0.5	561	769	24	32
5.	Three wheelers	341	784	0.75	256	588	11	25
			6040	8830		10164	13956	426

Table 3-13: (a) Existing Traffic Scenario with respect to LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
SH-134	426	1250	0.34	B
NH-248A	583	3000	0.19	A

Table 3-14: (b) LOS

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/Average/Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

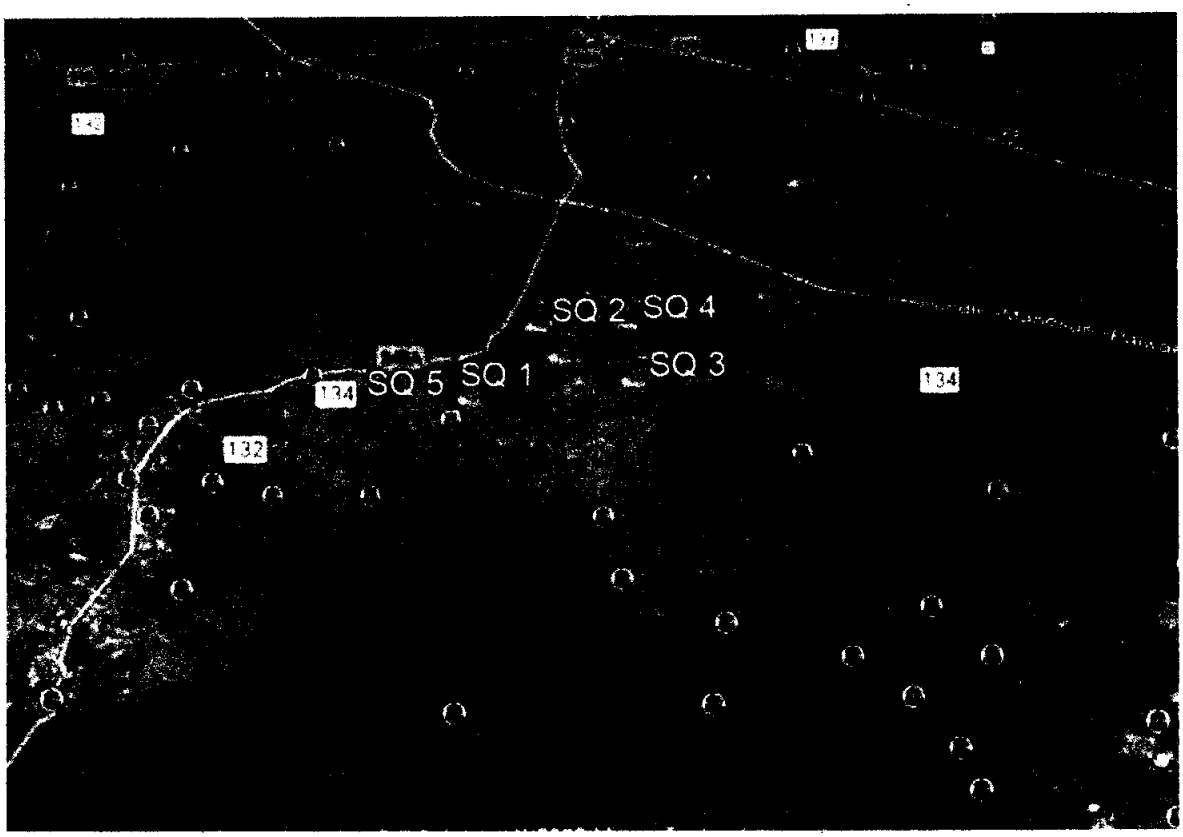
3.9.1 Interpretation of Traffic Study

Based on LOS value calculated from the survey report for State Highway No. 134 and its performance can be considered very good also National Highway 248A and its performance is Excellent. After reviewing their product list and raw material required by the industry and requirement of trucks for transportation, the number of vehicles that will increase is marginal. Thus, the chances of affecting the respiratory tract of human beings or other mammals will almost negligible due to dust and fugitive emissions

3.10 SOIL QUALITY

Four soil samples were collected from different locations within 10 km radius to assess the baseline status of soil. Analysis was carried out for physico-chemical parameters as well as the parameters to define the textural class. Soil samples were collected by using spade and core cutter and brought to the laboratory in polythene bags. Samples were collected from 20 cm depth. Methodology adopted for sampling and analysis was as per the book Soil Testing India (Agriculture Department), IS 2720 and laboratory validated procedure. Soil

sampling locations are presented in **map 3.7** and tabulated in **Table 3.15.** Results are presented in **Table 3.16.**



Map 3-6: Map Showing the Study Region with Locations for Soil

Table 3-15: Soil Monitoring Locations in the Study Area

Location code	Location name	Distance	Direction	Selection criteria	Latitude	Longitude
S1	At Project Site	-	-	On-site location	28° 7'23.86"N	77° 4'53.73"E
S2	Ghasera village	1.14 km	WWN	Crop land near village area	28° 7'52.08"N	77° 4'29.90"E
S3	Chhachera village	1.30 Km	ESE	Fallow land	28° 7'8.83"N	77° 5'51.79"E
S4	Chhapera village	1.81 Km	NE	Non-Agriculture land	28° 8'5.76"N	77° 5'36.48"E
S5	Manki Village	2.38Km	SSW	Agriculture Land	28° 6'33.27"N	77° 3'58.42"E

Table 3-16: Results of Soil Sample

S.No	Parameter	Units	Result				
			Location				
			SQ-1	**SQ-2**	**SQ-3**	**SQ-4**	**SQ-5**
1	Texture	-	Sandy Clay	Clay Loam	Clay Loam	Sandy Clay	Sandy Clay
2	Sand	%	46.73	43.56	34.89	48.55	48.63
3	Clay	%	38.05	36.54	37.81	30.35	39.25
4	Silt	%	15.37	20.29	27.30	21.10	12.12
5	pH(1:2.5 Suspension)	-	7.51	7.49	7.39	7.49	7.11
6	Electrical Conductivity	µmhos/cm	312.4	343.2	384.4	371.5	312.54
7	Potassium (as K)	mg/kg	161.15	271.10	201.08	212.24	128.43
8	Sodium (as Na)	mg/kg	209.54	127.15	290.14	101.03	201.45
9	Calcium (as Ca)	mg/kg	3806.46	3846.30	4549.55	3121.00	3205.41
10	Magnesium (as Mg)	mg/kg	487.15	462.76	577.45	389.18	487.13
11	Sodium Absorption Ratio	-	0.85	0.52	1.08	0.45	0.89
12	Water Holding Capacity	%	29.84	34.84	35.35	29.51	29.15
13	Total Kjeldahl Nitrogen (N)	%	0.076	0.089	0.063	0.071	0.09
14	Phosphorous (P)	mg/kg	67.35	77.56	77.86	51.65	73.19
15	Bulk Density	gm/cc	1.30	1.28	1.27	1.32	1.33
16	Organic Matter	%	1.28	1.56	1.13	0.61	0.91
17	Porosity	%	41.11	39.03	36.34	42.15	41.21
18	Moisture Content	%	14.56	17.87	11.80	8.40	20.04
19	Total Soluble Sulphate	mg/kg	85.97	106.69	108.75	227.52	195.32
20	Chloride	mg/kg	325.41	482.40	627.10	424.65	517.43

Summary of Soil Quality

The following interpretation is made based on visual observation and the test results found duringthe study period.

- The soils are categorized as sandy clay to clay loam based on different soil separates (clay loam to clay).
- The soils had low to moderate water holding capacity (29.15 to 35.35 %) and moderate porosity (39.03 to 41.21 %).
- The pH of the soil samples narrowly ranged from 7.11 to 7.51 during the study period.
- The soil EC also varied from 312.4 to 384.4 µmhos/cm.

- Among exchangeable basic cations predominance of calcium (38.64 to 32.05 mg /100 g soil) was seen followed by Mg (3.89 to 5.77 mg/100 g soil), Na (1.27 to 2.90 mg/100 g soil) and K (1.28 to 2.71 mg/100 g soil).
- Total Nitrogen was in the range of 0.063 to 0.09 % which is low to medium,
- Total Phosphorous was in the rage of 51.65 -77.86 mg/kg.
- The results relating to total Fe, Cu, Cr, B and Zn do not show alarming concentrations in different soil samples.

3.10.1 Interpretation of Soil Data

Based on soil analysis data it is concluded that soils are normal to saline. The soils are low to medium in nitrogen, low in phosphorus and high in potassium. The levels of total Cu, Cr, B and Zn are within the safe limits. However, for successful greenbelt development liberal quantity of organic manure (50 tons/ha) and double the quantity of recommended doses of N, and P and half the dose of K fertilizers should be applied. The soil at the project site requires amelioration. Apply acid forming amendments like sulphur pyrite for removal of excess sodium from the exchange complex with provision of adequate drainage. The soil should be periodically monitored for EC, pH and ESP.

3.11 WATER ENVIRONMENT

Physical, Chemical and Microbiological factors influencing the water quality are so interrelated that a change in any water quality parameter may trigger other changes in a complete network of interrelated variables. Selected water quality parameters for surface and ground water resources along with biological indicators within study region have been used for water environment and assessing the impact on it by proposed project. A study on water environment aspects of ecosystem plays an important role in environmental assessment to identify water related sensitive issues.

3.11.1 Reconnaissance

As a significant part of predefined framework of the present study, water samples were collected from selected locations. The reconnaissance survey was undertaken and monitoring locations were finalized based on:

- Presence, Location and uses of major Water Bodies in the region,
- Type and Location of Industrial/Residential areas, their intake and effluent disposal locations,
- Likely area that can represent baseline conditions.

3.11.2 Water Quality

With the start of water quality study, the water resources in the study area were divided into three categories for getting ideal upshot of baseline status of water quality of the region. These three categories as determined are:

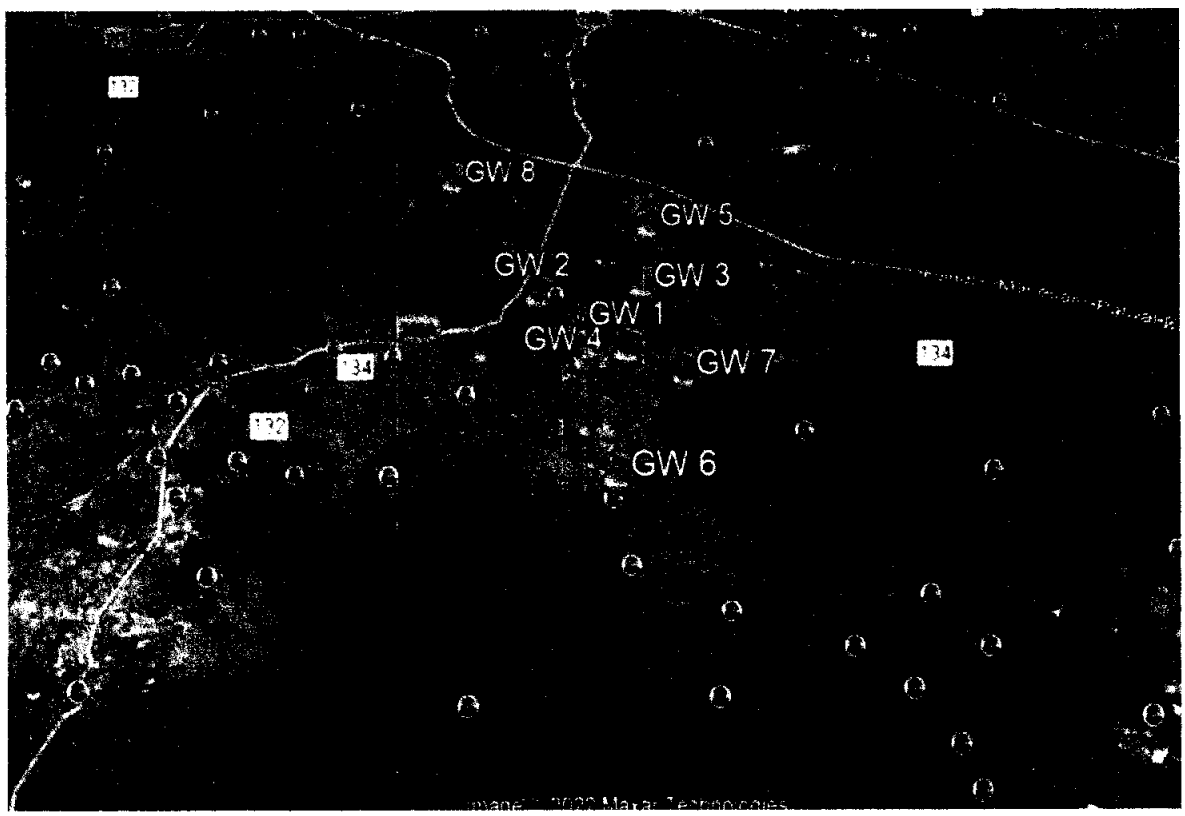
- Ground water resources (tube well, open well, springs etc.),
- Surface water resources including ponds, river, canals,
- Marine water

3.11.3 Sampling and Analysis

All the water samples were collected and analyzed as per "Standard Methods for Examination of Water and Wastewater", APHA 22nd edition, 2012. Water samples for the analysis of physico-chemical parameters were collected in plastic carboy and parameter wise preserved onsite as per the technique defined in the book of APHA, 22nd edition, 2012. Temperature, pH and DO were analyzed onsite and samples were brought to the laboratory for the analysis of remaining parameters.

3.11.4 Ground Water Resources

To assess the quality of ground water, samples were collected from 8 numbers of locations for the analysis of physico-chemical and microbiological parameters. Sampling locations are tabulated in table and figure. Some photographs showing the sampling activity is presented in **map 3.8** tabulated in **table 3.17** Analysis results are presented in **table 3.18**



Map 3-7: Map Showing the Study Region with Locations for Ground Water

Table 3-17: Ground Water Monitoring Locations in Study Region

Location code	Location name	Distance	Direction	Selection criteria	Latitude	Longitude
GW1	At Project Site	Borewell Inside project site	-	On-site location	28° 7'24.58"N	77° 4'56.58"E

GW2	Ghasera village	1.14 km	NW	Tapwater sample from nearest village habitation to the project site	28° 7'47.91"N	77° 4'20.67"E
GW3	Chhapera village	1.81 km	NE	Tapwater sample from village habitation	28° 8'9.47"N	77° 5'39.88"E
GW4	Chhachhera village	1.30 km	SE	Borewell sample from SBS	28° 7'7.34"N	77° 5'40.47"E
GW5	Kutabgarh village	3.46 km	NNE	Tapwater sample from Valmiki Temple	28° 9'12.41"N	77° 5'33.38"E
GW6	Bainsi village	4.05 km	SSE	Borewell sample from village habitation	28° 5'20.07"N	77° 5'54.48"E
GW7	Alduka Village	2.62 km	SE	Tapwater sample from Baba Balakdas Temple	28° 6'52.18"N	77° 6'26.31"E
GW8	Rithora	5.47 km	NNW	Tapwater sample from dense village residential area	28° 9'36.32"N	77° 2'40.83"E

Table 3-18: Results of Ground Water Analysis

S. No	Parameter	Test Method	Results								Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
			Location										
			GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8			
1	pH	IS:3025(Part-11)	7.98	8.01	8.31	8.05	8.04	8.09	8.01	8.20	-	6.5-8.5	-

2	Colour	IS:3025(Part-04)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	Haze n	5	15
3	Odour	IS-3025(Part-05)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	-	Agreeable	Agreeable
4	Temperature	IS:3025(Part-09)	31.3	30.1	31.5	32.8	33.3	32.1	33.3	32.1	°C	-	-
5	Turbidity	IS-3025(Part-10)	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	451	413	492	760	453	561	397	403	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	157.60	146.30	116.00	150.40	111.00	104.00	25.60	60.80	mg/l	75	200
8	Magnesium (as Mg)	IS:3025(Part-46)	48.10	37.90	39.30	93.31	39.00	42.00	32.00	39.00	mg/l	30	100
9	Chloride(as Cl)	IS:3025(Part-32)	76.32	125.24	367.00	398.10	312.10	211.53	378.00	410.00	mg/l	250	1000
10	Dissolved Iron(as Fe)	IS:3025(Part-53)	0.810	0.620	0.190	0.210	0.300	0.200	0.380	0.810	mg/l	0.3	No Relaxation
11	Fluoride(as F)	IS:3025(Part-60)	0.69	0.76	0.49	0.97	0.33	0.63	0.60	0.63	mg/l	1	1.5
12	Total Dissolved Solid	IS:3025(Part-16)	1786	1652	1411.0	1710.0	1567.0	1612.0	1567.0	1489.0	mg/l	500	2000
13	Phenolic Compound (as C_6H_5OH)	IS: 3025 (Part-43)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l	0.001 max	0.002 Max
14	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.2	1.0
15	Conductivity @25°C	IS:3025(Part-14)	2219	2013	1734	2714.3	1958.75	2015	1958.1	1861.3	µs/cm.	-	-
16	Total Suspended Solid	IS:3025(Part-17)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10	12	mg/l	-	-
17	Sulphate (as SO_4)	IS:3025(Part-24)	293.80	217.90	212.30	311.10	208.90	175.30	210.00	234.00	mg/l	200	400
18	Nitrate (as NO_3)	IS: 3025 (Part-34)	23.60	21.10	18.17	15.14	17.80	19.30	11.00	15.00	mg/l	45	No Relaxation
19	Alkalinity(as CaCO3)	IS:3025(Part-23)	484	456	456	512	354	465	213	336	mg/l	200	600
20	Cadmium (as Cd)	IS-3025(Part-41)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l	0.003	No Relaxation
21	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
22	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.05	No Relaxation

23	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.05	1.5
24	Total Ammonia	IS: 3025 (Part-34)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/l	0.5	No Relaxation
25	Zinc (as Zn)	IS:3025(Part-49)	0.42	0.64	<0.1	0.96	<0.1	0.45	<0.1	0.45	mg/l	5	15
26	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	0.1	0.3
27	Boron (as B)	IS:3025(Part-57)	0.12	0.16	<0.1	0.16	<0.1	<0.1	<0.1	<0.1	mg/l	0.5	1
28	Selenium (Se)	IS:3025(Part-56)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
29	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	0.05
30	Sodium (as Na)	IS:3025(Part-45)	45.79	75.14	12.92	196.07	11.74	12.82	11.74	12.82	mg/l	-	-
31	Potassium (as K)	IS:3025(Part-45)	29.65	66.25	7.88	144.62	8.33	8.78	8.33	8.78	mg/l	-	-
32	Phosphate (as P)	IS:3025(Part-31)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/l	-	-
33	Total Kjeldhal Nitrogen	IS:3025(Part-34)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/l	-	-

Table3.19 : Result of Bacterial Analysis

S.No	Parameter	Test Method	Results								Units	Requirements
			GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8		
1	E. coli	IS-1622	Not Detected(<2)	Not Detected(<2)	Not Detected(<2)	Not Detected(<2)	Not Detected(<2)	Not Detected(<2)	Not Detected(<2)	Not Detected(<2)	E.coli/100ml	Shall not be detectable in100 ml sample
2	Total Coliform	IS-1622	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	MPN/100ml	Shall not be detectable in100 ml sample

3.11.5 Summary of Ground Water Quality

The test results were compared with the Drinking Water Specification: IS: 10500, 1992 (Reaffirmed 2012) and it is summarized as under.

- pH was observed in the range of 7.98– 8.20.
- Turbidity was found in the range of<0.5 to 0.8.
- Total Dissolved Solid (TDS) were recorded in the range of 1411 - 1786 mg/L with

minimum at Chappera village and maximum at project location borewell

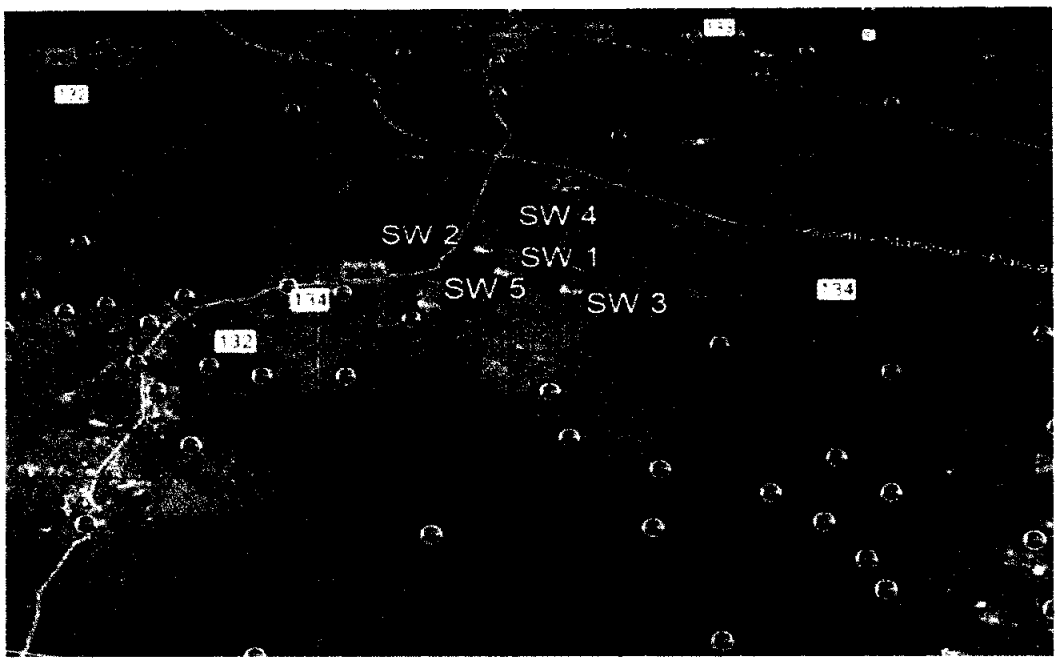
- Conductivity varies from 1734 to 2714.3 µmho/cm.
- Total Hardness was in the range of 397- 760 mg/L with minimum at Adulka village and maximum at Chachera village.
- Total Alkalinity was found in the range of 213-512 mg/L with minimum at Adulka village and maximum at Chachera village.
- Chloride was found in the range of 76.2-410 mg/L and Sulphate varies from 175.30-311.10 mg/L.
- As microbiological parameters MPN analysis was also carried out and it was found Nil.

3.11.6 Interpretation of Ground Water Quality Data

Based on comparison study of test results with drinking water norms, it is interpreted that water qualities of studied locations meet with the drinking water standards as per IS 10500: 2012 All villages and their water sources can be used in drinking, washing, bathing and irrigation purpose. To save the ground water from contamination and improving the quality, rainwater harvesting and ground water recharging may be helpful

3.11.7 Surface Water

To assess the quality of Surface water, samples were collected from 5 numbers of locations for the analysis of physico-chemical and microbiological parameters. Frequency of sampling was once during the study period. Sampling and analysis were carried out as per —Standard Methods for Examination of Water and Wastewater 22nd edition, 2012. Surface water sampling locations are presented in the **map 3.9** and **Table 3.20.** Analysis results are presented in **Table 3.21**



Map 3-8: Map Showing the Study Region with Locations for Surface Water

Table 3-20: Surface Water Monitoring Locations in Study Region

Location Code	Location Name	Distance	Direction	Selection Criteria	Latitude	Longitude
S1	At Project Site	-	-	On-site location	28° 7'23.86"N	77° 4'53.73"E
S2	Ghasera village	1.12	NWW	Crop land near village area	28° 7'52.08"N	77° 4'29.90"E
S3	Chhachera village	1.58	ESE	Fallow land	28° 7'8.83"N	77° 5'51.79"E
S4	Chhapera village	1.68	NE	Non-Agriculture land	28° 8'5.76"N	77° 5'36.48"E
S5	Manki Village	2.17	SSW	Agriculture Land	28° 6'33.27"N	77° 3'58.42"E

Table 3-21: Results of Surface Water Analysis

S.No	Parameter	Test Method	Results		Units	Tolerance Limit as per IS:2296				
			Ghasera	Bainsi		Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	8.16	7.36	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	29.5	28.1	°C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	5.3	34.6	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	401.4	558.1	µs/cm	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	21	48	mg/l	-	-	-	-	-
6	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	10.30	8.00	mg/l	2	3	3	-	-
7	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.4	7.4	mg/l	6	5	4	4	-
8	Calcium(as Ca)	IS:3025(Part-40)	27.40	25.60	mg/l	80	-	-	-	-
9	Magnesium(as Mg)	IS:3025(Part-46)	20.90	11.66	mg/l	24	-	-	-	-
10	Chloride(as Cl),Max	IS:3025(Part-32)	21.31	38.57	mg/l	250	-	-	-	600
11	Iron(as Fe),Max	IS:3025(Part-53)	<0.05	0.48	mg/l	0.3	-	50	-	-
12	Fluoride(as F),Max	IS:3025(Part-60)	0.16	0.21	mg/l	1.5	1.5	1.5	-	-

13	Total Dissolved Solid	IS:3025(Part-16)	251	435	mg /l	500	-	1500	-	2100
14	Colour	IS:3025(Part-04)	<5.0	<5.0	mg /l	10	300	300	-	-
15	Odour	IS-3025(Part-05)	Unobj.	Unobj.	-	Unobj.	-	-	-	-
16	Boron (as B)	IS:3025(Part-57)	<0.1	<0.1	mg /l	-	-	-	-	2
17	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	176.00	212.00	mg /l	300	-	-	-	-
18	Sulphate(as SO_4)Max	IS:3025(Part-24)	13.81	32.93	mg /l	400	-	400	-	1000
19	Phosphate (as P)	IS:3025(Part-31)	1.81	3.28	mg /l	-	-	-	-	-
20	Sodium (as Na)	IS:3025(Part-45)	14.21	25.84	mg /l	-	-	-	-	-
21	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	mg /l	0.5	-	-	-	-
22	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	<0.05	mg /l	0.05	0.05	0.05	-	-
23	Zinc (as Zn)	IS:3025(Part-49)	<0.1	0.18	mg /l	15	-	15	-	-
24	Potassium (as K)	IS:3025(Part-45)	3.85	4.53	mg /l	-	-	-	-	-
25	Nitrate (as NO_3)	IS: 3025 (Part-34)	<0.5	5.73	mg /l	20	-	50	-	-
26	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	<0.01	mg /l	0.01	-	0.01	-	-
27	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	mg /l	0.1	-	0.1	-	
28	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	mg /l	1.5	-	1.5	-	-
29	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	15.00	32.00	mg /l	-	-	-	-	-
30	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	mg /l	0.05	0.2	0.2	-	
31	Nitrite (as NO2)	IS: 3025 (Part-34)	<0.1	<0.1	mg /l	-	-	-	-	-
32	Total Kjeldahl Nitrogen	IS: 3025 (Part-34)	<0.1	<0.1	mg /l	-	-	-	-	-
33	Phenolic Compound (as C_6H_5OH)	IS: 3025 (Part-43)	<0.001	<0.001	mg /l	0.002	0.005	0.005	-	-
34	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	mg /l	0.2	1	1	-	-
35	Ammonia	IS: 3025 (Part-34)	<0.1	<0.1	mg /l	-	-	-	1.2	-
36	Aluminium (Al)	IS:3025(Part-55)	<0.01	<0.01	mg /l	-	-	-	-	-
37	Nickel (as Ni)	IS:3025(Part-54)	<0.01	<0.01	mg /l	-	-	-	-	-
38	Mercury (as Hg)	IS-3025(Part-48)	<0.001	<0.001	mg /l	0.001	-	-	-	-

39	Cobalt (as Co)	IS:3025(Part-2)	<0.5	<0.5	mg /l	-	-	-	-	-
40	Salinity	APHA	0.389	0.07	ppt	-	-	-	-	-
41	Petroleum Hydrocarbon	APHA	Not Detected	Not Detected	mg /l	-	-	-	-	-

Table 3-22: Bacteriological Analysis of Surface Water

S.No	Parameter	Test Method	Results		Units	Tolerance Limit as per IS:2296				
			Ghasera	Bainsi		Class A	Class B	Class C	Class D	Class E
1	Total Coliform	IS:1622	120	244	MPN/100ml	50	500	5000	-	-
2	F. Coliform	IS:1622	56	186	MPN/100ml	-	-	-	-	-

3.11.8 Summary of Surface Water Quality

The following description is based on the analysis of the samples:

- During the analysis pH of the samples was found in the range of 7.36-8.16
- TDS analysis was also carried out for surface water sample and it was found in the range of 251-435 mg/L.
- TSS was found in the range of 21-48 mg/L.
- Total Hardness ranges from 176-212 mg/L with maximum in the water sample of Bainsi village and minimum Ghasera village.
- DO is one of the important parameters to indicate towards the contamination of organic matter. DO level decrease as soon as organic contamination increases. During analysis DO was found in the both location is 7.4 mg/L.
- COD and BOD analysis was also carried out during the study period and results were found more than the expected value. Various literatures show that BOD should be less than 4.0 mg/L for the better survival of aquatic life.
- Total Nitrogen was found in the range of <1.0mg/L.
- Heavy metal analysis was also carried out.
- MPN test was also carried out for this surface water sample and it was found positive. It indicates towards the faecal contamination in surface water body.

3.11.9 Interpretation of Surface Water Quality Data

Based on test result data comparison study, it is interpreted that River water quality does not meet with drinking water norms as per IS 10500:2012. Results of BOD have been found more than the expected value and range of norms, which indicates that water has been contaminated with organic matter. It may be due to directly or indirectly contamination with sewage and effluent. This water should not be directly used in drinking purpose but it can be used in drinking after conventional treatment followed by disinfection. This water can be used in irrigation and other domestic purposes.

3.12 ECOLOGY AND BIODIVERSITY

Mainly two types of Vegetation cover are on the earth surface. One is self-growing and another is cultivated. Plants are renewable resource and useful to living organism in many ways. It is

therefore the role of man in manipulating and changing vegetation population. Due to lack of awareness deforestation is occurring which in turn is responsible for imbalance of ecosystem. The main objective of the ecological survey is aimed to find out baseline status of flora and fauna of the study region. An ecological survey of the study area was conducted particularly with reference to listing of species and assessment of the existing baseline ecological (terrestrial and marine ecosystem) conditions in the study area.

3.12.1 Methodology Adopted for the Study of Flora and Fauna

Study area:10 km radii w.r.t. project site.

Study period: 1st March 2022 to 31st May 2022

List of villages for Primary Survey: Ghasera, Bainsi, Manki, Chachera, Chapera etc.

Table 3-23: Mode of Data Collection and Survey

S. No.	Aspect	Data	Mode of Data Collection	Parameters Monitored	Remarks
1.	**Terrestrial Ecology**	Primary data collection	By Field Survey The following references has been used: • Misra, R. (2013, reprinted in India). Ecology Workbook. Scientific Publishers. (Page 31 to 45). • B. Welsh, H.H., Jr. 1987. Monitoring herpetofauna in woodlands of north western California and south west Oregon: a comparative strategy. Pp. 203-213. • C. Welsh, H.H. Jr. and Lind, A. 1991. The structure of the herpetofaunal assemblage in the Douglas-fir/hardwood	**For Floral diversity, Vegetation measurements:** Tree, Shrub, Herbs, Grasses, Climbers, Cultivated plants in the study area, Floristic composition of the study area, Medicinal plants of the study area, Status of the forest, their category in the study area, Rare and endangered flora in the study area. Endemic plants in the study area. **For Fauna in the study area:** -Reptiles, -Amphibians, -Birds,	Random survey, opportunistic observations, diurnal bird observation, active search for reptiles, faunal habitat assessment, active search for microhabitat, scats, foot prints, animal call, pug marks, debarking sign, Nesting, Claws, Dung, etc. and information from local villagers.

			forests of northwestern California and south western Oregon. Pp: 395-411. • D. Hutto, R.L., S.M. Pletsechel and P. Hendrick. 1986. A fixed radius point count method for non-breeding season use. The Auk. 103: 593-602. • E. Allen, L., Engeman, R. and Krupa, H. 1996 Evaluation of three relative abundance indices for assessing dingo population. Wildlife Research. 23: 197-206. • F. Thommpson, I.D., Davidson, I.J., O' Donnell, S. and Brazeau, F. 1989. Use of track transects to measure the relative occurrence of some arboreal mammals in uncut forest and regeneration stands. *Canadian Journal of Zoology.* 67:1816-1823.	-Fresh water fishes -Mammals, -Butterflies. Rare and Endangered fauna in the study area, Endemic fauna in the study area, Wild life and their conservation importance in the study area.	
		Secondary data collection	• Data of Fisheries department.	Interpretation of secondary data for Ecological	Bentham and Hooker, 1862-1883; Hunter, 1879; Dixit, 1984;

			• Literature like research papers, books published by research/academic Institutions. • Reports (Research reports, previous EIA reports etc.)	Sensitive Areas such as national forests, wild life sanctuaries, lakes, ravines, hills, hillocks and reserve forest, vegetation, type, importance etc.	Ghosh *et al.,* 2004; Lushington, 1915; Wilson and Reeder, 1993; BirdLife International, 2000; BirdLife International, 2004a, b; Wilson and Reeder, 2005; BirdLife International, 2010; Kumar and Srivastava, 2012; Kumar, 2013; Kumar *et al.,* 2013; Kumar and Aggarwal, 2013a,b). The status of individual species was assessed using the revised IUCN/SSC category system (WCMC, 1988; IUCN, 1994; WCMC, 2000; IUCN, 2001, 2003, 2008, 2010.
2.	**Evaluation of Ecological sensitivity**	Secondary	Review and Discussion	Wild life importance, Floral Endemicity, Faunal Endemicity, State of Terrestrial vegetation, Conservation importance, Legal status (National park, Wild life sanctuary, Reserve forest, Agricultural lands) Lakes /reservoirs/dam, Natural lakes and Swamps, Breeding ground of Migratory and Residential birds.	-

Observations: The prevailing vegetation cover over the area is mainly of tropical dry deciduous forest as per the Champion and Seth (1968) "Classification of forest type of India". The vegetative community of the area is mainly under open scrub forest and because of urbanization area is usually surrounded with planted varieties. The dominant species are Japanese maples (*Acer palmatum*), Trident maples (*Acer buergerianum*), neem (*Azadarachta indica*), Gulmohar (*Delonix regia.*), Safeda (*Eucalyptus*), Carrot grass (*Parthenium sp.*), etc. The prominent grass is *Cynodon dactylon*. No threatened, rare, endangered or endemic species were observed during the survey in this project area. There is no protected forest area in this zone.

Table 3-24: List of Trees in the Study Area

S.No.	Local Name	Scientific Name
1.	Neem	*Azadirachta indica*
2.	Safeda	*Eucalyptus*
3.	Dhatura	*Datura sp.*
4.	Arandi	*Ricinus communis*
5.	Peepal	*Ficus religiosa*
6.	Bougainvelia	*Bougainvelli*
7.	Bottle palm	*Beaucarnea recurvata*
8.	Amaltas	*Cassia fistula*
9.	Shisham	*Dalbergia sissoo*
10.	Bottle brush	*Callistemon lanceolatus*
11.	Carrot grass	*Parthenium sp.*
12.	Gulmohar	Delonix regia
13.	Oak	*Quercus sp*
14.	Japanese maples	*Acer palmatum*
15.	Trident maples	*Acer buergerianum*
16.	Japanese maples	*Acer palmatum*
17.	Trident maples	*Acer buergerianum*

Table 3-25: List of Mammals in the Study Area

S. No.	Scientific Name	Common Name

1.	Indian palm squirrel	*Fumambulus pennanti*
2.	Cat	*Felis sp.*
3.	Dog	*Cuon sp.*
4.	Cow	*Bos sp.*
5.	Horse	*Equs sp.*
6.	Rat	*Rattus rattus*

Table 3-26: List of Brids in the Study Area

S.No.	Scientific Name	Common Name
1	Crow	*Corves splendens*
2	Sparrow	*Passer domesticus*
3	Baya	*Ploceus philippinus*
4	Parrot	*Psittacula krameri*
5	Peafowl	*Pavo cristatus*
6	Pigeon	*Columba livia*
7	Egretta	*Egretta sp*
8	Myna	*Acridotheres tristis*

Table 3-27: List of Reptiles in the Study Area

S. No.	Scientific Name	Common Name
1	Indian garden lizards	*Calotes versicolor*
2	House lizards	*Hemidactylus sp.*

3.12.2 Interpretation on Ecology

Dominant flora of the study region is Neem, Gulmohor, Mango etc. Area is rich with floral diversity. Natural vegetation of study area condition is good while mammals' density is very low. Main Aves species are found are Parrot, Crow, Pigeon, Sparrow etc. There is no threatened or endangered species or schedule -1 species were observed in study region.

3.13 SOCIO-ECONOMIC ENVIRONMENT

The rapid industrialization of the study region has greatly influenced the socio economy and health environment in the villages. Increasing industrialization and population density has increased pressure on resources, civic amenities and public infrastructure. Economic conditions of the local people have improved with the increasing industrialization and greater employment opportunities. The Socio-Economic environment includes demography structure, population density, literacy level, and employment levels. The data establish a baseline for the prediction of likely impacts of the proposed activity on the socio-economic environment. Secondary information pertaining to the study area villages was collected from Government Agencies, Census data for the year 2011, and statistical abstracts to compile the socio-economic data.

Reconnaissance: The study of socio-economic environment includes demographic structure and availability of basic amenities *viz.* housing education, health and medical services, water supply, sanitation, transportation, communication and power supply.

Study Area: The study area was defined as an area within 10 km radius around the proposed project site. Total 74 villages (rural) and Nuh City as major urban city are present in study area as per census 2011. Designation of impact zone is based on the EIA guidelines considering the size and operation of the project. The baseline study focuses on the community around the project site.

Methodology applied for selection of sample and data collection

The methodology which is applied for primary source of data collection i.e., gathering data through field survey for socio-economic environment is depicted below:

Sampling Method

A judgmental and purposive sampling method was used for choosing respondents of various sections of the society i.e., Sarpanch, adult males and females, teachers, medical practitioners, businessmen, agriculture laborers, unemployed group etc. Judgmental and purposive sampling method includes the right cases from the total population that helps to fulfill the purpose of research needs.

Data Collection Method

For the process of data collection through primary source certain methods are used among that are:

Field Survey and Observations

Field survey and observations is made at each sampling village and the socioeconomic status of that region is studied. Visits are made at hospitals, primary health centers and sub-centers to know the health status of the region. Various governmental organizations such as statistical department, department of census operations are visited to collect the population details of that region.

Interview Method

Structured interview method is used to collect data regarding the awareness and opinion from the samples selected of the various socio- economic sections of the community. Structured interviews involve the use of a set of predetermined questions that includes fixed and alternative questions. The questionnaire mainly highlights the parameters such as income, employment and working conditions, housing, food, water supply, sanitation, health, energy, transportation and communication, education, environment and pollution to assess the standard of living of that particular region and general awareness, opinion and expectation of the respondents about the proposed project. Interview method helps to collect more correct and accurate information as the interviewer is present during the field survey.

Selection of Sample size (respondent) for Primary Data Collection

The sample size has been determined by following formula:

Sample size (n)

$$n = \frac{Nx \ \frac{[z^2xp(1-p)]}{e^2}}{[(N-1) + \frac{z^2xpx(1-p)}{e^2}]}$$

N= Population size of study area

z= Critical value of normal distribution at the required confidence level (1.96 as Z-value taken from Z-table for 95% confidential)

p= Sample proportion (generally 50% taken): 0.5

e= Margine of Error (generally 5% taken): 0.05

Total population of rural area is 1,76,817 consisting male 93152 and female 83665 from rural and urban and total population of urban area is 287101. Hence N will be 176817 for sample size from rural area as project site situated in rural. The values for calculating the sample size given below:

N	176817
N-1	176816
z	1.96
z^2	3.8416
p	0.5
1-p	0.5
e	0.05
e^2	0.0025

After putting following values in above equation (sample size), we get n= 384.16 say 384.

The total respondents selected for interview are 400 for more accuracy instead 384. Total of 50 Respondent were interviewed at their respective households by way of questionnaires and 350 respondents were discussed in group discussion at the offices of village Panchayat in presence of village head, designated as Sarpanch about the demographic features as well as socio-economic anticipated impacts by the said project. By tabulation and evaluating the responses of respondents by taking mean as statistical variate for inference about the demographic profile of the area. The respondents were asked for their awareness / opinion about the project and also of their opinion about the impacts of the project which are an important aspect of socio-economic environment, viz. job opportunities, education, health care, housing, transportation facility and economic status.

Selection of Villages (Samples) for Primary Survey

As per thumb rule, at least 10 % population size should be selected for the random sampling. For taking into consideration 10% of 74 villages coming out 8 village. Hence for more accuracy or confidence level we have selected 8 villages at random among 74 villages around project site. 400 respondents (50 Individual and 350 in group) have been selected from these 8 villages. The list of villages is listed below in **table:3.28**

Table 3.28. List of Villages for in Study Area (10 km radius)

S.No.	Name of Village	S.No.	Name of Village
1.	Adbar	38.	Kherla
2.	Akbarpur	39.	Kherli Kanka
3.	Alduka	40.	Kherli Dausa
4.	Babupur Nuh	41.	Kherli Nuh
5.	Badhelaki	42.	Khor
6.	Badka Alimudin	43.	Khori Nuh
7.	Bainsi	44.	Kira
8.	Bajarka	45.	Kultajpur Kalan
9.	Barota	46.	Kurali Sohna
10.	Barwa	47.	Kurthla
11.	Basai	48.	Mahwan
12.	Biwan	49.	Mailawas
13.	Chandanki	50.	Manaki
14.	Chandeni	51.	Mandikhera
15.	Chhachera	52.	Maraula
16.	Chhapera	53.	Murad Bas
17.	Chhapera	54.	Naushera
18.	Dhanduka	55.	Nizampur Nuh
19.	Dhir Dhaunka	56.	Qutabgarh
20.	Dubalu	57.	Rahuka
21.	Gajarpur	58.	Raipuri
22.	Gangauli	59.	Raisika

23.	Gehbar	60.	Ranika
24.	Ghasera	61.	Rethora
25.	Golpuri	62.	Rewasan
26.	Hasanpur Nuh	63.	Rojka
27.	Hilalpur	64.	Rupaheri
28.	Hiranthla	65.	Sadain
29.	Hussainpur	66.	Salaheri
30.	Indana	67.	Salamba
31.	Indri	68.	Satputiaka
32.	Jogipur	69.	Sonkh
33.	Kairaka	70.	Sudaka
34.	Kanwarsika	71.	Tain
35.	Adbar	72.	Tapkan
36.	Khalilpur	73.	Tarakpur
37.	Khanpur Nuh	74.	Ujina

Baseline Status

The study area of the proposed project falls in Nuh (Mewat). In Mewat District, the total number of households is 160280 and total population as per census of 2011 is 1089263, however total population of study area is 176817. The total male population is 93152 i.e., 52.68% whereas the female population is 83665 i.e., 47.31% for study area. Most of the population in the study area belongs to the category of Main workers, which includes Cultivators, Agriculture Laborers, workers those engaged in Household industries, Construction activities, Forestry and other allied activities. Main sources of water supply are wells, hand pumps, ponds/open tanks and taps in few villages. Market facilities are available in few villages. Communication facilities in the villages are quite good with all villages having Branch Post offices, Telephone facility. Police stations exist in all the surroundings. The latest available data has been complied to generate the existing socio-economic scenario of the study area. Information on socio-economic profile was collected from the Primary Census Abstract CD 2011 including the population details of the region.

About District Mewat

Nuh district is one of the 22 districts in the Indian state of Haryana. It has an area of 1,507 square kilometres (582sq mi) and 10.9 million population. It is bounded by Gurgaon district on the north, Rewari district on the west and Faridabad and Palwal districts on the east. It is predominantly populated by the Meos, who are agriculturalists, and Muslims. According to the 2011 census, Nuh district had a population of 1,089,406, roughly equal to the nation of Cyprus or the US state of Rhode Island. This gives it a ranking of 420th in India (out of a total of 640). The district had a population density of 729 inhabitants per square kilometre (1507/sq km). Its population growth rate over the decade 2001-2011 was 37.94% It has a sex ratio of 906 females for every 1000 males, and a literacy rate of 56.1%. According to the Census of India 2001, the total population of the district was 993,617 (including Hathin Block of district Palwal) of which 46,122 (4.64%) lived in urban areas and the major chunk 947,495 (95.36%) of the population lived in rural areas. Out of the total population of 993,617, there are 524,872 males and 468,745 females. The SC population is around 78,802. The total numbers of households are 142,822 out of which 135,253 (95%) are in rural areas and remaining 7,569 (5%) are in urban areas. The total number of BPL households are 53,125 including Hathin Block. The main occupation in the district is agriculture along with allied and agro-based activities. The Meos are the predominant population group and are all agriculturists. Agriculture is mostly rain-fed except in small pockets where canal irrigation is available. Agriculture production measured in terms of crop yield per hectare is low in comparison to the other districts of the State. Animal husbandry, particularly dairy, is the secondary source of income for the people and those who live closer to the hilly ranges of Aravali also keep sheep and goats. Milk yields are not so low, however, due to heavy indebtedness, most of the farmers are forced to sell the milk to the lenders at lower-than-normal price, which drastically reduces their income from the milk. Towns like Punhana, Pinangwan, Ferozepur Jhirka, Taoru and Nuh are major hub of retail shops and acts as the backbone of day-to-day life in area. The district also has an MMTC-PAMP factory located in the Rojka-Meo industrial estate. In 2011, Mewat had population of 1,089,263 of which male and female were 571,162 and 518,101 respectively. In 2001 census, Mewat had a population of 789,750 of which males were 415,947 and remaining 373,803 were females. Mewat District population constituted 4.30 percent of total Maharashtra population. In 2001 census, this figure for Mewat District was at 3.74 percent of Maharashtra population. There was change of 37.93 percent in the population compared to population as per 2001. In the previous census of India 2001, Mewat District recorded increase of 45.67 percent to its population compared to 1991.

District Nuh has been divided into nine circles. Circle Agriculture Officer supervises and is assisted by Agriculture Development Officer. Training and visit system is in the progress in the department since 1974. One Agriculture Development officer is appointed on an average 800 affective operating farm families. Circle Agriculture Officer is closely and effectively guiding usually 8 Agriculture Development officers. Each circle of Agriculture Development officer is divided into 8 groups. Each group is visited by A.D.O. on one of the 8 days assigned in each fortnight to regular, fixed visits.

The Agriculture Department guides the farmers in the application of latest agricultural techniques which include intensive method of cultivation for higher production, new cropping

patterns, preparation of crop plans, control of various pests and diseases affecting agricultural crops, use of fertilizers and improved seeds and laying out demonstration plots to show the cultivators the superiority of the strains and agronomic practices. The Agriculture Inspectors impart training and education to the farmers in their respective areas on matters relating to improved techniques and better farm management.

Agriculture is the mainstay of the bulk of the population (86%) of the Nuh District. Rapid advances have been made in this field after the formation of the Haryana in 1966. With the provision of better irrigational and other facilities, the primitive agricultural practices are fast yielding place to modern mechanised farming and agricultural production is continually increasing.

Agriculture is the chief occupation of the people of the district. After Independence, most of the area fit for cultivation has been brought under the plough. The district made remarkable progress in agriculture after the formation of Haryana in November 1966.The production of foodgrains has increased from 278.30 thousand tones in 74-75 to 954 thousand tonnes in year 96-97.

Village

The basic unit for rural areas is the revenue village which has definite surveyed boundaries. The revenue village may comprise of one or more hamlets but the entire village is treated as one unit for presentation of data. There are 74 villages (rural) and Nuh City in the study area.

Demographic Structure

Demographic structure of the study area was estimated for the selected parameters as households, population, sex ratio, scheduled caste, scheduled tribes, literacy from primary census abstract, CD 2011.

Demographic Profile of Villages

The details of the household, total population, male, female, literacy etc. is shown in table below.

Table 3.29. Demography of study area (10 Km radius)

Village Name	No. of House Hold	Total Population	Male	Female	Children	Literate
Adbar (106)	836	6564	3395	3169	1730	2315
Akbarpur(128)	360	2229	1156	1073	590	766
Alduka (203)	662	3787	2091	1696	458	2382
Babupur Nuh (147)	165	1180	634	546	273	415
Badhelaki(176)	76	554	282	272	125	291
Badka Alimudin(92)	455	2788	1503	1285	748	1025
Badka Alimudin(92)	455	2788	1503	1285	748	1025
Bainsi (204)	527	3756	1980	1776	760	1607
Bajarka (202)	173	1245	660	585	305	391

Barota(178)	244	1314	711	603	175	859
Barwa(90)	213	1543	805	738	403	526
Basai(86)	320	2164	1091	1073	512	929
Biwan(98)	138	957	493	464	244	408
Chandanki(213)	259	1788	977	811	434	707
Chandeni(158)	639	4222	2260	1962	968	2050
Chhachera (200)	155	1048	555	493	170	581
Chhapera (167)	157	1151	623	528	324	456
Chhapera(198)	432	2577	1408	1169	352	1592
Dhanduka (151)	156	982	523	459	227	465
Dhir Dhaunka(171)	86	616	329	287	113	276
Dubalu(194)	92	587	324	263	66	344
Gajarpur(166)	125	884	500	384	233	383
Gangauli(195)	414	2320	1247	1073	343	1348
Gehbar (114)	70	450	246	204	65	262
Ghasera(161)	2052	15147	7968	7179	3894	4939
Golpuri (143)	464	3137	1636	1501	779	1217
Hasanpur Nuh(16)	216	1382	735	647	353	610
Hilalpur(183)	119	652	347	305	95	356
Hiranthla(164)	176	1334	692	642	301	556
Hussainpur (149)	56	418	218	200	107	177
Indana(241)	542	3599	1917	1682	810	1584
Indri(197)	1024	6597	3446	3151	1201	3540
Jogipur (105)	182	1306	698	608	370	485
Kairaka (144)	424	3020	1622	1398	690	1252
Kanwarsika(175)	310	1973	1003	970	448	1061
Khalilpur(193)	653	4290	2263	2027	807	2285
Khanpur Nuh(13)	173	1283	636	647	362	530
Kherla (109)	651	4656	2429	2227	1009	2256
Kherli Kankar(169)	219	1632	842	790	403	718
Kherli Dausa(196)	190	1177	618	559	207	672
Kherli Nuh(14)	219	1519	778	741	430	544
Khor(84)	141	960	517	443	256	377
Khori Nuh (116)	27	189	103	86	54	83
Kira (199)	117	757	400	357	126	459

Kultajpur Kalan(62)	74	531	285	246	120	203
Kurali Sohna(89)	237	1822	971	851	394	609
Kurthla (205)	417	2203	1171	1032	333	1514
Mahwan(88)	119	793	433	360	227	262
Mailawas(163)	57	368	186	182	49	256
Manaki (153)	94	627	334	293	156	254
Mandikhera(53)	456	2765	1472	1293	583	1390
Maraula(172)	195	1343	664	679	344	625
Murad Bas (112)	314	2236	1175	1061	478	1077
Naushera (142)	507	3754	1950	1804	943	1004
Nizampur Nuh (107)	296	2014	1057	957	574	666
Qutabgarh(162)	79	386	196	190	67	232
Rahuka(182)	162	1171	609	562	261	397
Raipuri (148)	284	2263	1181	1082	534	921
Raisika(174)	52	340	183	157	77	192
Ranika(60)	196	1489	737	752	347	813
Rethora(165)	288	2091	1079	1012	493	937
Rewasan (168)	477	3543	1845	1698	918	1329
Rojka(173)	617	3935	2080	1855	1035	1409
Rupaheri(170)	65	397	208	189	64	175
Sadain(94)	163	1181	611	570	319	378
Salaheri (155)	722	5467	2841	2626	1410	2175
Salamba (154) (CT)	863	5727	3052	2675	1331	2313
Satputiaka (150)	96	683	372	311	163	322
Sonkh(100)	243	1735	911	824	492	550
Sudaka (145)	1093	8147	4285	3862	2048	2769
Tain (152)	694	5015	2609	2406	1239	1872
Tapkan(96)	438	3211	1692	1519	812	1150
Tarakpur (146)	94	661	372	289	166	276
Ujina (141)	1388	8397	4427	3970	1418	5218
Total	**25944**	**176817**	**93152**	**83665**	**40463**	**76392**

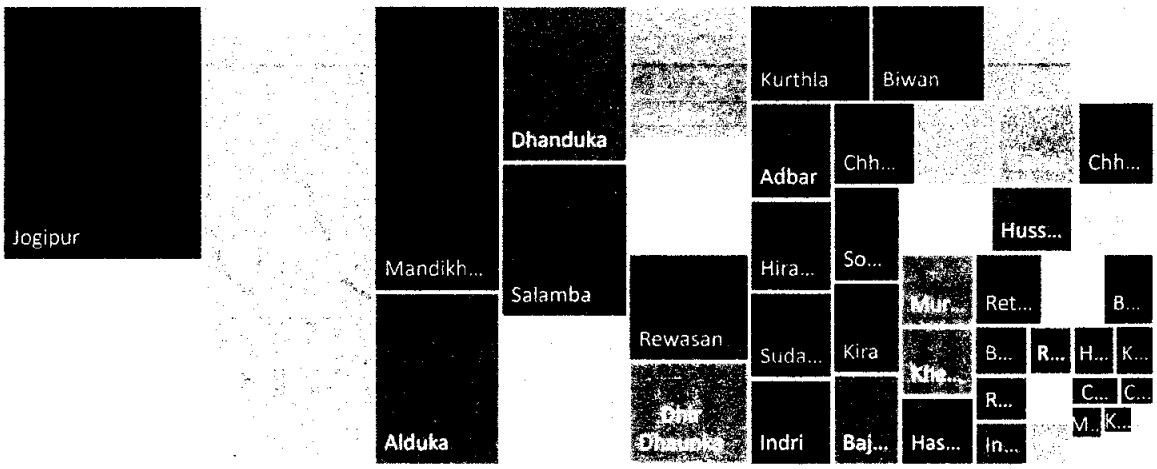


Figure 3.5. Population of SC & ST

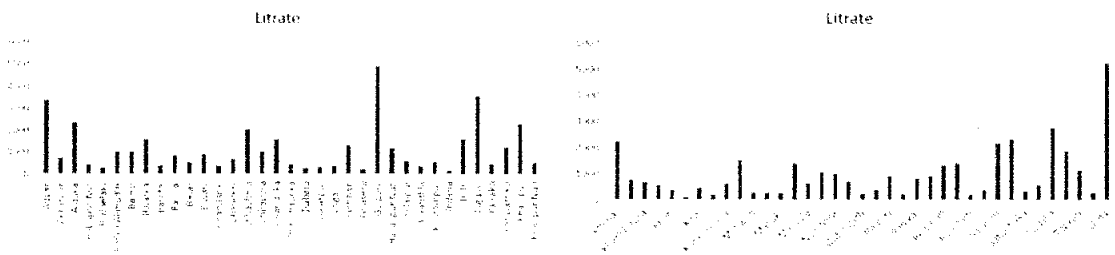
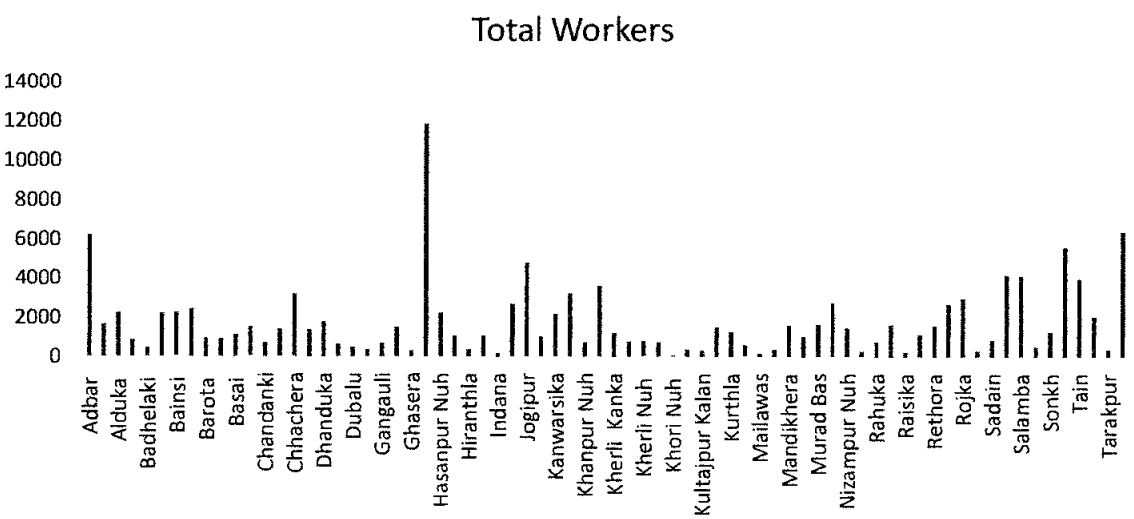


Figure 3.6. Educational Profile of nearby villages



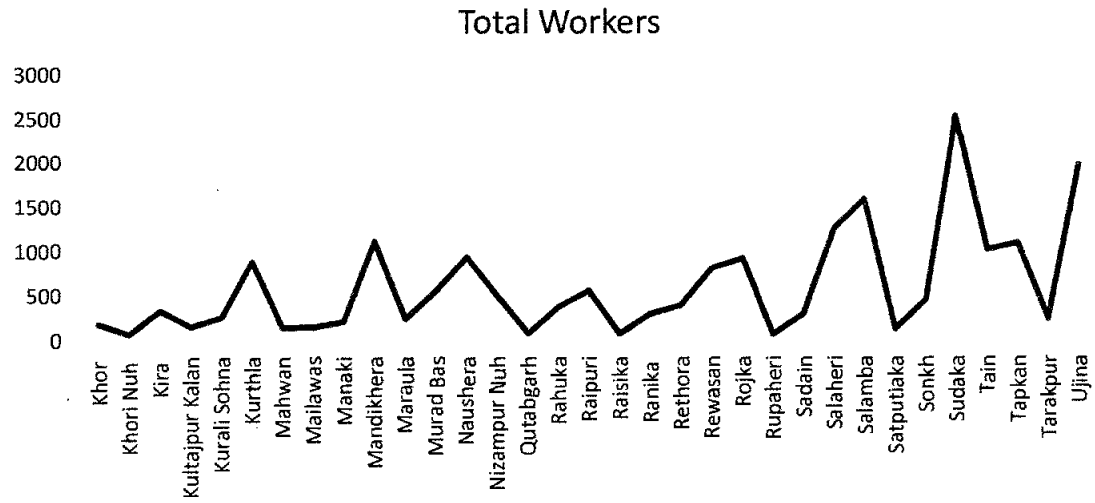


Figure 3.7. Occupational Profile of nearby villages

Table 3.30. Demography of SC & ST

Village Name	Total SC Population	SC Male	SC Female	Total ST Population	ST Male	ST Female
Adbar (106)	161	83	78	0	0	0
Akbarpur(128)	10	4	6	0	0	0
Alduka (203)	444	246	198	0	0	0
Babupur Nuh (147)	0	0	0	0	0	0
Badhelaki(176)	0	0	0	0	0	0
Badka Alimudin(92)	135	75	60	0	0	0
Badka Alimudin(92)	135	75	60	0	0	0
Bainsi (204)	123	67	56	0	0	0
Bajarka (202)	0	0	0	0	0	0
Barota(178)	75	42	33	0	0	0
Barwa(90)	54	26	28	0	0	0
Basai(86)	227	119	108	0	0	0
Biwan(98)	29	16	13	0	0	0
Chandanki(213)	21	11	10	0	0	0
Chandeni(158)	129	70	59	0	0	0
Chhachera (200)	138	74	64	0	0	0
Chhapera (167)	0	0	0	0	0	0
Chhapera(198)	404	210	194	0	0	0

Dhanduka (151)	252	138	114	0	0	0
Dhir Dhaunka(171)	0	0	0	0	0	0
Dubalu(194)	122	66	56	0	0	0
Gajarpur(166)	0	0	0	0	0	0
Gangauli(195)	750	395	355	0	0	0
Gehbar (114)	0	0	0	0	0	0
Ghasera(161)	329	184	145	0	0	0
Golpuri (143)	103	59	44	0	0	0
Hasanpur Nuh(16)	43	24	19	0	0	0
Hilalpur(183)	150	79	71	0	0	0
Hiranthla(164)	111	59	52	0	0	0
Hussainpur (149)	47	22	25	0	0	0
Indana(241)	144	79	65	0	0	0
Indri(197)	1030	550	480	0	0	0
Jogipur (105)	0	0	0	0	0	0
Kairaka (144)	3	1	2	0	0	0
Kanwarsika(175)	171	88	83	0	0	0
Khalilpur(193)	813	415	398	0	0	0
Khanpur Nuh(13)	0	0	0	0	0	0
Kherla (109)	273	144	129	0	0	0
Kherli Kankar(169)	86	39	47	0	0	0
Kherli Dausa(196)	378	195	183	0	0	0
Kherli Nuh(14)	106	57	49	0	0	0
Khor(84)	40	22	18	0	0	0
Khori Nuh (116)	0	0	0	0	0	0
Kira (199)	125	61	64	0	0	0
Kultajpur Kalan(62)	0	0	0	0	0	0
Kurali Sohna(89)	17	11	6	0	0	0
Kurthla (205)	239	135	104	0	0	0
Mahwan(88)	21	10	11	0	0	0
Mailawas(163)	0	0	0	0	0	0
Manaki (153)	0	0	0	0	0	0
Mandikhera(53)	729	407	322	0	0	0
Maraula(172)	8	4	4	0	0	0
Murad Bas (112)	109	56	53	0	0	0

Naushera (142)	37	21	16	0	0	0
Nizampur Nuh (107)	0	0	0	0	0	0
Qutabgarh(162)	162	85	77	0	0	0
Rahuka(182)	17	10	7	0	0	0
Raipuri (148)	12	7	5	0	0	0
Raisika(174)	5	3	2	0	0	0
Ranika(60)	45	22	23	0	0	0
Rethora(165)	97	47	50	0	0	0
Rewasan (168)	262	136	126	0	0	0
Rojka(173)	49	29	20	0	0	0
Rupaheri(170)	0	0	0	0	0	0
Sadain(94)	7	3	4	0	0	0
Salaheri (155)	0	0	0	0	0	0
Salamba (154) (CT)	390	205	185	0	0	0
Satputiaka (150)	0	0	0	0	0	0
Sonkh(100)	129	63	66	0	0	0
Sudaka (145)	145	72	73	0	0	0
Tain (152)	110	65	45	0	0	0
Tapkan(96)	39	21	18	0	0	0
Tarakpur (146)	0	0	0	0	0	0
Ujina (141)	828	437	391	0	0	0
Total	10618	5644	4974	0	0	0

Table 3.31. Worker's profile of Study area

Village Name	Total Workers	Male	Female	Main Worker	Marginal Worker	Non Worker
Adbar (106)	1676	1280	396	1232	444	4888
Akbarpur(128)	528	505	23	396	132	1701
Alduka (203)	1489	1011	478	1042	447	2298
Babupur Nuh (147)	327	205	122	272	55	853
Badhelaki(176)	73	71	2	72	1	481
Badka Alimudin(92)	506	470	36	167	339	2282
Badka Alimudin(92)	506	470	36	167	339	2282
Bainsi (204)	1276	886	390	751	525	2480
Bajarka (202)	276	264	12	274	2	969

Barota(178)	377	333	44	349	28	937
Barwa(90)	374	301	73	228	146	1169
Basai(86)	675	418	257	258	417	1489
Biwan(98)	229	188	41	127	102	728
Chandanki(213)	353	323	30	326	27	1435
Chandeni(158)	966	725	241	627	339	3256
Chhachera (200)	319	259	60	265	54	729
Chhapera (167)	379	247	132	249	130	772
Chhapera(198)	772	676	96	693	79	1805
Dhanduka (151)	319	217	102	132	187	663
Dhir Dhaunka(171)	103	97	6	99	4	513
Dubalu(194)	166	154	12	164	2	421
Gajarpur(166)	168	163	5	112	56	716
Gangauli(195)	760	568	192	493	267	1560
Gehbar (114)	109	106	3	108	1	341
Ghasera(161)	3277	2788	489	2343	934	11870
Golpuri (143)	855	667	188	717	138	2282
Hasanpur Nuh(16)	314	295	19	286	28	1068
Hilalpur(183)	227	151	76	114	113	425
Hiranthla(164)	245	236	9	226	19	1089
Hussainpur (149)	147	79	68	84	63	271
Indana(241)	846	693	153	688	158	2753
Indri(197)	1761	1435	326	1557	204	4836
Jogipur (105)	255	250	5	254	1	1051
Kairaka (144)	766	619	147	369	397	2254
Kanwarsika(175)	637	392	245	389	248	1336
Khalilpur(193)	1030	935	95	787	243	3260
Khanpur Nuh(13)	534	322	212	274	260	749
Kherla (109)	985	928	57	914	71	3671
Kherli Kankar(169)	365	314	51	324	41	1267
Kherli Dausa(196)	319	297	22	215	104	858
Kherli Nuh(14)	701	411	290	438	263	818
Khor(84)	188	168	20	158	30	772
Khori Nuh (116)	74	37	37	29	45	115
Kira (199)	335	198	137	277	58	422

Kultajpur Kalan(62)	160	116	44	96	64	371
Kurali Sohna(89)	264	259	5	176	88	1558
Kurthla (205)	887	560	327	797	90	1316
Mahwan(88)	154	147	7	70	84	639
Mailawas(163)	157	99	58	149	8	211
Manaki (153)	214	131	83	159	55	413
Mandikhera(53)	1118	732	386	490	628	1647
Maraula(172)	243	224	19	228	15	1100
Murad Bas (112)	563	415	148	379	184	1673
Naushera (142)	938	777	161	561	377	2816
Nizampur Nuh (107)	502	368	134	222	280	1512
Qutabgarh(162)	84	80	4	83	1	302
Rahuka(182)	383	233	150	148	235	788
Raipuri (148)	560	441	119	262	298	1703
Raisika(174)	79	73	6	79	0	261
Ranika(60)	302	279	23	153	149	1187
Rethora(165)	396	366	30	266	130	1695
Rewasan (168)	814	703	111	711	103	2729
Rojka(173)	924	823	101	854	70	3011
Rupaheri(170)	72	66	6	17	55	325
Sadain(94)	301	243	58	139	162	880
Salaheri (155)	1261	982	279	863	398	4206
Salamba (154) (CT)	1593	1220	373	671	922	4134
Satputiaka (150)	133	129	4	112	21	550
Sonkh(100)	453	362	91	318	135	1282
Sudaka (145)	2537	1658	879	1752	785	5610
Tain (152)	1022	914	108	583	439	3993
Tapkan(96)	1099	658	441	595	504	2112
Tarakpur (146)	240	114	126	188	52	421
Ujina (141)	1970	1779	191	1348	622	6427
Total	**46010**	**36103**	**9907**	**31515**	**14495**	**130807**

Occupational Pattern/ Economic Resource Base

Work has been defined as participation in any economically productive activity. Such participation may be physical or mental. Persons on leave and under training are also treated as workers. However, rent receivers and pensioners are not treated as workers.

Total Workers

Occupational pattern of any region mainly depends upon its economically active group i.e. the working populations involved in different economically productive activities. The total workers further categorized as main worker, marginal and the non-working population. The workers coming under the main and marginal workers category are cultivators, agricultural labours and those engaged in livestock, forestry, fishing, hunting, and plantations, orchards and allied activities, mining and quarrying, manufacturing, processing, servicing and repairs in household industry, construction trade and commerce, transport, storage and communication, and other services

Different types of workers in total worker population may be classified as –

Main Workers

Main workers are those who have worked for a major part of the year (i.e., at least six months or 183 days). Main activity of a person who was engaged in more than one activity was reckoned in terms of time disposition. 31515 i.e., 17.82 % of the total population comes under the main workers category from the 74 villages coming within study area. Main workers are further classified into 4 categories viz., cultivators, agricultural laborers and household workers and other main workers

Cultivators

For purposes of the Census a person is classified as cultivator if he or she is engaged in cultivation on land owned or held from government or held from private persons or for payment in money, kind or share. The person who is engaged either as employer, single worker or family worker in cultivation of land is recognized as a cultivator. The vegetable crops namely cucurbits, okra, carrot, radish cauliflower, chilli, brinjal, pea, leafy vegetables, tomato, onion (kharif and rabi) etc. are also grown in the district. Total 11291 i.e., 6.38% cultivar workers coming from 74 villages.

Agricultural Laborers

Persons working on land owned by others for wages or share in the yield have been treated as agricultural laborers. Out of the total main worker category agricultural laborers population in the 4229

i.e.2.39%.

Laborers in Household Industry

The laborers engaged in household activity are quite low in all the study area. Among the total main workers, only 595 population is recorded for household industry.

Other Workers

All main workers i.e. those who have been engaged in some economic activity during the last one year and who are neither cultivators nor agricultural laborers or household Industry workers are classified as other main workers. The type of workers that come under this category includes factory workers, plantation workers, those in trade, commerce, business,

transport, construction, political or social works, all government servants, municipal employees, teachers, priests, entertainers, artists etc. The other worker category includes 15400 (8.7%) population from main worker category in the region.

Marginal Workers

Marginal workers are those who have worked any time in the year for less than six months or 183 days but have not worked for a major part of the year. The population of marginal workers within the study area is 14495 of the total population.

Non-Workers

Non-Workers are those who have not worked any time at all in the year. Non-workers constitute householders, students, dependents, retired persons etc. The economy of the study area is primarily based on agriculture. The agriculture sector has thus absorbed a major portion of the working force. The categories of main workers, marginal workers and non-workers are complementary to each other. Therefore, in areas where the proportion of main workers and marginal workers are high, the proportion of non-workers would be naturally low. At present main workers category outweighs the marginal and non-workers in the study area.

The proportion of female main worker population is high as compared to their male worker counterpart because in general rural areas offer more opportunities for men and women to work in agriculture and animal husbandry etc. In view of the labor-intensive nature of agricultural economy, a large number of women are required to participate in work especially during the peak seasons of agricultural operations like sowing and harvesting which are to be carried out in a short span of time covering large areas in each village. It is being observed that the 1,30,807 i.e. 73.97% population are unemployed in villages coming within the study area.

Economic Resource Base

Agriculture and its allied activities are the major income sources of the people in the rural region of the study areas. Major crops are grown in both Kharif and Rabi seasons. Major crops grown in the region are wheat, mustard, red-chillies and potatoes. Mainly the agriculture is dependent on rainfall due to poor irrigation facilities; the productivity of land is mostly low in the study areas. However, local population is also engaged in the stone quarrying activity either as contractors or laborers. Project activities plays an important role in increasing the economic resource base for the people in the region.

Cultural and Aesthetic Attributes

As such no culturally and aesthetically important places except temple, mosque, etc. are located within the study areas.

Observation from Socio-economic Survey

In order to access and evaluate likely impacts arising out of any development projects on socio economic environment, it is necessary to gauge the apprehensions of the people in the study areas. Socio-economic survey was conducted in the villages within the study areas located in all directions with reference to the villages. The salient observations recorded during socio economic survey in the study areas are depicted below:

- Livelihood of the villagers is primarily based on agriculture sector. Majority of main workforce are engaged either in cultivation in own land and or in laboring activities in other agricultural land owners.
- Majority of workers are practicing farming activities without any irrigation source; it means that area under irrigation is very low using existing nalla, tube wells and some area is covered by unirrigated land.
- It has been observed that most of the villages have Primary School (PS) while in some villages it is extended up to Middle School (MS). While for further education villagers go to the town places.
- The main source of drinking water supply is through tap, dug well, bore well and hand pump. But majority of respondents expressed unsatisfactory opinion regarding the availability of drinking water facility i.e. Scarcity of drinking water is a major problem in the surveyed villages due to high TDS or odour in the tap water.
- Government constructed toilet facility under Swachh Bharat is available in many villages but it has been observed that villagers are not using them.
- It has been observed during survey that condition of roads is very poor in the core zone of study area and it is difficult for the residents to access in rainy season as the condition become even worse due to Kachcha road.
- Sanitation condition of the villages is also in poor condition.
- Some people in villages got vaccinated under Vaccine drive.
- Drinking water issues in villages like Chuniya, Kholhad, Pachgaon, Purniha, Kathautiya, Didwariya, Antari, Narbar, Bicharpur etc.
- The Government medical facilities in the form of primary health sub- centre and private medical representatives are available in the villages. Villagers expressed positive opinion regarding the facilities available at the centre. ANM (Auxiliary Nurse Midwife) frequently visits all the villages and regular vaccination and health checkup camps are organized by the health centre.
- Two wheelers, auto rickshaws and bus facility are the main mode of transportation used by natives in the study area.
- Power supply is available in mostly all the sampling villages. Street lights are also available in all villages but frequent power cut/ load shedding problem is experienced by the people in the area.
- Wood, kerosene and LPG gas is a major fuel used for cooking purpose.
- Availability of Post office and banking facilities in the surveyed villages.
- Majority of surveyed population opted positive response regarding the underground coal mine activities as most of the local population are expecting employment in the expecting coal mine area as contractors, drivers, or laborers and the activity will help in development of auxiliary as well as ancillary jobs in the region.

Covid19 Help Numbers

Global disaster corona virus Covid-19 related problems and related revenue officers can be contacted in mobile for law and order in District:

1. G H Mandikhera Hospital
2. Shaheed Hasan Khan Mewati Government Medical College Nalhar Hospital

S.No.	Name of Facility	Number
1.	COVID Helpline	1950
2.	Women Helpline	1091
3.	Police Control Room	100
4.	Child Helpline	1098
5.	Aadhar Helpline	1947
6.	Ambulance	102
7.	Kisan Call Centre	1551

Important Phone numbers:

Name	Designation	Landline No
Sh. Ajay Kumar, IAS	Deputy Commissioner Nuh	01267-274602
Sh. Varun Singla, IPS	SP, Nuh	01267-274616
Dr. Subhita Dhaka, HCS	ADC, Nuh	01267-274606
Shri Ranbir Singh, HCS	CTM, Nuh	01267-274610
Shri. Ashwani Kumar, HCS	SDM Nuh	01267-271201
Sh. Sunder Pal, HCS	SDM Tauru	01267-281001
Shri Ranbir Singh, HCS	SDM Firozepur Jhirka	01268-277222
Mrs. Manisha, HCS	SDM Punhana	01268-272222
Sh. Suresh Kumar	District Revenue Officer	01267-274611
Sh Jitesh Kumar, HPS	Secretary RTA	01267-274605

3.14 SUMMARY

Table 3-33: Summary of Baseline Status of Study Area

S. No.	Parameters	Baseline Status (µg/m³)
1.	**Ambient Air Quality**	
i.	PM_{10}	79.42-94.13
ii.	$PM_{2.5}$	39.66-53.96
iii.	SO_2	11.89-14.52
iv.	NO_2	21.04-24.73
v.	CO	0.57-0.81

S. No.	Parameters	Baseline Status (µg/m³)
All results have been found within the NAAQ Standard Limit		
2.	**Noise Level Monitoring**	**(dB(A))**
i.	Day Time (06:00 AM to 10:00 PM)	46.1-57.4 dB(A)
ii.	Night Time (10:00 PM to06:00 AM)	35.4-48.1 dB(A)
The observed noise levels are meeting the acceptable norms		
3.	**Soil Quality and Characteristics**	**(mg/kg)**
i.	pH	7.11-7.51
ii.	Organic Matter (%)	0.61-1.56
iii.	Total Nitrogen (%)	0.063-0.09
iv.	Total Phosphorous	51.65-77.86
v.	Available Calcium	3205.41-4549.55
vi.	Available Magnesium	389.18-577.45
4.	**Ground Water**	**(mg/l)**
i.	pH	7.98-8.31
ii.	TDS	1411-1786
iii.	Total Hardness	403-760
iv.	Total Alkalinity	213-512
Water quality of study region is potable because results of parameters do meet with the drinking water standard as per IS 10500:2012.		
5.	**Surface Water**	**(mg/L)**
i.	pH	7.36-8.16
ii.	TDS	251-435
iii.	DO	7.4
iv.	BOD	8- 10.30
Ecology: The most commonly spotted bird species of this area is Pigeon, Sparrow, Parrot etc. All the birds are included in schedule IV. Among the reptiles' home lizard was common. Among mammals' cow, rat is common. There is a good population of schedule-II species. Dominant flora of the study region is *Neem, Amaltas, carrot grass* is common. Natural vegetation of study area is in good condition and wild mammal 's density is also very low. No endangered or threatened species were observed during the survey.		
Socio Economy: Most of the population are depended upon farming. Drinking Water facility and sanitization is very poor in this area.		

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1. GENERAL

The chapter aims at controlling pollution at the source level to the extent possible with the available and affordable technology followed by treatment measures before they are discharged. The proposed project would create impact on the environment in two distinct phases:

During the construction phase which may be regarded as temporary or short term;

During the operation phase which would have long term effects.

The construction and operational phase of the proposed project comprises various activities each of which will have an impact on some or other environmental parameters. Various impacts during the construction and operation phase on the environmental parameters have been studied and mitigation measures for the same are discussed briefly below and elaborated in the subsequent sections.

4.2 ANTICIPATED ENVIRONMENTAL IMPACTS DURING CONSTRUCTION PHASE

This phase involves the activities like erection of civil units, new equipment and machinery, green belt development *etc.* Different components of environment are likely to be affected by the activities. But the impacts will be marginal and for short term only. The green belt development will have positive impacts.

4.2.1. Matrix Representation

Table 4-1: Impact Identification Matrix (Construction Phase)

Activities	Environmental Attributes										
	Air	Water	Soil	Noise	LU/LC	Hydro	Geology	SHW	Risk & Occupational	Ecology and	Socio
Transportation and Movement/ Operation of materials & machinery	✓	-	✓	✓	-	-	-	-	✓	✓	✓
Storage and Handling of Construction Material	✓	✓	✓	✓	-	-	-	-	✓	-	-
Civil Construction Activity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Activities	Environmental Attributes										
	Air	Water	Soil	Noise	LU/LC	Hydro	Geology	SHW	Risk & Occupational	Ecology and	Socio
Disposal of Construction Debris	✓	-	✓	✓	✓	-	-	✓	-	-	-
Waste water /Sewage Disposal	-	-	✓	-	-	-	-	-	-	-	✓
Employment	-	✓	-	-	-	-	-	✓	-	-	✓
Greenbelt Development	✓	✓	✓	✓	✓	✓	✓	-	-	✓	✓

Table 4-2: Severity Criteria for Magnitude of Impacts

S. No	Category	Description of category	Impact	
			Adverse	Beneficial
1.	No impact	-	0	0
2.	No appreciable impact	Short term reversible	-1	1
3.	Significant impact	Long term reversible	-2	2
4.	Major impact	Irreversible but of lesser extent	-3	3
5.	High impact	Irreversible but of medium extent	-4	4
6.	Permanent impact	Severe irreversible impact	-5	5

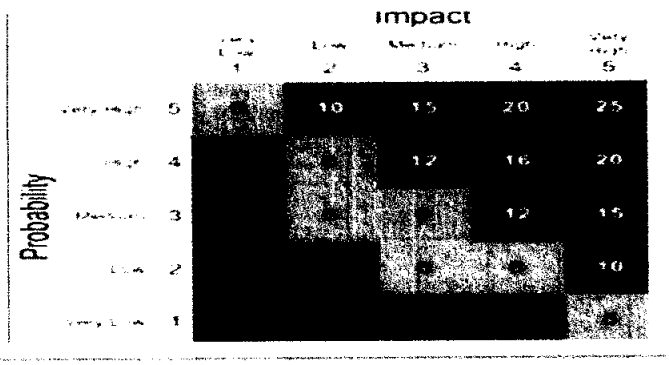


Table4-3:Score Range for Beneficial and Adverse Impacts

S. No	Total score	Outcome
1.	+ve / -ve	Beneficial impact / adverse impact
2.	0-150	No appreciable Beneficial impact / adverse impact
3.	151-300	Appreciable but reversible adverse impact-mitigation measures are needed
4.	301-450	Significant adverse impacts: most of the impacts are reversible. Mitigation measures are crucial.
5.	451-600	Major adverse impacts; most of the impacts are reversible. Alternative site selection to be considered.
6.	>600	Permanent irreversible impact; alternatives to the project need to be explored

Table 4-4: Environmental Impact Matrix without Mitigation Measures (Construction Phase)

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro	Geology	SHW	Risk & Occupational	Ecology and Biodiversity	Socio	Total
Transportation and Movement/ Operation of materials & machinery	-6	-	-4	-6	-	-	-	-	-6	-6	-6	**-34**
Storage and Handling of Construction Material	-6	-4	-6	-6	-	-	-	-	-6	-	-	**-28**
Civil Construction Activity	-12	-9	-6	-6	-6	-6	-6	-6	-6	-6	-6	**-75**
Disposal of Construction Debris	-6	-9	-9	-4	-4	-	-	-6	-	-	-	**-38**
Waste water /Sewage Disposal	-	-	-4	-	-	-	-	-	-	-	-4	**-8**
Employment	-	-9	-	-	-	-	-	-6	-	-	9	**-24**
Greenbelt Development	15	-6	9	6	6	-6	-6	-	-	15	9	**42**
Total Score	**-15**	**-37**	**-20**	**-16**	**-4**	**-12**	**-12**	**-18**	**-18**	**3**	**2**	**-165**

4.2.2 Air Environment

Table 4-5: Impact and Mitigation Measures on Air Environment (Construction Phase)

Project Activity	Impact	Mitigation Measures
Transportation and movement/operation of machineries	• Fugitive Dust Emissions due tovehicle Movement Exhaust emissions from vehicles and equipment deployed during the construction phase is also likely to result in marginal increase in the levels of SO_2, NOx and PM which leads to respiratory ailments like asthma and other dust related	• Regular water sprinkling will be done to avoid dust generation from transportation. • Trucks used for transportation of construction materials shall be covered with tarpaulin sheet toavoid dust dispersion at site. • Only PUC vehicle will be used

	problems to the human health.	for the transportation of materials and equipment. • Construction site will be barricaded with sheet to avoid dust emission due to wind from project site.
Civil Construction Activities	• Increase of dust and airborneparticulates. • Dust generation during materialhandling. Air emission during construction activities.	• Regular water sprinkling will be doneto control dust emission. • Personnel Protective Equipment (PPEs) will be provided to the construction workers. Hence there will be no significant impacts on their health due to the dust particle. • Barrier will be provided around the project site
Disposal of Construction Debrisand domesticgarbage.	Construction debris and disposed domestic garbage will create nuisance due to odour generation.	• Separate bins will be provided storing Garbage/wastes and will be disposed-off adequately. • Excavated soil and construction debris will be sprinkled with water and kept moist.
Wastewater-sewage disposal	Odour generation due to sewage disposal	Sanitation facilities shall be provided to construction workers.
GreenbeltDevelopment	• Positive impact due to greenbeltdevelopment as it will act natural barrier for dust and noise emission.	Greenbelt of 33% will be developed.

4.2.3 Water Environment

Table 4-6: Impact and Mitigation Measures on Water Environment (Construction Phase)

Project Activity	Impact	Mitigation Measures
Civil Construction Activity	Decrease the ground water level due to consumption of water	• The water will be sourced through ground water but only 2 KLD water is required. Hence no major impact envisaged.
Storage and Handling of Construction material	Run-off from Storage Areas of Construction Material	• Construction activities will be stopped during rainy months. • Proper storm water drainage system is available.

Wastewater/ Sewage Disposal	Untreated sewage from construction area may have negative impact.	Proper Sanitation facilities will be revised to construction workers.

4.2.4 Soil Environment

Table 4-7: Impact and Mitigation Measures on Soil Environment (Construction Phase)

Project Activity	Impact	Mitigation Measures
Transportation and movement/operation ofmachineries	• Compaction of soil due tovehicular movement. • Soil degradation due to spillage/leakage of oil and grease from vehicles, machineries and DG Set.	• Construction of RCC roads and pavements of working area for prevention of oil & grease getting mixed with soil. • No major impact on soil as unit is located on industrial land.
Civil construction activities	The excavated earth material ifstacked loosely may result into runoff resulting in loss of topsoil.	• Excavated earth shall be stored in stockpiles and covered with plastic/tarpaulin sheets or stored inclosed room and reused for landscape development along thecorridor. • Construction activities will be stopped during rainy months. • A well-designed storm water drainage network and sewerage network will be provided for the proposed project for carry away of rainwater runoff. • Existing premise is not agricultural land hence no impact on fertility of soil.
Storage and handling of construction material	• Soil contamination due to handling and storage of construction material. Oil spillage can affect physical and chemical properties of the soils.	• The construction material & diesel /oil to be used for various construction activities shall be stored in designated storage yards to reduce the spills into unwarranted areas. • Good practices of storage and material handling will be carried out. • Spillage control will be carried out by disposing the affected soil at adequate place
Transportation andDisposal of Construction Debris	Contamination of the soils of surrounding area due to construction materials such as cement, sand, oils, etc.	• The construction wastes shall be utilized for PCC works, road construction and other fillingrequirement etc. • Construction waste will be categorized in to recyclable and non- recyclable and stored separately. Recyclable construction waste will besent for recycling and non-recyclable waste will be sent to authorize dealers for disposal.
Wastewater-sewage Disposal	Contamination of soil due to discharge of waste water	• No wastewater from construction site will be allowed to disposed-off on land. • Adequate sanitation facilities for labours will be provided. RCC construction septic tank walls followedby soak pit system along with adequate liner system will be provided.

		• Regular monitoring/ checking/ inspection of the sewage networksystem
Green belt Development	Positive impact as improvement in soil texture due to binding of top soil materials and root structure.	• The greenbelt development will control the soil erosion due to windand runoff water, Regularmaintenance of greenbelt will be done. • Maximum portion of the plot area will be built up and paved to minimize the soil erosion/dust carryover due to wind.

4.2.5 Noise Environment

Table 4-8: Impact and Mitigation Measures on Noise Environment (Construction Phase)

Project Activity	Impact	Mitigation Measures
Transportation and movement/operation ofmachineries **Civil Construction Activities** **Storage and handling of construction material**	• Continuous Noise pollution affects the human working efficiency. Chances of hearing loss due to continue noise emission.	• Only PUC vehicle will be used for the transportation of materials and equipment. • Construction activities shall be allowed only during day time. • Machinery used for construction will be of high standard reputedmake and will adhere to international standards. These standards itself take care of noise pollution control / vibration control and air emission control. • Use of well-maintained construction equipment as well as vehicles used for transportation. • Vibration control damped tools shall be used and the number of hours that a worker uses them must be limited. • D. G. Set shall be provided with acoustic enclosures and shall be used only in case of power failure/emergency. • Provision of PPEs likeearmuffs/earplug to avoid adverse effects of noise on occupational health and hearing capacity of workers as well as planning of working hours and shift of workers.
Green belt Development	Reduction in noise waves to receptors serving as a noise barrier.	• 33% area will be developed as greenbelt on periphery ofplant premises.

4.2.6 Land Use/Land Cover

Table 4-9: Impact and Mitigation Measures on Land Use/Land Cover Environment (Construction Phase)

Project Activity	Impact	Mitigation Measures
Civil Construction Activities	Land cover of area will be changed into factory building which will be converted in toindustrial purpose. No major impact on LU/LC.	• Changes inevitable, however – Specific measures like suitable planning and execution of activities – Keep landscape an integral part of design Drainage network will be designed keeping in mind the natural drainage pattern.
Green belt Development	Conservation of land resource due to greenbelt development at 33% of total plot area which is positive impact Additional natural green scenic beauty and aesthetic conditions will be created.	• Wire fencing will be provided to each plant. Regular maintenance and watering of greenbelt will be done.

4.2.7 Hydrogeology

Table 4-10: Impact and Mitigation Measures on Hydrogeology Environment (Construction Phase)

Project Activity	Impact	Mitigation Measures
Green Belt Development	Loss of ground waterresources.	• Ground water level is much below in the project site, as there will be no loss in hydrogeology due to plantation. • Due care will be taken in selection of tree.

4.2.8 Geology

Table 4.11. Impact And Mitigation Measures of Geology Environment (Construction Phase)

Project Activity	Aspect and Probable Impact	Mitigation Measures
Civil Construction activity	• Misuse/ mismanagement of excavated earth and solid rocks if any will lead to loss of soil and rocks as a resource.	• Excavated earth will be reused within the plot premises for land leveling and greenbeltdevelopment. • Solid rocks will be reused within the plot premises for the construction of the units and walls.
Green Belt Development	• Geological Structure • Building structure	• Due care will be taken in selectionof tree. • Selection of trees as per guidelines prescribed by CPCB.

4.2.9 Solid/Hazardous Wastes

Table 4-12: Impact and Mitigation Measures on Solid/Hazardous Environment (Construction Phase)

Project Activity	Impact	Mitigation Measures
Civil Construction Activities	• The excavated earth material if stacked loosely may result into runoff during rainy season resulting in loss of top soil.	• Excavated earth shall be stored in stockpiles and covered with plastic/tarpaulin sheets or stored in closed room and reused for landscape development along the corridor.
Transportation and Disposal of Construction Debris	• Due to construction activity construction waste will be generated may cause negativeimpact, if not disposed properly. • Fuel leakage/ spillage used for construction equipment or vehicles may cause land contamination.	• Fuel leakage/spillage shall be mitigated by providing properly lined storage area. • The construction wastes shall be utilized for leveling work etc. • Care shall also be taken those stagnant pools are not formed at the site during the construction phase.

Wastewater-sewage Disposal	• The solid wastes generated from the domestic activities of construction workforce may cause land contamination.	• Proper sanitation and drinking water facilities shall be provided for construction workers. • Sewage generated will be disposed properly through existing soak pit to avoid any adverse impacts on land.
Green Belt Development	• Plant shed out materials like leaves, roots, branches etc.) from the environment for growth and other processes.	• Daily collection of waste will be carried out and composting of this waste will used as manure for greenbelt and vegetable farms development.

4.2.10 Risk & Occupational Hazards

Table 4-13: Impact and Mitigation Measures on Risk and Occupational Hazards (Construction Phase)

Project Activity	Impact	Mitigation Measures
Transportation and movement/operation ofmachineries **Civil Construction Activities** **Storage and handling of construction material**	• Chances of accident during transportation of material. • Falling into the pit will cause personal injury. • Earth collapse will lead to Suffocation /breathlessness or completely buried. Fall from height, cut injury and fall injury due to construction activities.	• All transportation within the main working will be carried out directly under the supervision and control of the management. • The vehicles must be maintained in good repairs and checkedthoroughly at least once a week by the competent person authorized for the purpose by the Management. • Will provide guard rails /barricade with warning signal for excavated pit. • Will provide escape ladders in case of emergency • Will not allow vehicles to operate too close to excavated areas. • Safe construction practices will be followed under supervisor's direction. • Workers will be provided with adequate PPEs to safeguard them against potential risks also use of PPE's will be ensured.

4.2.11 Ecology and Biodiversity

Table 4-14: Impact and Mitigation Measures on Ecology and Biodiversity (Construction Phase)

Project Activity	Impact	Mitigation Measures
Transportation and movement/operation ofmachineries	• During the site visit, it was observed that there is no forest land, or ecologically sensitive area near the project site. Hence impact on the same is not envisaged. • Noise from construction works, construction machineries andequipment will have mediumimpact on ecology. • The habitual activities of the avifauna species will be affected during transportation of material.	• Noise will be minimized by making boundary of construction area. • Transportation of products and raw material should be minimizing in the morning and evening. Regular watering and maintenance of the greenbelt for sustained plant growth.
Greenbelt Development	• Greenbelt development may cause positive impacts on theflora by enhancement of green spaces.	• Efficient management of greenbelt and their conservation. • Regular watering and maintenance of the greenbelt for

4.2.12 Socio-Economy

Table 4-15: Impact and Mitigation Measures on Socio-Economic Conditions (Construction Phase)

Project Activity	Impact	Mitigation Measures
Transportation and movement/operation ofmachineries	• The construction phase will generate employment opportunity of in the skilled as well as unskilled categories. Although the workforce requirement will be temporary in nature, it will be met from the local populace hence there will be positive impact. Construction workers will require essential basic infrastructure facilities *viz.* safe drinking water, adequate sanitation, etc. will have temporary impact on the existing facilities.	• Local agencies will be appointed for the transportation of materialsand machinery.
Civil Construction Activities		• Preference will be given to local labour in terms of providing employment for constructionphase.
Recruitment		• No improper disposal of wastes will be allowed. • Construction wastes will be disposed-off adequately. • Wastes will be handled/ disposed according to the Waste Management Rules, 2016.
Green belt Development		• Preference will give to local gardeners in terms of providing employment for construction phase.

Table 4-16: Environmental Impact Matrix with Mitigation Measures (Construction Phase)

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Occupational	Ecology	Socio Economic	Total
Transportation and Movement/ Operation of	-2	-	-	-2	-	-	-	-	-2	-	-	**-6**

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Occupational	Ecology	Socio Economic	Total
materials & machinery												
Storage and Handling of Construction Material	-2	-	-	-2	-	-	-	-	-2	-	-	**-6**
Civil Construction Activity	-2	-6	-2	-4	-2	-	-	-4	-4	-	-	**-24**
Disposal of Construction Debris	-4	-	-	-	-	-	-	-2	-	-	-	**-6**
Waste water /Sewage Disposal	-	-	-	-	-	-	-	-	-	-	-	**-**
Employment	-	-9	-	-	-	-	-	-2	-	-	9	**-2**
Greenbelt Development	15	-	9	6	6	-	-	-	-	15	9	**60**
Total Score	**5**	**-15**	**7**	**-2**	**4**	**-**	**-**	**-8**	**-8**	**15**	**18**	**16**

After taking mitigation measures as suggested, the score of impact in civil construction work represent reduced to -24 which were -75 due to civil work without mitigation. Total cumulative score of impact on environment after taking mitigation measures is +16 during construction phase which represent appreciable beneficial impact.

4.3 ANTICIPATED ENVIRONMENTAL IMPACTS DURING OPERATION PHASE

Operation phase is important because it generates long-term impacts as the project implementation phase starts. The primary impacts causing likely deterioration will be in Air, Water, Noise and Land/Soil due to the specialty chemicals plant operations, maintenance, gaseous emissions, sewage/ effluent discharge and vehicular movement.

4.3.1 Matrix Representation

Table 4-17: Impact Identification Matrix (Operation Phase)

Activities	Environmental Attributes										
	Air	Water	Soil	Noise	LU/LC	Hydro	Geology	SHW	Risk & Occupational	Ecology & Biodiversity	SE
Transportation of RM & Finished Goods	✓	-	-	✓	-	-	-	-	✓	✓	✓
Raw material storage and processing and finished products storage	✓	-	-	✓	-	-	-	✓	✓	-	✓
Distillation	✓	✓		✓				✓	✓		✓
Liquid Waste	-	✓	✓	✓	-	-	-	✓	✓	-	✓
Solid/ Hazardous Waste Disposal	-	-	✓	-	-	-	-	✓	✓	✓	✓
Green Belt Development	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Recruitment	-	✓	-	-	-	-	-	✓	-	-	✓

Table 4-18: Environmental Impact Matrix without Mitigation Measures (Operation Phase)

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Occupational	Ecology and	Socio	Total
Transportation of RM & Finished Goods	-20	-	-	-12	-	-	-	-	-15	-12	-12	**-71**
Raw material storage and processing and finished products storage	-20	-	-	-12	-	-	-	-15	-20	-	-12	**-79**
Distillation	-25	-12	-	-12				-12	-12		-12	**-85**
Liquid Waste	-	-12	-12	-12	-	-	-	-6	-6	-	-9	**-57**
Solid/ Hazardous Waste Disposal	-	-	-12	-	-	-	-	-12	-12	-12	-12	**-60**
Green Belt Development	25	-12	12	12	12	-6	-6	12	-	25	12	**98**
Recruitment	-	-6	-	-	-	-	-	-9	-	-	15	**0**
Cumulative Score	**-40**	**-42**	**-12**	**-36**	**12**	**-6**	**-6**	**-36**	**-65**	**1**	**-30**	**-254**

The highest scoring of impact occurred during Distillation. On Air, maximum impact (-40) envisaged during operation phase. The cumulative score without mitigation measures is -254 which represent major adverse impact; hence it is suggested to take crucial mitigation measures.

4.3.2 Air Modeling Study

Air Emissions Source for Construction Phase

The potential sources of air emission during the construction phase of the project are as follows:

- Dust from earth works (during site clearance and preparation for site);
- Emissions from DG set.
- Emissions from the operation of construction equipment and Diesel operated machineries at site;
- Fugitive emissions from vehicles running to site;
- Fugitive emissions during the unloading of road construction material;
- Fugitive emissions during mixing of building materials during construction activities;
- Air emissions other than dust arise from combustion of hydrocarbons. The pollutants of concerns are NO_2, SO_2, CO, particulate etc.

Prediction of Impacts for Construction Phase

Vehicular emissions and DG set emissions are the major sources of air pollution. During the post construction phase, vehicles running on road such as trucks, cars, scooter/motorcycle etc. owned by the population will be major source of emission. Ground Level Concentration of pollutants (as added by the project) is depend upon the following:

- Emission of pollutants from additional traffic on the roads due to the project.
- Meteorological conditions.
- Emission sources from D.G. Sets.
- Fugitive emissions.

SPM, NO_2, CO, SO_2 will be the main pollutants of primary concern released from traffic movement and DG sets emissions. The dispersion of vehicular emissions would be confined within limited distance from the road and concentration will decrease with the increase in distance from road as worked out by the line source model. It was anticipated that the contribution of vehicular emissions from the exhaust in ambient air quality will be marginal as Pollution Under Control (PUC) Certified vehicles and branded vehicles with low sulphur diesel will be used. Ground Level Concentration (GLC) of pollutants are found to be well within the stipulated National Ambient Air Quality Standards due to traffic movement and vehicles used inside the premises. Air modeling for DG set using AERMOD model has been done for prediction of impacts caused by DG sets operation. The emission data was used as per design value provided by standard make and stipulated standards. Other primary data used as input for model were hourly meteorological data of Wind speed & direction, temperature, cloud amount and mixing height.

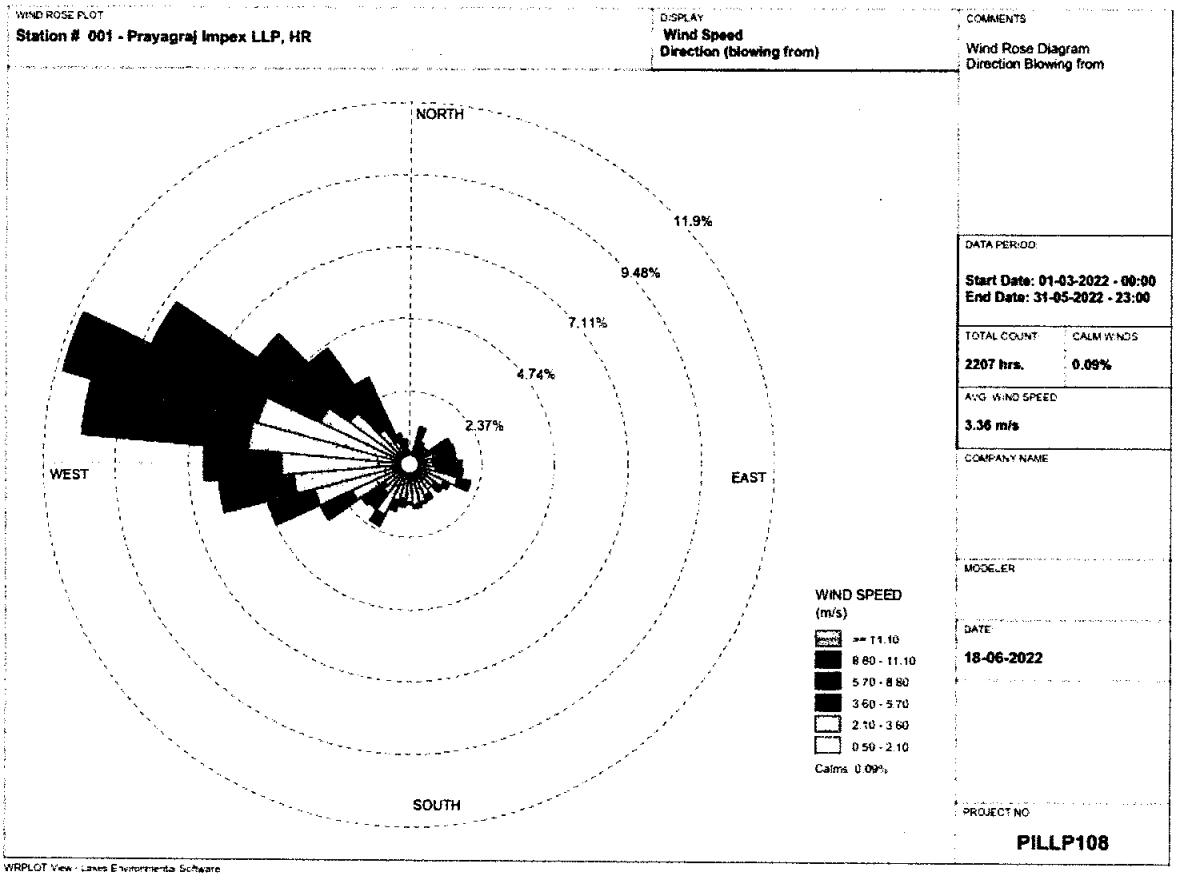
The power supply is being supplied by Haryana Electricity Board. D.G. set is used only during power failure and low sulphur diesel are being used as fuel to minimize SO_2 emission. Incremental load in the ambient air environment is found to be very low as given here. An adequate stack height for D.G. sets at material crushing site is provided as per the stipulated

guidelines of Central Pollution Control Board (CPCB) to facilitate adequate dispersion of pollutants and to minimize the impact on Ambient Air Quality under the influence of local meteorology.

Table 4-19. CPCB Emission Factor

Year	Passenger Cars		LCVs	HCVs
	Petrol	Diesel		
A. Emission Factor (gm/km) of CO				
BS-I	3.01	0.72	3.66	6
BS-II	3.01	0.3	3.66	6
BS-III	1.945	0.06	3.66	6
BS-IV	1.294	0.047	2.65	4.345
B. Emission Factor (gm/km) of PM_{10}				
BS-I	0.006	0.19	0.475	1.24
BS-II	0.006	0.06	0.475	1.24
BS-III	0.002	0.015	0.475	0.42
BS-IV	0.002	0.008	0.081	0.071
C. Emission Factor (gm/km) of NO_2				
BS-I	0.21	0.84	2.12	9.3
BS-II	0.21	0.49	2.12	9.3
BS-III	0.09	0.28	2.12	8.63
BS-IV	0.048	0.14	1.484	6.041

Meteorology –Hourly Meteorological data of wind speed & direction, temperature, cloud amount and rainfall were monitored at site for the dispersion model. Wind rose was prepared in sixteen directions as per standards. It was observed that wind direction from NW during the study period. Average wind speed was 3.36 m/s during study period and calm condition was 0.09%.



Predicted GLC in Operation Phase (Air Modeling)

The predictions for air quality during operation phase was carried out using CPCB/MoEFCC approved USEPA, AERMOD Dispersion model developed by the US Environmental Protection Agency (USEPA) for prediction of pollutants dispersion from single or multiple point sources using emission and hourly meteorological data of the study period. Assumption used in the model was as follows:

The plume rise is limited to that of the mixing layer as published by IMD in the Catalogue of Atlas of Mixing Heights in India for the site.

- Stack down wash is not considered.
- Flat terrain is used for computations;
- It is assumed that the pollutants do not undergo any physico-chemical transformation.
- Chemical and scavenging process occurred in the atmosphere in the pollutants released at the stack exit is not considered.
- Prediction is based on single/multiple point sources, pollution released at stack exit and dispersed on the ground under influence of local meteorological conditions during the season.

AERMOD dispersion model was used to predict GLC caused by a point source at each receptor of 100 m x 100 m of grid network covering total area of 10000 m x 10000 m around the proposed source with stack & emission values and 1-hourly meteorological data. It was

observed that SO_2, NO_2 CO and PM (PM10 & PM2.5) were significant pollutants released during operation phase. Emission of PM and SO_2 were found insignificant with low values compared to NO_2.

Table 4-20: Stack & Emission Details for Air Modelling

Stack No.	Stack attached to	Capacity	Stack & Flue details				Pollutants Emission			
			Height (m)	velocity (m/s)	Temp (K)	Dia (m)	NO_2 (g/s)	SO_2 (g/s)	PM (g/s)	CO (g/s
1.	DG Set	500 KVA	11	22	498	0.271	0.913	0.392	0.135	0.041
2.	TFH	2	30	25	635	0.43	0.0112	0.584	0.004	0.015
Total Emission (g/s)							0.9242	0.976	0.139	0.056

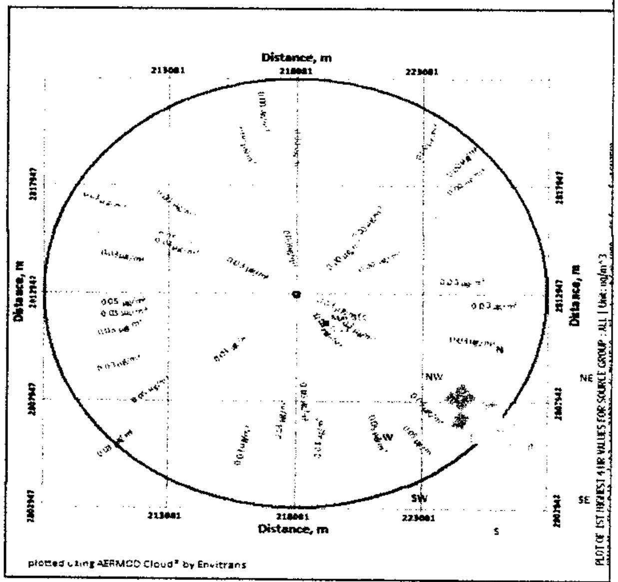
Table 4-21: Total incremental load at Project site

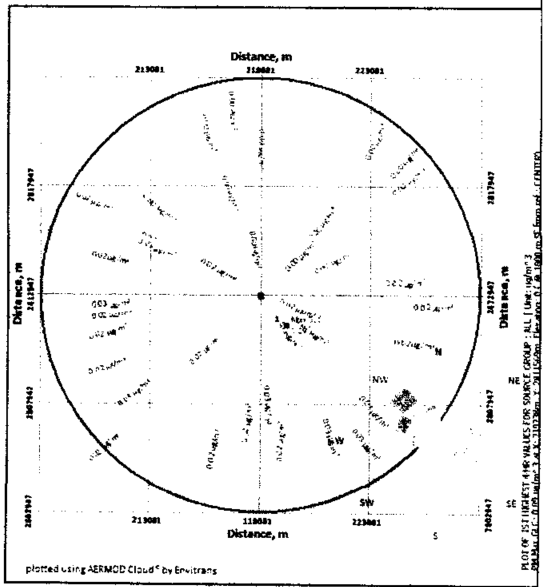
Description	Permissible value ($\mu g/m^3$)	Background 98%ile value ($\mu g/m^3$)	Max Incremental GLC ($\mu g/m^3$) due to Project Operation	Distance (m) in downwind direction from Project site
PM10	100	83.32	0.13	765
PM2.5	60	41.95	0.09	550
NO_2	80	22.94	0.56	550
SO_2	80	12.81	3.51	650
CO	4000	0.72	0.13	500

Table 4-22. Ground Level Concentration of Pollutants ($\mu g/m^3$)

Location	Baseline Concentrations (98%ile)					Predicted GLC ($\mu g/m^3$)– AERMOD					Cumulative GLC ($\mu g/m^3$)				
	PM10	PM2.5	NOx	SOx	CO	PM10	PM2.5	NOx	SO2	CO	PM10	PM2.5	NOx	SOx	CO
AQ1	83.32	41.95	22.94	12.81	0.72	0.015	0.011	0.063	0.057	0.003	83.335	41.961	23.003	12.867	0.723
AQ2	81.61	42.19	23.39	11.79	0.63	0.028	0.293	0.129	0.102	0.04	81.638	42.483	23.519	11.892	0.67
AQ3	95.07	56.37	27.30	15.61	0.85	0.092	0.204	0.146	0.350	0.02	95.162	56.574	27.446	15.96	0.87
AQ4	83.62	42.16	23.64	12.54	0.62	0.091	0.155	0.128	0.280	0.06	83.711	42.315	23.768	12.82	0.68
AQ5	96.52	56.67	26.93	15.48	0.87	0.129	0.758	0.351	1.98	0.09	96.649	57.428	27.281	17.46	0.96
AQ6	96.35	56.83	26.36	14.83	0.84	0.045	0.211	0.022	0.11	0.05	96.395	57.041	26.382	14.94	0.89
AQ7	94.14	53.62	26.50	16.12	0.84	0.031	0.284	0.042	0.29	0.02	94.171	53.904	26.542	16.41	0.86

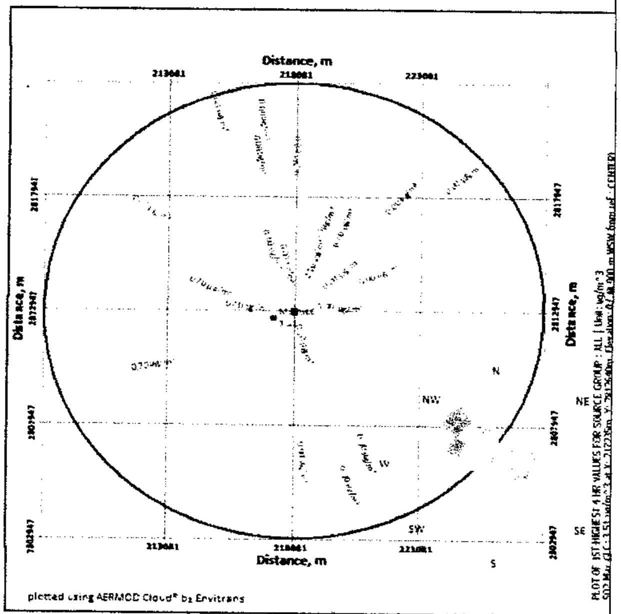
AQ8	82.90	43.14	23.65	12.92	0.61	0.044	0.221	0.055	0.45	0.02	82.944	43.361	23.705	13.37	0.63

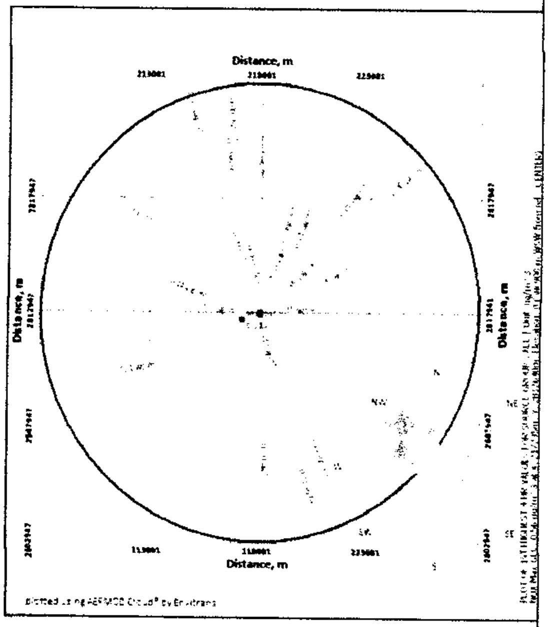




PM10

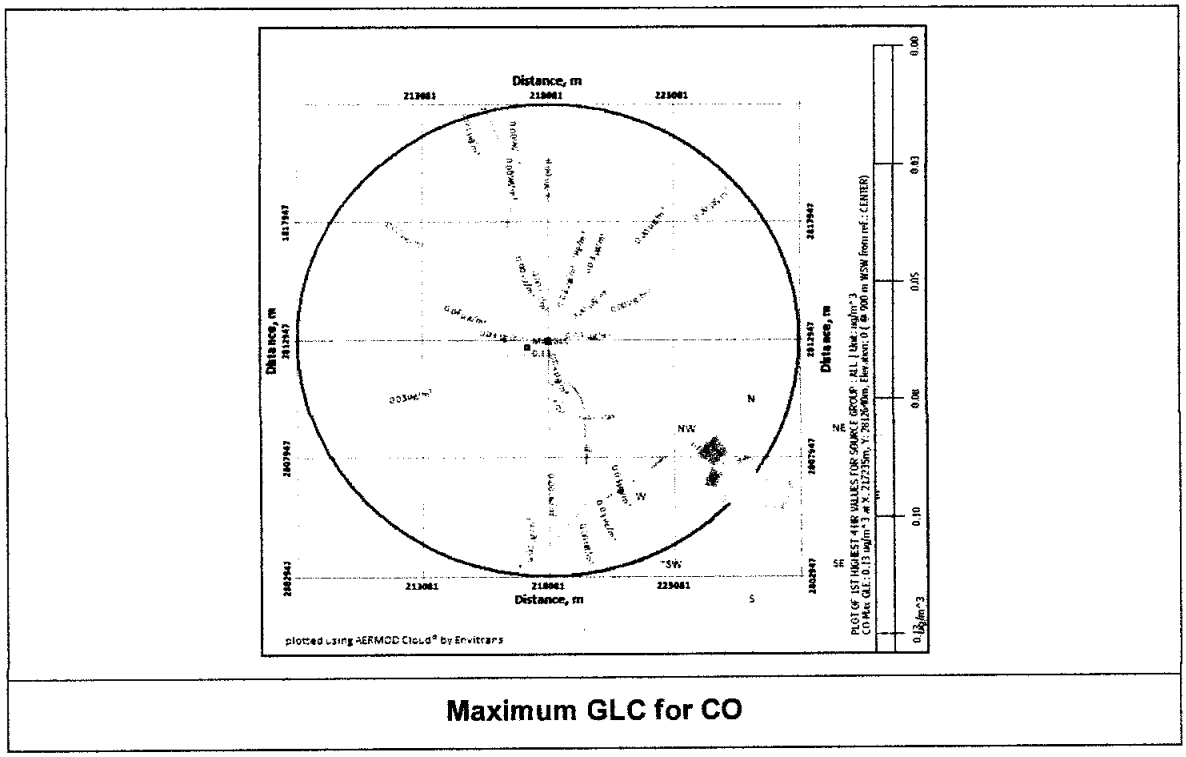
Maximum GLC for $PM_{2.5}$





Maximum GLC for SO_2

Maximum GLC for NO2



Maximum GLC for CO

Fig. 4.1 Isopleths of Particulate Matter (PM), NO_2, SO_2, & CO around the Project

AERMOD - Dispersion model was used to predict GLC of all pollutants; SO_2, CO, NO_2 and PM with stack & emission and hourly meteorological data. Spatial distribution of PM, SOx, NO_2 and CO is shown in isopleth above.

Stack emissions

- Online stack monitoring system will be provided to keep a check on emissions and implement proper measures in case of any failure or violation of prescribed standards.
- Regular cleaning, inspection and maintenance of air pollution control equipment will be carried out.
- Ensuring preventive maintenance of equipment.
- Workers will be trained regarding emergency actions to be taken during equipment failure.
- The whole distillery unit will be provided with facility of inter locking so that any failure of equipment or APCD will result in instant shut down of the complete process.

DG sets will be used only for emergency purpose and in case of power failure

Action Plan for Control and Monitoring of Fugitive Emissions

The fugitive dust (PM) emissions shall occur from road, raw material unloading and loading, vehicle movement leading the re-suspension of settled dust, etc. Following mitigation measures are recommended for its control:

- Apply water to suppress dust generation
- Stabilized concreted earthworks with stone, soil, geotextiles, vegetation, compacting.
- Use enclosures – covering for stockpiles – tarpaulin, plastic, fences, screens
- Keep proper shape of stockpiles (avoid steep slopes and faces)
- Remove muck from truck tyres and under bodies prior to leaving the plant premises
- Minimize the drop height of raw materials
- All road surfaces for permanent movement of trucks shall be paved (Concreted)
- Use mechanical road sweeping machine for regular cleaning of roads
- Use industrial vacuum cleaner for cleaning all shop floors and roofs.

4.3.3 Air Environment

Table 4-23: Impact and Mitigation Measures on Air Environment (Operation Phase)

Project Activity	Impact	Mitigation Measures
Vehicle Movement and utilities operation	• Release of flue gas emission like PM, SO_2 and NO_x from diesel operated vehicles. • Release of flue gas emission like PM, SO_2 and NO_x from Thermic Fluid Heater. • Release of flue gas emission like PM, SO_2 and NO_x from diesel operated D.G. Sets. Generation of fugitive dust due to vehicle movement for transportation of raw material and finished goods	• Vehicles with valid PUC will be used for the transportation of materials and equipment. • Proposed cyclone separator, bag filter will be provided. • FO will be used as fuel to operate Thermic Fluid heater. • Adequate stack height will be provided to Thermic fluid heater and D.G. Sets. • Regular stacks monitoring will be done. Concrete roads will be developed within plot premises
Product and raw material handling and storage	Vaporization of raw materials or products may increase the pollutant load in air environment.	• Products and raw material will be handled, stored and transported as per manufacture, storage and import of hazardous chemical rules, 1989.
Distillation process	Release of process gas emission like PM, SOx, NOx, VOC, *etc.*	• Proposed venturi scrubber to scrub the SOx & VOC.
Solid/ Hazardous Waste handling and disposal	Odour from waste storage area may impact on workers" health.	• Good housekeeping at waste storage area shall be maintained.

Greenbelt Development	Positive impact on the ambient airquality	Regular water sprinkling and maintenance of greenbelt.
Recruitment	Positive impacts as employment generation for local population like operation and maintenance of proposed ACPD.	Local population will be given preference for employment.

4.3.4 Water Environment

Table 4-24: Impact and Mitigation Measures on Water Environment (Operation Phase)

Project Activity	Impact	Mitigation Measures
Product and raw material handling and storage	Spillage or leakage of any raw material or product may have accidental impact on nearby areas if drained into the sewer line.	• Proper storage, proper loading and unloading practice as per the SOP. • Regular maintenance of process equipment and machineries • Provision of well-designed internal drainage system with adequate slope.
Manufacturing process	• There are chances of surface water contamination if the water used for cleaning the plant floor and reaction vessels is disposed-off in surface water without treating it.	Provision of well-designed internal drainage system with adequate slope.

4.3.5 Soil Environment

Table 4-25: Impact and Mitigation Measures on Soil Environment (Operation Phase)

Project Activity	Impact	Mitigation Measures
Product and raw material handling, storage and processing	• Spillage/ leakage from storagearea may degrade the soil.	• Pucca flooring with leaked material collection system.
Solid/ Hazardous Waste handling and disposal	• Degradation of soil quality due to disposal of untreated waste	Wastes will be handled/ disposed according to the Waste Management Rules, 2016

4.3.6 Noise Environment

Table 4-26: Impact and Mitigation Measures on Noise Environment (Operation Phase)

Project Activity	Impact	Mitigation Measures
Vehicular Movement and utilities operation	• Increased Noise level due to vehicular movement and other industrial activities may lead to temporary hearing loss.	• Transportation activity will been carried out during day time only. • Regular maintenance & lubrication of utilities, equipment and vehicles will be carried out periodically. PUC Certified vehicles will be used.
Distillation process	• Exposure of continuous noise will lead to decrease of work efficiency and also may lead to any dangerous accident.	• Less noise creating machineries and motors will be used for manufacturing process. • Provision of ear muffs and ear plugs to prevent continuous noise exposure risk to employees working on site.
Green Belt Development	• Reduction in noise waves to the receptors serving as a noise barrier.	• Regular maintenance of greenbelt is been done and will be continued by providing tree guards.

4.3.7 Land Use/Land Cover

Table 4-27: Impact and Mitigation Measures on Land Use/Land Cover Environment (Operation Phase)

Project Activity	Impact	Mitigation Measures
Green belt Development	Positive change in LU/LC by conservation of land resource due to 33% of total plot area greenbelt development, additionally also provides scenic beauty to land cover.	Regular maintenance of greenbelt will be done.

4.3.8 Hydrogeology

Table 4-28: Impact and Mitigation Measures on Hydrogeology Environment (Operation Phase)

Project Activity	Impact	Mitigation Measures

Green belt Development	Loss of ground water resources.	□Ground water level is much below inthe project site, as there will be no loss in hydrogeology due to plantation. Due care will be taken in selectionof tree.

4.3.9 Geology

Table 4-29: Impact and Mitigation Measures on Geology Environment (Operation Phase)

Project Activity	Impact	Mitigation Measures
Green belt Development	Geological Structure Building Structure.	□ Due care will be taken in selectionof tree. □ Selection of trees as perguidelines prescribed by CPCB.

4.3.10 Solid/Hazardous Wastes

Table 4-30: Impact and Mitigation Measures on Solid/Hazardous Environment (Operation Phase)

Project Activity	Impact	Mitigation Measures
Product and raw material handling, storage and processing **Solid/ Hazardous WasteDisposal**	• Improper Handling and disposal of waste, processwaste and residue, discarded containers, used rubber hand gloves/pipes, used oil andspent acids.	• Solid/ Hazardous waste will be collected, stored, transported anddisposed as per the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2016
Green Belt Development	• Plant shed out materials like leaves, roots, branches etc.) from the environment for growth andother processes	• Daily collection of waste will be carried out and composting of this waste used as manure for greenbelt and vegetable farms development.

4.3.11 Risk & Occupational Hazards

Table 4-31: Impact and Mitigation Measures on Risk and Occupational Hazards (Operation Phase)

Project Activity	Impact	Mitigation Measures

Vehicle Movement andutilities operation	• Chances of vehicle collision due to vehicle failure. • Tilting of moving vehicle due to overloading. Chances of fatal incident, severe injury and loss of property due to explosion ofboiler.	• Well trained, licensed and certified motor vehicle driver will begiven job for transportation of raw material and final product. • Transport vehicle will be properly examined before transportation. • Concern officer will ensure the product and raw material loading as per its capacity before transportation. • Preventive maintenance will be done periodically of boiler.
Product and raw material handling, storage and processing	• Burn injury to workers and loss of money due to spillage and leakage of chemicals handling. • Corrosion and leaching due tospillage and leakage of chemicals.	• Adequate PPE's will be providedto workers for handling chemical, also it's use will be ensured. Standard operating procedure will be prepared and followed by workers. • Products and raw material will be handled, stored and transportedas per manufacture, storage andimport of hazardous chemicalrules,2016 • Liquid raw material will be packed in tight sealed container and shall be checked and tagged before transportation. • Solid raw material will be packed • and covered properly while transporting it through trucks
Solid/ Hazardous WasteDisposal	• Occupational hazard due to handling of solid/ hazardous waste.	• Adequate PPE's will be provided to the workers. Handling will be done under supervisor's direction.
Employment Generation	• Positive impact on local • employment for housekeeping staff and EHS vacancy.	• First preference will be given to local population of surroundingvillages.

4.3.12 Ecology and Biodiversity

Table 4-32: Impact and Mitigation Measures on Ecology and Biodiversity (Operation Phase)

Project Activity	Impact	Mitigation Measures
Vehicle Movement and utilities operation	• Settling of fugitive dust on leaves reduces the gaseous exchange process. This affects the growth of plants. • Chance of vehicle collisions with domestic animal attempting to cross the road. • Emission from stack - PM_{10}, SO_2, NO_x, VOC *etc.* will bedispersed in the air and may cause asthma, bronchitis, gastrointestinal problems etc.	• Transportation of products and raw materials will be avoided in the early morning and evening. • Transportation vehicle will be provided with power breaks and power steering. • Proper stack height will be provided to boiler. Venturi scrubber will be provided to process vent along with stack monitoring facility. • Online monitoring facility will be installed at appropriate location.
Product and raw material handling, storage and processing		
Solid/ Hazardous WasteDisposal	• In spite of there being no impact, efforts will be made not only to maintain the ecological balance of the surroundings but also to improve upon the same. Management plan for Solid/ Hazardous Waste is given in EMP.	Solid/ Hazardous waste will be collected, stored, transported and disposed as per the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2016.
Green Belt Development	Positive impact on LU/LC, air quality as a dust barrier, soil fertility and noise barrier.	Regular maintenance of greenbelt will be done.
Employment Generation	Positive impact on local employment for gardener for green belt maintenance.	First preference will be given to local population of surrounding villages.

4.3.13 Socio-Economy

Table 4-33: Impact and Mitigation Measures on Socio-Economic Conditions (Operation Phase)

Project Activity	Impact	Mitigation Measures
Vehicle Movement and Utilities operation **Greenbelt Development** **Employment Generation**	• Positive impact on employment generation for the plant operation, housekeeping • Gardner, Drivers, Security staff, EHS, Account and admin staff	• First preference will be given to local population of surrounding villages for employment
Product and raw material handling, storage and processing	• Release of SO2, Nox VOC from process emission will have negative effect on health of surrounding village population. • Generation of high noise from plants will have negative effect on hearing, mental status and digestion of surrounding village population.	• Adequate APCD will be proposed for controlling the process emission with adequate stack height. Management plan is given in EMP. • Padding and enclosing will be done to high noise generating machineries and equipment.

Table 4-34: Environmental Impact Matrix with Mitigation Measures (Operation Phase)

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Occupational	EB	SE	Total
Transportation of RM & Finished Goods	-9	-	-	-6	-	-	-	-	-6	-6	9	**-18**
Raw material storage	-6	-	-	-2	-	-	-	-9	-12	-	-2	**-31**

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Occupational	EB	SE	Total
and processing and finished products storage												
Distillation	-12	-2	-	-2				-6	-12		-9	**-43**
Liquid Water	-	-4	-	-4	-	-	-	-4	-6	-	-4	**-22**
Solid/ Hazardous Waste Disposal	-	-	-	-	-	-	-	-9	-6	-2	-2	**-19**
Green Belt Development	25	-9	12	12	12	-	-	12	-	25	12	**101**
Recruitment	-	-6	-	-	-	-	-	-4	-	-	15	**5**
Cumulative Score	**-2**	**-21**	**12**	**-2**	**12**	-	-	**-20**	**-42**	**17**	**19**	**-27**

Highest total score (+101) received for green belt development as it supports directly and indirectly for mitigating various pollution. Total Cumulative Score for various Environmental Parameters with mitigation measure is -27 which is appreciable beneficial impacts during operation phase.

4.4 SUMMARY

Impacts on land environment, air environment, water environment, noise environment, biological environment, socioeconomic environment and risk and hazard is been introduced in the chapterwith their mitigation measures for both during construction as well as operation phase. Matrix study and its representation has also been carried out and briefed in chapter. Total cumulative score for various Environmental Parameters without mitigation measures is -165 during construction phase which is adverse impact. Total cumulative score for various Environmental Parameters with mitigation measure is +16 with appreciable beneficial impact during operation phase. Air modeling study is also been introduced in the chapter showing

maximum and minimum GLC in the surrounding areas. Proper upkeep and maintenance of vehicles and APCM will reduce the impact on air environment. Unit will develop more than 33% of greenbelt within the premises. From the impact matrix table, it is observed that without mitigation measures the scoring of construction phase is -254 After taking adequate mitigation measures impact reduces to -27, which is a not an appreciable adverseimpact. it can be concluded that the overall negative impacts from various activities on different environmental parameters is negligible with proper EMP in place

5. ANALYSIS OF ALTERNATIVES

5.1. GENERAL

This chapter gives us information on alternative sites and technologies to be used for the proposed project. M/S Prayagraj Impex LLP intended for a greenfield project of 12000 Kl/Annum Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107.

5.2 ANALYSIS OF ALTERNATIVES

Three sites were considered for the construction of the proposed project. An assessment to identify the most suitable site out of the three alternate sites was carried out. The Site Suitability Analysis was undertaken for the three sites:

For identification of the most suitable Site for the development of the Facilities, the assessment was carried considering the following aspects:

- Physical settings
- Environmental Considerations and
- Social Considerations

Table 5.1: Alternate Sites Analysis

S. No.	Parameter	Option 1 (Sugarpur)	Option 2 (Naurangabad)	Option-3 (Utaka)
1	Total Land area	6500 sq m.	3500 sq m	6010 sq m.
	Forest Area	Nil	Nil	Nil
	Non-Forest Area	6500 sq m.	3500 sq m	6010 sq m.
2	Total number of Trees	20	112	225
	Trees to be relocated	2	112	225
3	Land use	Open Plot	Scrubland	Scrubland
4	Project Affected Families (PAF)	Nil	Nil	Nil

	Project Displaced Families (PDF)	Nil	Nil	Nil
5	Nearby habitations/villages	Sugarpur Village (0.65 km, SW)	Naurangabad (0.20 km, W)	Utaka Village (0.45 km, W)
6	Nearby Protected Forest/Reserve Forest	No RF or PF within 10 km	No RF or PF within 10 km	No RF or PF within 10 km
7	Nearby Water bodies	Nuh Drain (0.75 km, West) No river within 10 km radius	Gurgaon Canal Nuh Drain	Nuh Drain
8	Power connectivity	Available at project site	2 km	2.5 km
9	Road Connectivity	NH248 A at a distance of 1.75 km W Western Peripheral Expressway (KMP) at 5.5 N	NH248 A at a distance of 1 km E	MKP at a distance of 2.65 km W
10	Railway Connectivity	Palwal Railway Station (25.76 km, E)	Palwal Railway Station (18.96 km, E)	Palwal Railway Station (34.28 km, NE)
11	Ecology National Parks, Wildlife Sanctuaries, and Biosphere Reserves	None	None	None
12	Ground Water availability	Safe	Safe	Safe

Feasibility criteria for selecting the Site 1:

1. The total number of trees present within the plant boundary is near to 20 only in case of site 1 which is less in comparison to other alternate sites. And only 2 are coming in alignment which is to be transplanted to green belt.
2. The ground water available in safe zone.
3. Well Connectivity with project site.
4. Maximum area available in contagious land.
5. National Highway is 1.65 km distance.
6. No water body within 5 km radius
7. No any forest within 5 km radius

Selected site Suitability As per site selection Criteria

S. No.	Parameter	Selected site (Sugarpur)
1	Total Land area	6500 sq m.
	Forest Area	Nil
	Non-Forest Area	6500 sq m.
2	Total number of Trees	20
	Trees to be relocated	2
3	Land use	Open Plot
4	Project Affected Families (PAF)	Nil
	Project Displaced Families (PDF)	Nil
5	Nearby habitations/villages	Sugarpur Village (0.65 km, SW)
6	Nearby Protected Forest/Reserve Forest	No RF or PF within 10 km
7	Nearby Water bodies	Nuh Drain (0.75 km, West) No river within 10 km radius
8	Power connectivity	Available at project site
9	Road Connectivity	NH248 A at a distance of 1.75 km W Western Peripheral Expressway (KMP) at 5.5 N

10	Railway Connectivity	Palwal Railway Station (25.67 km, E)
11	Ecology National Parks, Wildlife Sanctuaries, and Biosphere Reserves	None
12	Ground Water availability	Safe

5.3 SUMMARY

Though this site suitable as per site selection criteria and as it is a greenfield project therefore, site #1 has been selected on the basis on no environmental sensitivity and approximate availability of infrastructure.

6. ENVIRONMENTAL MONITORING PROGRAM

6.1. GENERAL

Environmental Monitoring is an essential tool for sustainable development and ensuring effective implementation of Environmental Management Plan and Mitigation Measures suggested. A periodic environment monitoring plan enables environmental management with early forecasts for additional action required for improvement. It provides the exact idea for mitigation measures to be implemented as it is linked with actual distraction of environmental quality due to the project activities. Hence, monitoring of critical parameters of environmental quality is very essential in the routine activity schedule.

Regular monitoring of environmental parameters is immense importance to assess the status of environment during operation phase. With the knowledge of baseline environmental status scope of the monitoring of on various environmental parameters *viz.*, Air quality, Water quality, Noise, Soil characteristics, Ecology, Land use pattern and Socio-Economic will be designed.

6.2. POST PROJECT MONITORING PROGRAM

The environmental aspects to be monitored along with parameter and frequency for proposed project is mentioned in Table 6.1. The unit will allocate the sufficient budgetary provision towards implementation of EMP as well as Environmental Monitoring.

Table 6-1: Post Project Environmental Monitoring Program

S. No.		Particular	Parameter for Monitoring	Frequency of Monitoring
1.		**Air Quality**		
	i.	Ambient Air Quality Monitoring within Plant premises	$PM_{2.5}$, PM_{10}, SO_2, NO_x	Monthly
	ii.	Stack Monitoring (Thermic Fluid Heater)	PM, SO_2, NO_x, VOC	Monthly
2.		**Water Quality** (Ground and Surface)	As per IS 10500	Six monthly
3.		**Wastewater Quality**	As per consent conditions	Monthly
4.		**Noise Quality**		
	a.	Within plant premises at identified locations	Leq Levels	Monthly
	b.	Plant premises at least 5 locations	Day and night time Leq levels	Once in a quarter

S. No.	Particular	Parameter for Monitoring	Frequency of Monitoring
5.	**Soil Quality**	Routine Physical and chemical parameters, Organic matter, Moisture content, Chloride ions, Phosphorous, Nitrates, Sulfates and Cations (Al, Fe, Mg, Na, Ca, K)	Six monthly
6.	**Work Zone monitoring**	RSPM, VOC	Monthly
7.	**Solid/Hazardous waste generation**	Records of quantity of generation, handling, storage and transportation (disposal) of solid and hazardous waste will be maintained.	
8.	**Occupational Health Checkup**	Pre-employment and periodical health checkup for eye test, lung test, hearing capacity, skin test, step test *etc.* of every employee at least once in six months.	
9.	**Greenbelt Development**	Number of plantation (Units), Number of Survived Plants/ Trees, Number of Poor plant/ Trees	Once in a year
10.	**Consents and Authorization**	Consent to operate under applicable acts	Renewing 90 days before expiry of validity
11.	**Compliance of EC conditions**	Submission of 6 monthly compliance reports	June and December

Monitoring of the above parameters will be carried out to assess the performance of pollution control equipment installed to achieve the statutory norms. In case emissions/pollutant will found to exceed the norms, the 'on duty' personnel will check the relevant parameters and take appropriate corrective actions. A record of corrective and preventive action will be maintained as per requirement.

Environmental Monitoring

The environment monitoring during chemical fertilizer operation shall be conducted as follows:

Ambient Air quality;

Water and wastewater quality;

Ambient Noise levels;

Soil Quality;

Greenbelt Development;

Corporate Social Responsibility;

Occupational Health Surveillance.

A centralized environment monitoring cell has been established for this unit. Monitoring of important and crucial environment parameters is of immense importance to assess the status of environment during operation of fractional Distillation plant. With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environment conditions due to operation unit and suitable steps could be taken due in time to protect the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring. The following routine monitoring program will be implemented under the post-project monitoring program of fractional distillation plant.

Ambient Air Quality

Monitoring of ambient air quality within the plant premises will be carried at selected location as per guideline. Ambient air quality monitoring (AAQM) will be carried out for $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO *etc.* for compliance with prescribed limits of CPCB / HSPCB.

Emission from Plant

Periodical monitoring of stack attached to the process reactor and utilities will be carried out after the proposed project commissioning. $PM_{2.5}$ and PM_{10}, SOx, NOx, CO etc. will be generated in stacks and monitoring for the same will carried out to assess the performance of pollution control equipment installed. In case emissions are found to exceed the norms, the on duty 'personnel will check the relevant parameters and take appropriate corrective actions. Along with the performance test of main plant, equipment performance test & calibration of pollution control equipment will be made on a regular basis. A detailed maintenance schedule will be prepared for all pollution control systems. The maintenance will be done strictly as per the schedule.

Noise Levels

Noise levels in the work zone environment and ambient will be monitored regularly. The frequencyof noise monitoring will be once in a month in the work zone. The ambient noise levels in the surrounding villages will be monitored fortnightly basis.

Soil Sampling

Soil samples will be tested before plantation/vegetation of the area. The environment monitoringcell will co-ordinate all monitoring programs at site and data generated will be regularly furnished to the regulatory agencies.

Wastewater Quality

No trade effluent is envisaged, the water will be reused back to process, hence proposed project is Zero Liquid Discharge (ZLD) unit. Regular monthly monitoring wbe carried out for TDS, TSS, Sulphides, BOD, COD, Chloride *etc.* as per standard method.

Solid / Hazardous Waste Generation & Utilization

Management of wastes shall be done as per Hazardous and other waste (Management and Trans- boundary Movement), Rules 2016 of Environment Protection Act, 1986.The EMC will monitor and keep a record of the following:

- Generation of hazardous wastes

- Disposal of hazardous waste.
- Preparation of online manifest copy.

Green belt development

Unit will develop greenbelt area as per CPCB guidelines. Approx. 2145 m^2 (33%) area will be developed with in the factory premises as greenbelt area.

Following activities shall be carried out for maintaining the greenbelt area,

Annual planning for tree plantation with specific number of trees to be planted shall be made. The fulfillment of the plan will be monitored by the EMC every six months

A plan for post plantation care will be reviewed in the monthly meetings. Any abnormal death rate of planted trees shall be investigated and acted upon immediately

Watering of the plants, weeding, hoeing will be carried out.

Housekeeping & Work Place Monitoring

The EMC cell will keep a very close monitoring of the housekeeping activities and organize regular meetings with plant personnel and management. Workplace monitoring shall be carried out as per statutory requirement.

Occupational Health & Safety

Routine medical examination of personnel will be carried out at regular intervals of all workers to determine any changes in health condition due to the working conditions. Pre-medical check-up will also be carried out at the time of employment. Records related to occupational health check-up will be maintained in hard regularly.

Table 6.2: Monitoring Schedule for Environmental Parameter

S.No.	Particulars		Monitoring Frequency	Duration of Sampling	Important Monitoring Parameters
1.	**Air Pollution**				
	I.	Selected 4 locations in and around plant site specified by HSPCB	Twice in a week for 3 seasons	24 hrs. continuously	PM, SO_2, NOx
	ii.	Stack gas analysis in all stacks.	Once in a month	One time	As per HSPCB
	ii.	Fugitive dust sampling (if any) at work zone asper CPCB or HSPCB.	Twice in a week	24 hrs. continuously	PM, RSPM
2.	**Water and Wastewater Quality**				
	1	Surface Water	Half yearly	Grab	Parameters specified under IS:10500

	2	Water level studies in well or bore wells in plant and surrounding areas	Yearly	Once	Water levels and chemistry of water
3	**Industrial Noise Levels**				
	1.	Major noise generating sources at plant site	Every fortnight	24 hrs. continuous with 1 hrs. interval	Noise level in dB(A)
	2.	Along Road for transportation noise	Fortnight	24hrs. continuous with 1hr. interval	Noise level in dB(A)
	Ambient Noise Levels				
		4 Locations as in Chapter 3	Fortnight	24 hrs. Continuous with 1hr interval	Noise level in dB(A)
4.	**Soil Characteristics**				

	1	Selected 4 locations incore and buffer zone in nearby villages	Half Yearly	One Grab sample	As per HSPCB/Consent order
5.	Work zone	At plant site	yearly	Once in work place	Dust, Noise, etc.
6.	Enterprise Social commitment	In core and buffer zonein nearby villages	Half yearly	Once	Activities done by Client
7.	Occupational Health Surveillance	At plant premises	Half yearly	Once	Employee Health Register
8.	Greenbelt Development	Number of plantation(Units), Number of Survived Plants/ Trees, Number of Poor Plant/ Trees	Yearly	Once	Tress, survival rate, landscape area.
9.	Environmental Audit	As per Directions of Honorary High Court,	Yearly	Once	As per HSPCB
10.	Consents and Authorization	Consent to Operate under applicable acts	Renewing 90 days before expiry of validity	Once	Before 90 days ofexpiry
11.	Compliance of EC Conditions	Submission of 6 Monthly Compliance Reports		Twice in a year	As per EC conditions

6.3. MONITORING METHODOLOGIES

Method of environmental sampling and analysis method to be used is as per the guidelines providing by MoEFCC/CPCB/HSPCB. The method followed will be recommended/standard method approved/recommended by MoEFCC/ CPCB.

Table 6-3: Environmental Sampling and Analysis

S. No.	Description	Method	
		Sampling/ Preservation	Analysis
A	**Air Environment**		
1.	Micro-meteorological data	Mechanical or automatic weather station/ Meteorological Department	--
2.	Ambient Air Quality	Samplers (Designed as per USEPA) to collect $PM_{2.5}$, PM_{10} & the gaseous samples	Any standard methods such as IS 5182, CPCB guideline, ASTM *etc.*
B	**Water and Waste Water**		

1.	Ground Water	Standard Methods for Examination of Water and Wastewater published by APHA 21st edition, 2005	IS10500:2012 and Standard Methods for Examination of Water and Wastewater published by APHA 21st edition, 2005
2.	Surface Water		
3.	Wastewater		
C	**Noise**	Instrument: Sound level meter	--

6.4. INFRASTRUCTURAL REQUIREMENT

Details	Indicators	Stage	Responsibility
Pre-Construction Stage: Environmental Management Indicators and Monitoring Plan			
Suitable location for dumping of construction wastes has to be identified.	Dumping locations	Preconstruction	Projects
Construction Stage: Environmental Condition Indicators and Monitoring Plan			
Dust suppression at construction site.	Construction site	Construction	Projects
Operation Stage: Management & Operational Performance Indicators			
Solid waste generation, utilization and handling.	As per guidelines of statutory bodies	Operation	Concerned Plant Units / EMC
Hazardous waste dumping, storage and disposal as specified by statutory authorities.	As per the notifications/guidelines specified by statutory authorities.	Operation	Concerned Plant Units / EMC
Stack Emissions	All parameters as specified for stacks by Statutory Authorities	Operation	Concerned Plant Units / EMC
Ambient air quality, and Noise levels.	All parameters as specified by Statutory Authorities	Operation	Concerned Plant Units / EMC

6.4.1. Data analysis

All environmental monitoring data will be stored as a computer database for proper storage, retrieval and interpretation. Records will be maintained to keep a track of monitored parameters and causes of non-conformity with the permissible limits. Other than monitoring data, record of equipment performance test, calibration of pollution control equipment, equipment maintenance schedule will be maintained.

6.4.2. Reporting System

The environmental department in respect of operation of pollution control facility shall maintain following records. Instruction manual for operation and maintenance of pollution control equipment. Log sheet for self-monitoring of pollution control equipment. Manual for monitoring of Air, water for Ambient conditions. Instruction manual for monitoring of water, solid and gaseous parameter discharged from the factory and also for various parameters of pollution control facilities. Stationary records as per the Environmental Acts. Monthly and annual progress reports. Medical checkup of employees. Regularly these documents & records shall be reviewed for necessary improvement of the monitoring plan/mitigation measures/environmental technologies as well as for necessary actions of Environmental Management Cell.

6.5. BUDGET FOR EMPg

On regular basis, environment management cell will inspect the necessity & availability of the materials, technologies, services & maintenance works. The cells will make appropriate budget for

this purpose. Regular record review for change in financial requirement of environment management will be done and appropriate budgetary provisions are made. With other budget, budget for Environmental Management shall also will be prepared and revised regularly as per the requirement.

Table 6-4. Budgetary Allocation for Environmental Monitoring Program

S.No.	Particulars	Cost (Rs. Lakhs)
1.	Air, Water, Soil & Noise Monitoring	3.5
2.	Greenbelt/Plantation	0.50
3.	CER Monitoring	0.5
4.	Occupational Health	0.5
	Total	**5.0**

6.6. SUMMARY

The environment monitoring for the proposed Crude oil Fractional Distillation Plant operation will be conducted asfollows:

- Ambient Air quality;
- Water and wastewater quality;
- Ambient Noise levels;
- Soil Quality;
- Greenbelt Development;
- CER
- Occupational Health Surveillance.

Monitoring of important and crucial environment parameters is of immense importance to assess the status of environment during operation of 12000 KL/annum Fractional distillation plant of Prayagraj Impex LLP Ltd. will formulate the Environmental Management Cell. The EMC shall be responsible for all activities. All environment monitoring and relevant operational data will be storedin a relational database. Regular data extracts and interpretive reports will be sent to the regulator. The capital cost of Environmental Monitoring Program for Air, Water Soil and Noise and other activities will be **Rs. 5.0 Lakhs**.

7. ADDITIONAL STUDIES

7.1 GENERAL

This chapter includes a brief description of public hearing details, Risk & Hazard study, Disaster Management Plan, Traffic Study, *etc.*

7.2 PUBLIC CONSULTATION

Public hearing will be conducted after submitting draft EIA report and the action plan will be prepared accordingly minutes of public hearing.

7.3 RISK & HAZARD STUDY

Risk is an expression of chance, a function of the likelihood of an adverse impact and the magnitude of its consequences. Environmental Risk Assessment is the process of the evaluating the likelihood of adverse effect in, or transmitted by the natural environment from hazards that accompany human activities. Qualitative and Quantitative Risk assessment is elaborated in this chapter.

Risk assessment is carried out for the following objectives:

1. To identify hazard and risk resulting from the hazards
2. To study and foresee the effects of such risks on the workers, public, property and environment and to find out necessary control measures to prevent or minimize risk.
3. To get the necessary information for emergency planning and evacuation.

The methodology includes,

Hazard identification,

- Based on Physico-chemical properties like flash point, Toxicity, quantity and state of chemicals (Raw materials, products and solvents) storage and handling activities at site.
- Transportation of Raw materials and products

Construction phase

The construction of the plant is expected to last for about 1 year. The hazards involved in various construction related activities like excavation, working at height, slip, trips, fall, collapse, Noise, Material handling, hand/arm vibration syndrome, electricity, vehicular movement have been considered.

Diesel, lubricating oil and similar kind of material

The diesel is required for DG Set operation in case of power outage by the electricity supply company. Generally, the storage of diesel is 4 to 5 drums of 100 liters each. Furnace oil/ LDO will be stored in vertical cylindrical tank of 100 KL capacity. The lubricating oil is required for the gear boxes attached with various equipments (Reactors). The hazard involved in handling these materials is leakage spillage. Another hazard associated with lube oil is slippage of a person if the lube oil spills on the road, it can also create land contamination. The other significant hazard with these materials is fire as both liquids can catch fire being hydrocarbons. The used lubricating oils and sludge at the bottom of diesel tank is a hazardous waste and should be recycles to the authorized agents only. The hazards associated the production and handling of various utilities like electricity, compressed air, steam etc. are common in any process industry and the control

of these hazards associated withthem can be controlled in a normal way. Their hazard control methodology is well known.

Table 7.1: Control measures for hazards involve during construction phase

S.No.	Process Or Activity	Associated Hazards	Health & Safety Impact (Risk)	Initial Risk			Mitigation/ Control Measures	Residual Risk		
				Severity	Likelihood	Risk		Severity	Likelihood	Risk
1	Site Preparationand gardening	• Dust generation & increase in SPM/ RSPM in air	• Health effect on workers and surrounding People • Air Pollution	2	C		• Regular water spray on the roads to avoid dust generation. • Use of PPE like dust mask • Speed control of the vehicles on construction site.	1	B	L
2	Excavation	• Dust generation & increase in SPM/ RSPM in air • Caving the sides of pit	• Health effect on workers and surrounding People • Air Pollution • Risk of injury to workers	3	C		• Use of PPE • Water spray on the ground before excavation. • Work permit procedure to be followed • Shoring of the sides while manual digging the ground.	2	B	L
3	Material Handling	• Back pain due to improper lifting	• Health effect	1	E		• Training of the workers in Manual handling. • Lifting of material should be limited to max. 25 Kgs.	1	C	L

4	Operation with construction equipments likemixer, dumper JCB etc.	• Noise generation, • Chances of accident	• Temporary Hearing loss due to noise • Injury to worker/ one who comes in contact.	2	E	M	• Use of ear muffs and ear Plugs. Proper and regular maintenance of noise producing machinery to be done. • Barricading and no entry zone will be marked and confirmed.	1	C	L
5	Movement of Material supply	• Chances of accident due to movement of trucks on the road • Noise generation	• Injury • Health effect	2	E	M	• Use of trained driver with sufficient experience for operation of material handling equipments	1	C	L
6	Structural work,welding, cutting	• Spark generation, and chances of accident during erection cutting	• Loss of vision, • Injury	3	C	M	• Use of PPE (Welding Glasses) • Permit procedure to be followed. • Job safety analysis to be done for doing the work in confined space or on height.	1	B	L
7	Construction work at height	• Chances of fall from height	• Injury	3	C	M	• Use of PPE like safety Harness to bedone. • Installation of scaffolding will be inspected and safety will be ensured.	1	B	L

8	Disposal of construction debris	• Generation of dust	• Inhalation of dust and subsequent health effects	2	C		• Debris to be transported in the covered trucks only. • Disposal of solid waste to be done at a demarked site only.	1	B	L
9	Use of electrically operated machines andwater pump	• Hazards dueto electrical shock	• The electrical shockcan result into serious injury or can be fatal	5	A		• People to be trained in electrical safety and handling of electrical equipments • Use of EILCB and MCB to avoid shocks • No loose connections and open electrical connections, no loose or hanging wires. • Use of 24 volts lighting for confined space.	2	A	L
10	Final clearing of the site disposal of solid and hazardous waste like pac king material, used color drums	• Exposure injury while handling solid and hazardous waste	• Health affect andminor injury • Land Pollution	3	C		• The disposal of the debris to be doneon the marked site only • People should be trained in handling such debris. • Material handling equipments to be used for handling of such construction	1	B	L

							debris disposal			

7.3.1 Qualitative Risk Assessment

In Qualitative Risk Assessment, risk has been analyzed using methodology called HIRA-Hazards Identification & Risk Assessment. In HIRA, major manual activities carried out by plant personnel as well as contract labors have been considered.

Qualitative Risk Assessment has been carried out for the following areas:

Risk involved in various processes / process equipment cannot be addressed completely by consequence analysis. As a conservative approach, these risks have been considered separately under this topic. The approach is to identify hazards associated in operation of equipment as well as in processes, assessing its impacts, ranking the risk posed by it and finally to propose remedial actions/mitigation measures such that the risk is minimized to tolerable level. The Risk Matrix presented in Table 7.2, is referred in evaluating the assessment. Risk acceptability criteria given in Table 7.3.

Table 7-2: Risk Matrix for Qualitative Risk Assessment

LIKEHOOD/ PROBABILITY		SEVERITY				
		Catastrophic (Death/ System Loss)	Major/ Critical (Serious Injury/ Illness)	Moderate (Less Serious Injury/ Illness)	Minor/ Marginal (Minor Injury/ Illness)	Insignificant /Negligible (No injury /Illness)
		5	4	3	2	1
Almost Certain	E	H	H	H		
Likely	D	H	H			L
Possible	C	H				L
Unlikely	B				L	L
Impossible	A			L	L	L

Table 7-3: Risk Acceptability Criteria

Risk Range	Risk Acceptability Criteria	Remarks
H	Unacceptable/ High	Management's Decision/Action Plan Required. Potential off-site Impact.
	Medium	Generally Minor Impact. Acceptable with Management's Review. Specific monitoring or SOP to be followed.
L	Low	Acceptable without Review. Manage through Routine Procedure.

Table 7.4: Control Measures for Diesel, Lubricating Oil and Furnace Oil

S.No.	Process Or	Associated	Health & Safety	Initial Risk	Mitigation/	Residual Risk

	Activity	Hazards	Impact (Risk)	Severity	Likelihoo	Risk	Control Measures	Severity	Likelihoo	Risk
1.	Handling and storage of Diesel ,lubricating oil and Furnace Oil	Spillage leakage while transfer from the drum	Land pollution can lead to fire if excessive spillage of diesel/ Furnace oil isthere.	2	C		• Use a secondary container whilestorage and transfer of lubricating oil, Furnace oil and diesel. • Use of a spill kit in case of spillage of the material • Store the drums in the shed andon the concrete flour to avoid soil contamination • Ensure availability of Fire extinguisher in storage shed daily.	1	B	L

7.3.2 Quantitative Risk Assessment

Quantitative Risk Assessment (QRA) is a structured approach to identifying and understanding the hazards and risks associated with Storage and Handling of flammable/ toxic chemicals. The assessment starts by taking into account an inventory of hazardous chemicals stored, likelihood of leakage/ spillage associated with it and selecting the worst-case scenario for consequence estimation. Finally, suggesting the measures to minimize or mitigate risks to meet appropriate acceptability criteria. The planning for emergency evacuation shall be borne in mind whilst interpreting the results.

Consequence analysis: In a plant handling hazardous chemical, the main hazard arises due to storage and handling of hazardous chemicals as mentioned above. If these chemicals are released into the atmosphere, it may cause damage due to resulting fires or vapor clouds. Blast overpressures depend upon the reactivity class of material between two explosive limits.

Damage criteria: In consequence analysis studies, in principle three types of exposure to hazardous effects are distinguished:

i. Heat radiation, from jet, pool fire, a flash fire or a BLEVE
ii. Explosion
iii. Toxic effects, from toxic materials or toxic combustion products.

The chosen damage criteria are given and explained as per the Guidelines for CFD Software & Purple Book for QRA released by Centre for Chemical Process Safety (CCPS).

7.3.3 Planning

Event Classification and Modes of Failure:

Hazards that can lead to accidents in operations are discussed in this section. Important hazardous events are classified in Table 7.5

Table 7-5: Event Classification

Type of Event	Explanation
BLEVE	Boiling Liquid Evaporating Vapor Explosion; may happen due to catastrophic failure of refrigerated or pressurized gases or liquids stored above their boiling points, followed by early ignition of the same, typically leading to a fire ball
Deflagration	Is the same as detonation but with reaction occurring at less than sonic velocity and initiation of the reaction at lower energy levels
Detonation	A propagating chemical reaction of a substance in which the reaction front advances in the unreacted substance at or greater than sonic velocity in the unreacted material
Explosion	A release of large amount of energy that form a blast wave
Fire	Fire
Fireball	The burning of a flammable gas cloud on being immediately ignited at the edge before forming a flammable/explosive mixture.
Flash Fire	A flammable gas release gets ignited at the farthest edge resulting in flash-back fire
Jet Fire	A jet fire occurs when flammable gas releases from the pipeline (or hole) and the released gas ignites immediately. Damage distance depends on the operating pressure and the diameter of the hole or opening flow rate.
Pool Fire	Pool fire is a turbulent diffusion fire burning above a horizontal pool of vaporizing hydrocarbon fuel where the fuel has zero or low initial momentum
Spill Release	'Loss of containment'. Release of fluid or gas to the surroundings from unit's own equipment / tanks causing (potential) pollution and / or risk of explosion and / or fire
Structural Damage	Breakage or fatigue failures (mostly failures caused by weather but not necessarily) of structural support and direct structural failures
Vapor Cloud Explosion	Explosion resulting from vapor clouds formed from flashing liquids or non-flashing liquids and gases

Hazard and Damage Assessment:

Toxic, flammable and explosive substances released from sources of storage as a result of failures or catastrophes, can cause losses in the surrounding area in the form of:

- Toxic gas dispersion, resulting in toxic levels in ambient air,
- Fires, fireballs, and flash back fires, resulting in a heat wave (radiation), or
- Explosions (Vapor Cloud Explosions) resulting in blast waves (overpressure).

Consequences of Fire/Heat Wave:

The effect of thermal radiation on people is mainly a function of intensity of radiation and exposure time. The effect is expressed in term of the probability of death and different degree of burn. The consequence effects studied to assess the impact of the events on the receptors are:

Table 7-6: Damage due to Radiation Intensity

Radiation (kW/m^2)	Damage to Equipment	Damage to People
1.2	Solar heat at noon	
1.6	-	Minimum level of pain threshold
2.0	PVC insulated cable damage	
4.0	-	Causes pain if duration is longer than 20 sec. But blistering is unlikely.
6.4	-	Pain threshold reached after 8 sec. Second degree burns after 20 sec.
12.5	Minimum energy to ignite wood with a flame; melts plastic tubing.	1% lethality in one minute. First degree burns in 10 sec.
16.0	-	Severe burns after 5 sec.
25.0	Minimum energy to ignite wood at identifying long exposure without a flame.	100% lethality in 1 min. Significant injury in 10 sec.
37.5	Severe damage to plant	100% lethality in 1 min. 50% lethality in 20 sec. 1% lethality in 10 sec.

Consequences of Overpressure:

The effects of the shock wave vary depending on the characteristics of the material, the quantity involved and the degree of confinement of the vapor cloud. The peak pressures in an explosion therefore vary between a slight over-pressure and a few hundred kilopascals (kPa). Whereas dwelling is demolished and windows and doors broken at overpressures as low as 0.03- 0.1 bar. Direct injury to people occurs at greater pressures. The pressure of the shock wave decreases rapidly with the increase in distance from the source of the explosion.

Table 7-7: Overpressure Damage

Overpressure (bar)	Damage
0.001	Annoying noise (137 dB if of low frequency 10-15 Hz)
0.002	Loud noise (143 dB, sonic boom glass failure
0.003	Occasional breaking of large glass windows already under strain
0.007	Breakage of small windows under strain
0.010	Typical pressure for glass breakage
0.020	projectile limit; some damage to house ceilings; 10% window glass broken
0.027	Limited minor structural damage
0.034	Large and small windows usually shattered; occasional damage to window
0.034 to 0.068	frames
0.048	Minor damage to house structures
0.068	Partial demolition of houses, made uninhabitable
0.068 to 0.136	Corrugated asbestos shattered; corrugated steel or aluminum panels, fastenings fail, followed by buckling, wood panels (standard housing) fastenings fail, panels blown in
0.088	Steel frame of clad building slightly distorted
0.136	Partial collapse of walls and roofs of houses
0.136 to 0.204	Concrete of cinder brick walls, not reinforced, shattered

Overpressure (bar)	Damage
0.157	Lower limit of serious structural damage
0.170	50% destruction of brickwork of houses
0.204	Heavy machines (3,000 lb) in industrial building suffered little damage; steel frame building distorted and pulled away from foundations.
0.204 to 0.272	Frameless, self -framing steel panel building demolished; rupture of oil storage tanks
0.272	Cladding of light industrial buildings ruptured
0.340	Wooden utility poles snapped; tall hydraulic press (40,000 lb) in building slightly damaged
0.340 to 0.476	Nearly complete destruction of houses
0.476	Loaded train wagons overturned
0.476 to 0.544	Brick panels, 8-12 inches thick, not reinforced; heavy machine tools (7,000 lb) moved and badly
0.612	Loaded trains boxcars completely demolished
0.680	Probable total destruction of buildings; heavy machines tools (7,000 lb) moved and badly damaged, very heavy machines tools (12,000 lb) survived.
20.414	Limit of crater lip

Source: CCPS Consequence analysis of chemical release

Consequences of Toxic Release:

The effect of exposure to toxic substance depends upon the duration of exposure and the concentration of the toxic substance.

Short-term exposures to high concentration give Acute Effects while long term exposures to low concentrations result in Chronic Effects.

Only acute effects are considered under hazard analysis. Since they are likely credible scenarios. These effects are:

- Irritation (respiratory system skin, eyes)
- Narcosis (nervous system)
- Asphyxiation (oxygen deficiency)
- System damage (blood organs)

Following are some of the common terms used to express toxicity of materials.

- Threshold Limit Value (TLV): it is the permitted level of exposure for a given period on a weighted average basis (usually 8 hrs. for 5 days in a week)
- Short Time Exposure Limit (STEL): it is the permitted short term exposure limit usually for a 15 minutes exposure.
- Immediately Dangerous to life and health (IDLH): It represents the maximum concentration of a chemical from which, in the event of respiratory failure, one could escape within 30 minutes without a respirator and without experiencing any escape/impairing (eg. Severe irritation) or irreversible health effects.
- Lethal Concentration Low (LCLo): It is the lowest concentration of a material in air, other than LC50, which has been reported to cause a death in human or animals.
- Toxic Concentration Low (TCLo): It is the lowest concentration of a material in air, to which humans or animals have been exposed for any given period of time that has produced a toxic effects in humans or produced carcinogenic, neo-plastigenic or teratogenic effect in humans or animals.
- Emergency Response Planning Guidelines 1 (EPRG1): The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour (without a respirator) without experiencing other than mild transient adverse health effects or without perceiving a clearly defined objectionable odor.
- Emergency Response Planning Guidelines 2 (ERPG2): The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action.
- Emergency Response Planning Guidelines 3 (ERPG3): The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

7.3.4 Meteorology

Atmospheric stability plays an important role in the dispersion of the chemicals. "Stability means, its ability to suppress existing turbulence or to resist vertical motion". Atmospheric stability plays an important role in the dispersion of chemicals. "Stability means, its ability to suppress existing turbulence or to resist vertical motion". Variations in thermal and mechanical turbulence and in wind speed are greatest in the atmospheric layer in contact with the surface. The air temperature has influenced these turbulences greatly and air temperature decreases with the height. The rate at which the temperature of air decreases with height is called Environment Lapse Rate (ELR). It will vary from time to time and from place to place. The atmosphere is said to be stable, neutral or unstable according to ELR less than, equal to or greater than Dry Adiabatic Lapse Rate (DALR), which is a constant value of 0.98 ºC per 100 meters.

Pasquill Stability Classes

Pasquill has defined Six (6) stability classes.

A - Extremely unstable.

B - Moderately unstable

C - Slightly unstable.

D - Neutral

E - Slightly stable.

F - Moderately stable.

Three prime factors that defines Stability

- Solar radiation
- Night-time sky over
- Surface wind

When the atmosphere is unstable and wind speeds are moderate or high or gusty, rapid dispersion of vapors will occur. Under these conditions, air concentrations will be moderate or low and the material will be dispersed rapidly. When the atmosphere is stable and wind speed is low, dispersion of material will be limited and air concentration will be high.

7.3.5 Weather Condition

Following Weather conditions are selected for consequence analysis

Table 7-8: Weather Condition Selected

Time	Remarks	Weather Condition		
		Temperature in °C	Wind speed m/s	Stability Class
Day Time	Prevalent during the day, most times of the year	25.8	4	C
Night Time	Prevalent during the night, most times of the year	21.7	3	D
Monsoon Period	Prevalent during the monsoon months	24.0	5	D

7.4 SELECTION OF MAXIMUM CREDIBLE LOSS SCENARIOS (MCLS')

Following points are considered while selecting the release scenarios:

- Flash point for flammable chemicals
- IDLH of Toxic chemicals
- Operating/ Storage Temperature and Pressure of the material
- Total inventory of the material

7.4.1 Results of Consequence Analysis

- Summary of effect distance (in meter) for worst case scenario of hazardous chemical considered for consequence analysis is given below:

Chemical/ Scenario	Effect Distance in Meters at specific Weather condition		
	At Radiation Level 4 kW/m²	At Overpressure 0.02 bar	IDLH Concentration
Acetaldehyde Tank	320 (3/D)	1647 (4/C)	-
Acetonitrile Tank	705 (5/D)	614 (4/C)	-
Benzene Tank	147 (5/D)	315 (3/D)	197 (3/D)
Ethyl acetate Tank	122 (3/D)	569 (5/D)	-
Styrene Tank	56 (5/D)	132 (5/D)	-
Toluene Tank	234 (5/D)	269 (3/D)	214 (3/D)

- The effect of late pool fire due to 10 mm leak scenario is confined to the site boundary

- It can be seen from the summarized table above that the risk of late pool fire is highest in worst case scenario of release of Acetonitrile in 5/D weather condition for 4 KW/m^2 radiation level.
- Out of all the toxic chemicals like Benzene, Toluene & Hydrogen peroxide, dispersion of Toluene covers more distance in case of IDLH concentration at 3/D weather condition.

Preventive Measures will be adopted:

- Evacuation routes will be planned such that alternate route is available from any corner in more than one direction.
- Extra precautions will be taken in loading/ unloading of flammable/toxic chemicals.
- Firefighting arrangements shall be provided as per the guidelines of OISD.
- In case of release of toxic chemicals, evacuation will be done up to 214 meters till there is clarity about which chemical has leaked.
- Tanker Storage:
  - OISD guidelines will be followed in design, installation and maintenance of UG storage tanks.
  - Separate Isolated Storage area will be constructed as per explosive department requirement.
  - Company will be carried out to decide the type of electric installation.

NUMERICAL MODEL OF TERRAIN

Dispersion of chemicals in the atmosphere is largely influenced by the topography of the site under consideration. The terrain elements such as land cover (vegetation, water bodies etc.), urban canopy (roughness) and significantly the obstacles (buildings, process units, ground level tanks etc.). Wind flow over each of such terrain elements shall be disturbed in terms of drag (boundary layer phenomena) and turbulence (mixing). Thus, the significant topographical features were digitized to create numerical terrain model. Panache interface is customized to generate such signification features with ease of use. Terrain model created for Prayagraj Impex LLP is shown in the Fig 1.

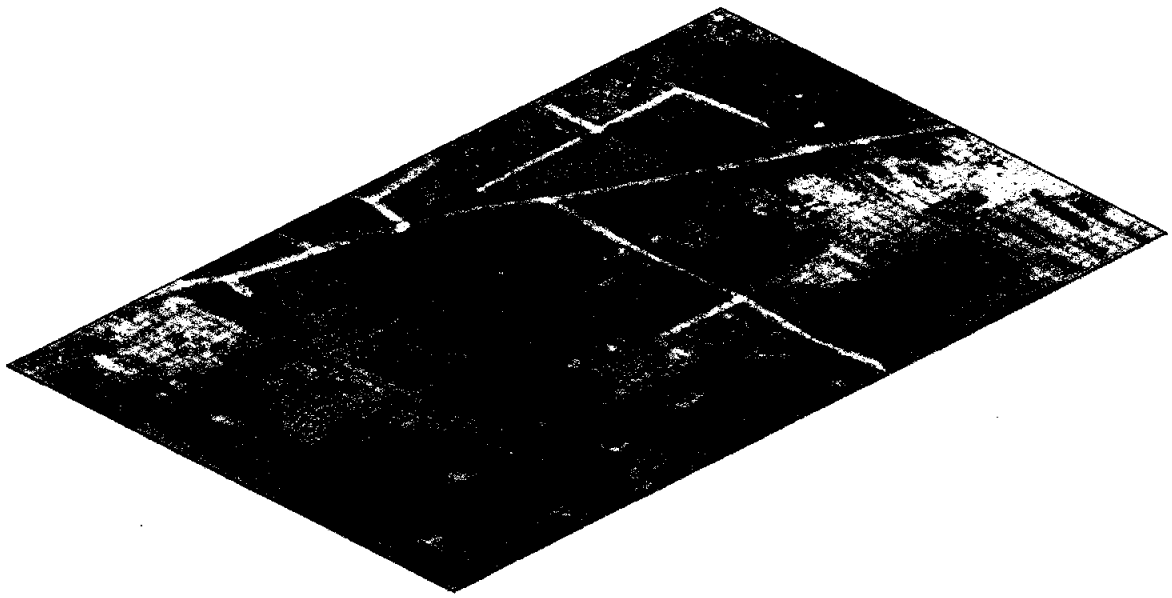
Source: Google Earth

Fig.7.1: Topographical Model Setup as Digitized in Panache (flamboyance)

Weather Scenario Considered for Dispersion

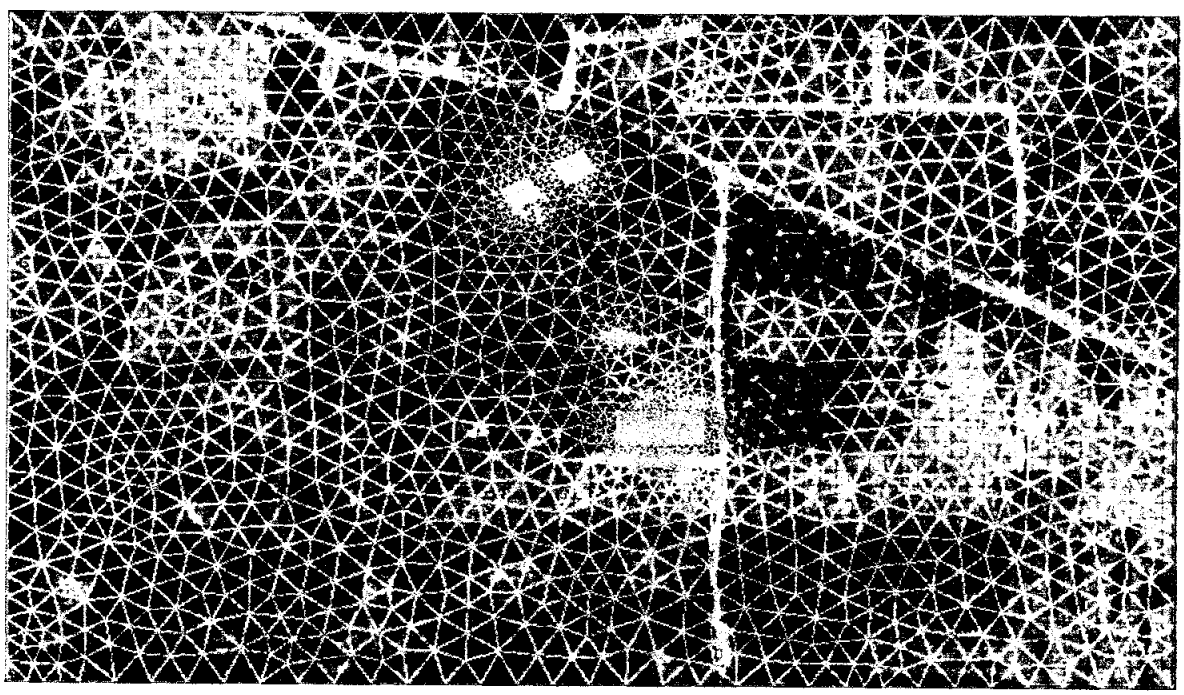
Scenario	Wind Direction	Wind Speed, m/s	Stability Class
2F	Plant Site:292.5° N	2.0	F
5D		5.0	D

Maximum Credible Accident - Release Scenario of Acetone



Source: CFD Software

Fig.7.2: Topographical Model Setup as Digitized in Panache

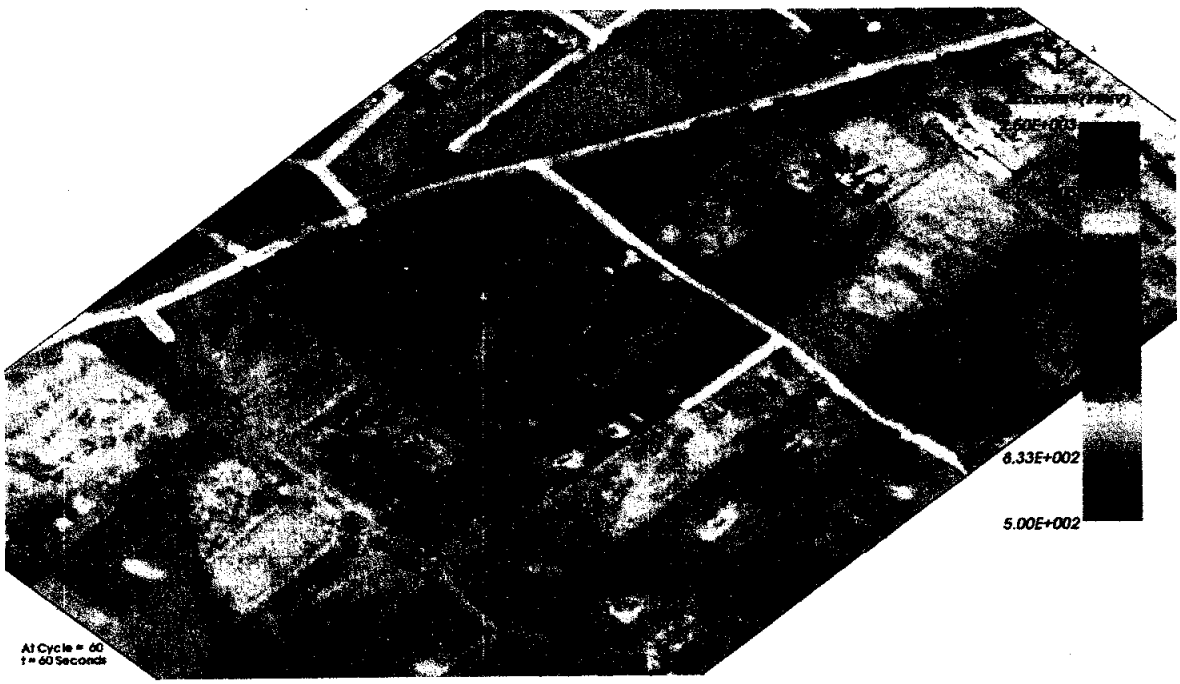


Source: CFD Software

Fig.7.3: Mesh Considered for a Plant Site Simulation

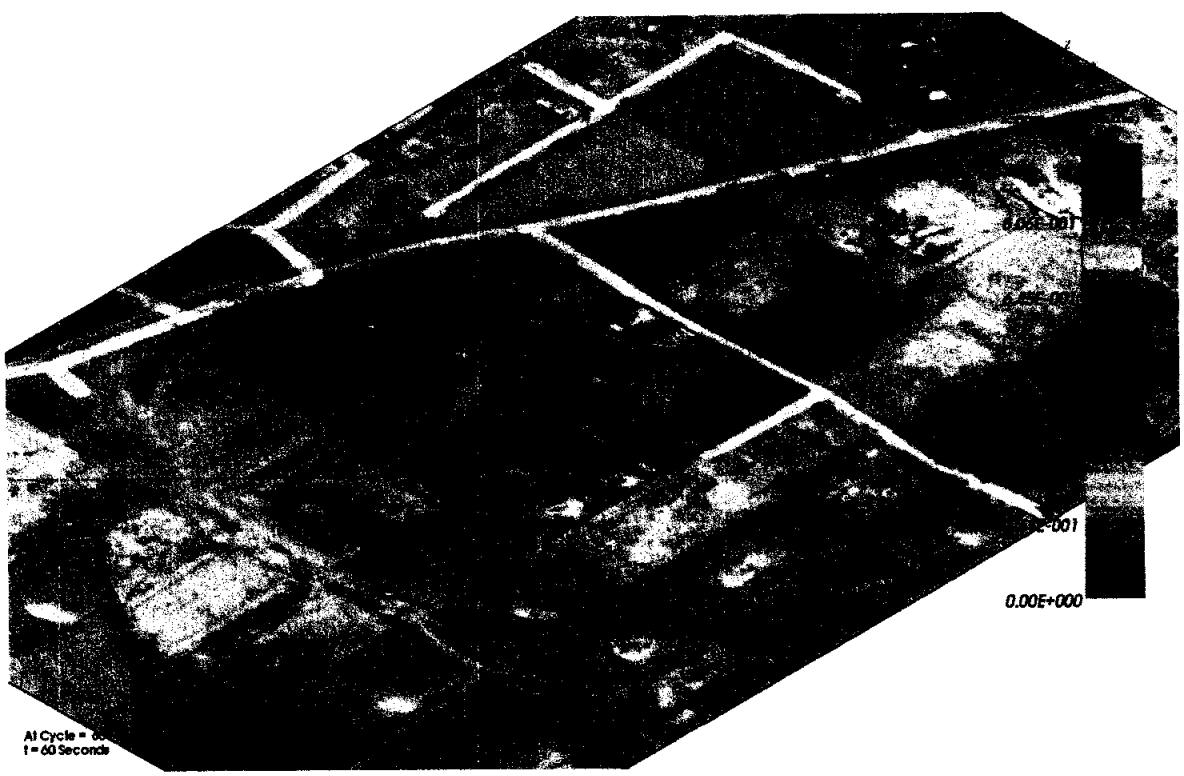
Nature of Hazard	Name of Haz. Chemicals	Quantity Max. that can be stored	Place of storage	Operating Parameters

Flammable	Acetone	70 KL	Tank	Under pressure	Ambient

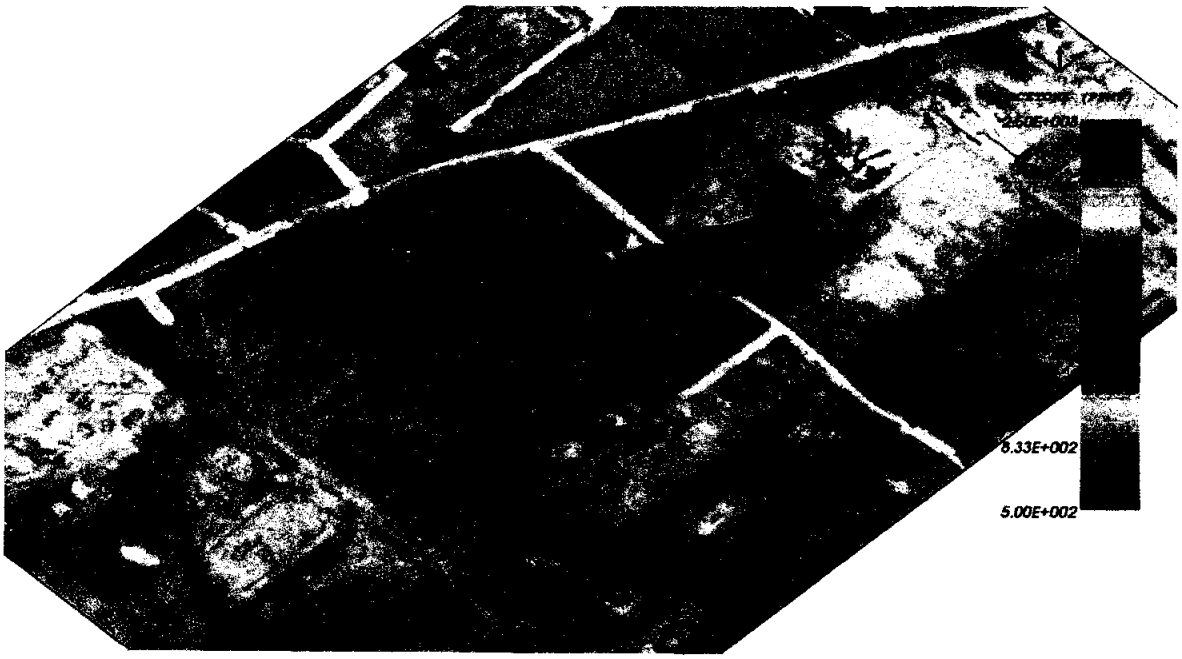


Source: CFD Software

Fig.7.4: Release of Acetone at Times 60s (Wind Flow-2F)

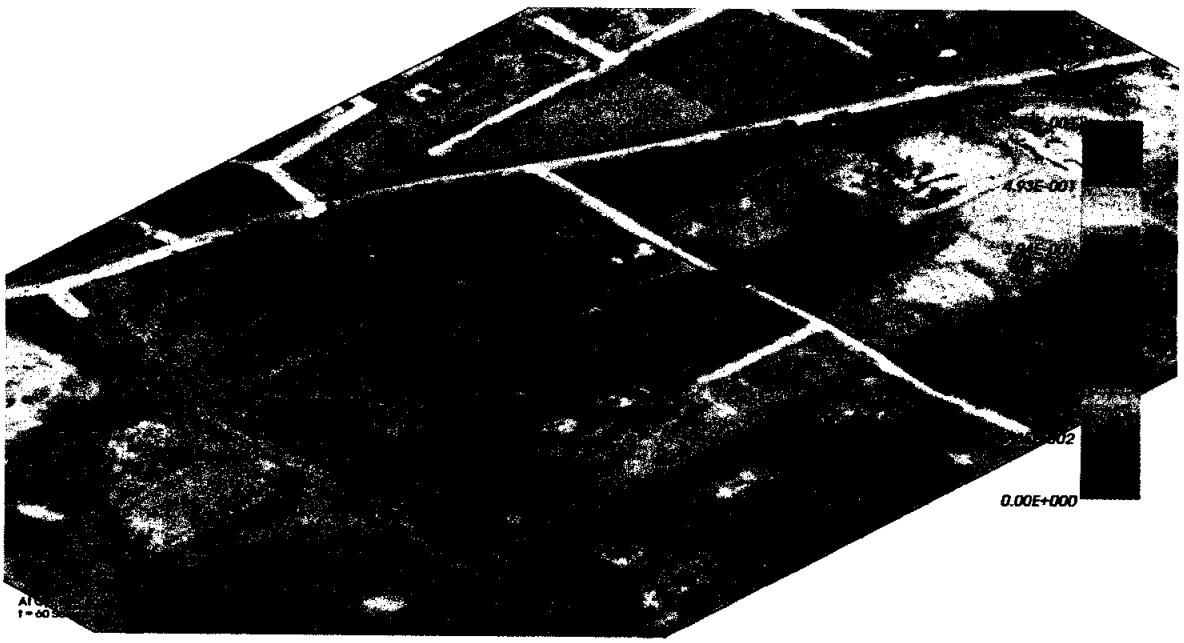


Source: CFD Software



Source: CFD Software

Fig.7.5: Release of Acetone at Times 60s (Wind Flow-5D)



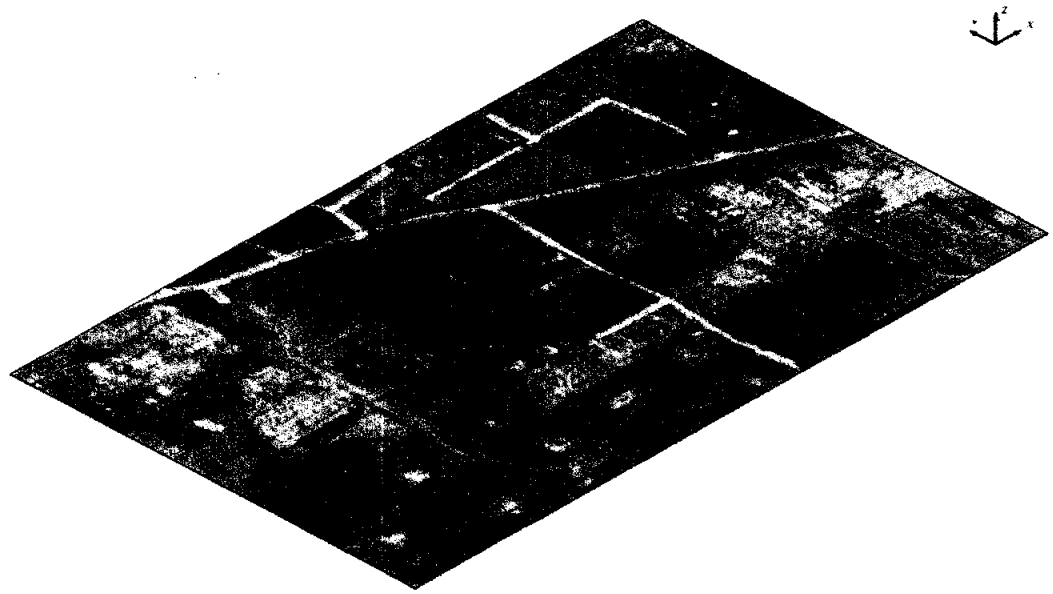
Source: CFD Software

Threshold Distances for Dispersion Scenario Modelled- Acetone

Material	Weather Scenario	Release Concentration (At 60s)	Distance
Acetone	2F	500 PPM	At source to 51.82 meters
		500 to 2500 PPM	51.82 to 66.65 meters
	5D	500 PPM	At source to 111.96 meters

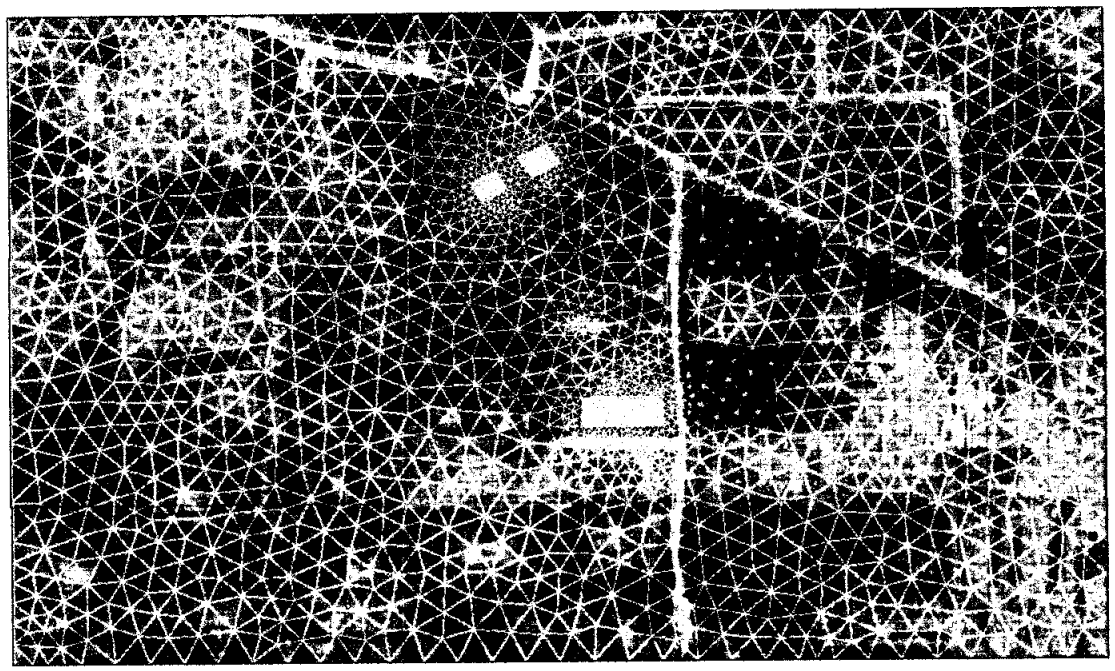
		500 to 2500 PPM	111.96 to 152.70 meters

Maximum Credible Accident - Release Scenario of Toluene



Source: CFD Software

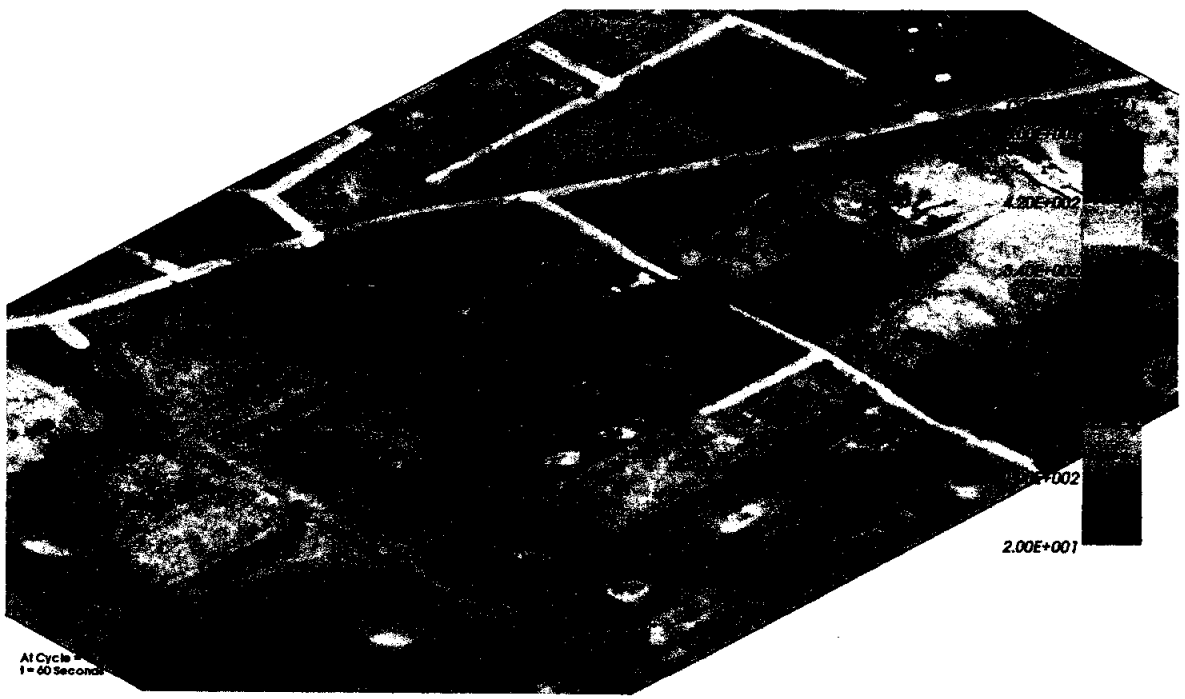
Fig.7.6: Topographical Model Setup as Digitized in Panache



Source: CFD Software

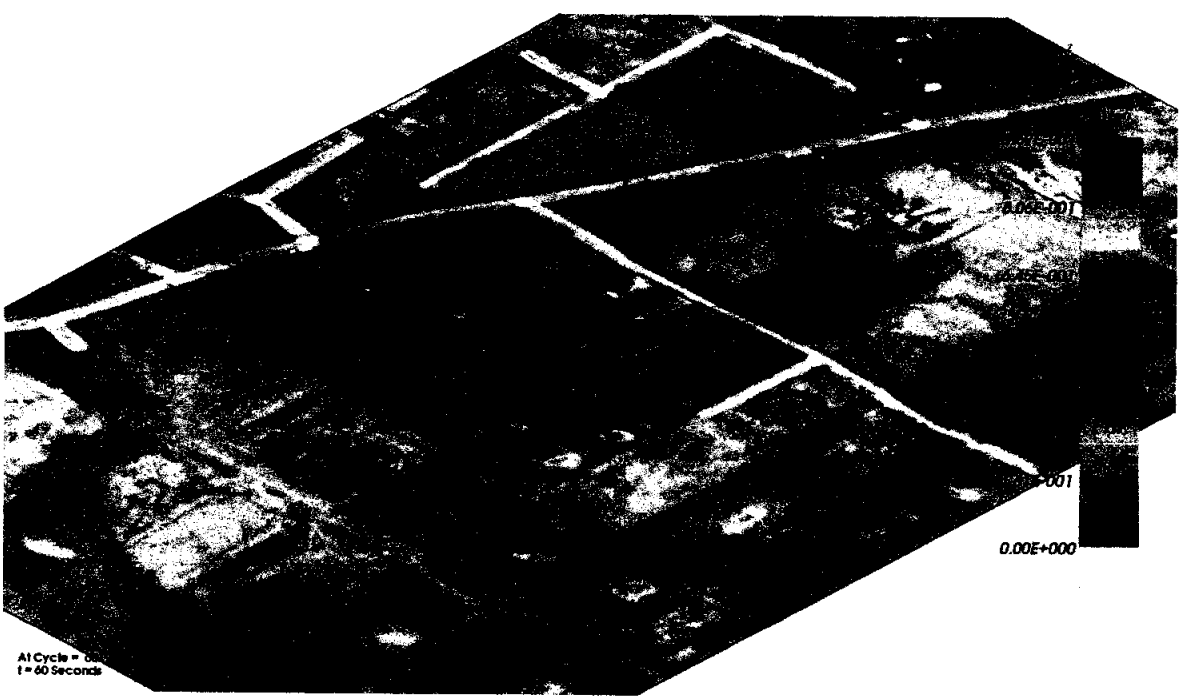
Fig.7.7: Mesh Considered for a Plant Site Simulation

Nature of Hazard	Name of Haz. Chemicals	Quantity Max. that can be stored	Place of storage	Operating Parameters	
Flammable	Toluene	70 KL	Tank	Under pressure	Ambient

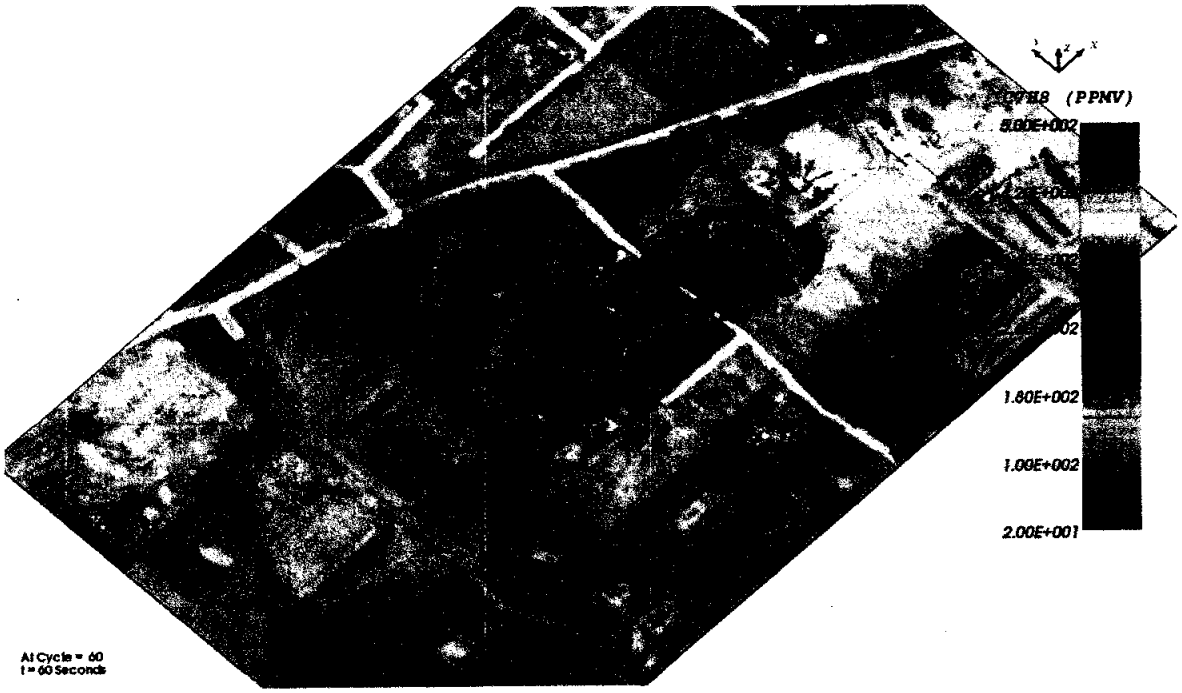


Source: CFD Software

Fig.7.8: Release of Toluene at Times 60s (Wind Flow-2F)

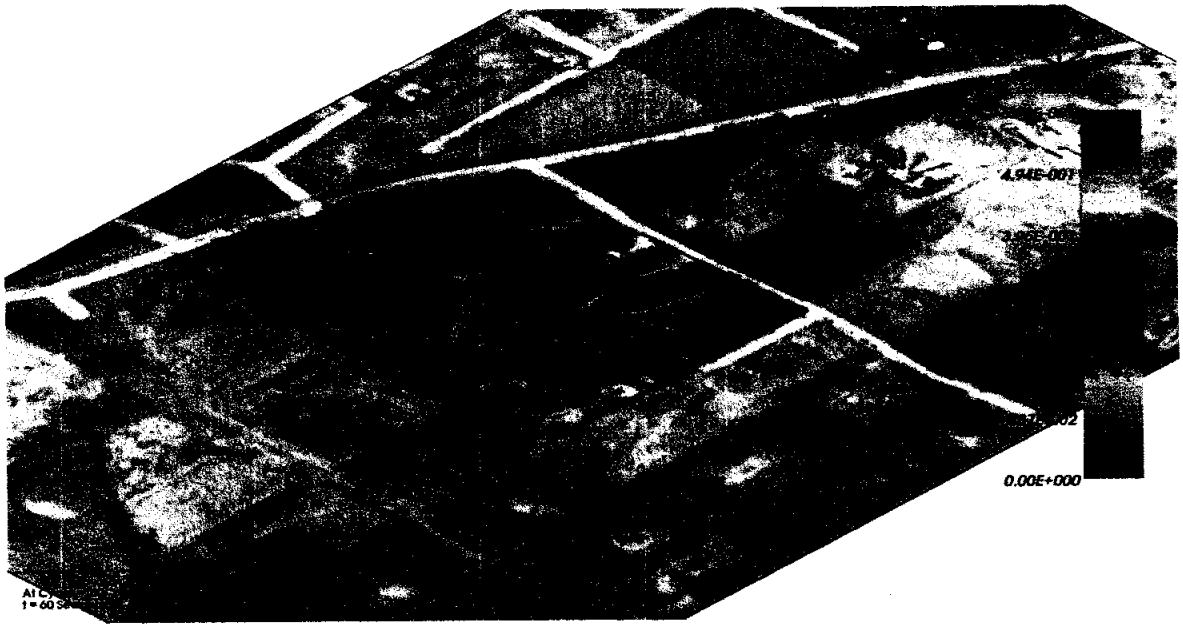


Source: CFD Software



Source: CFD Software

Fig.7.9: Release of Toluene at Times 60s (Wind Flow-5D)



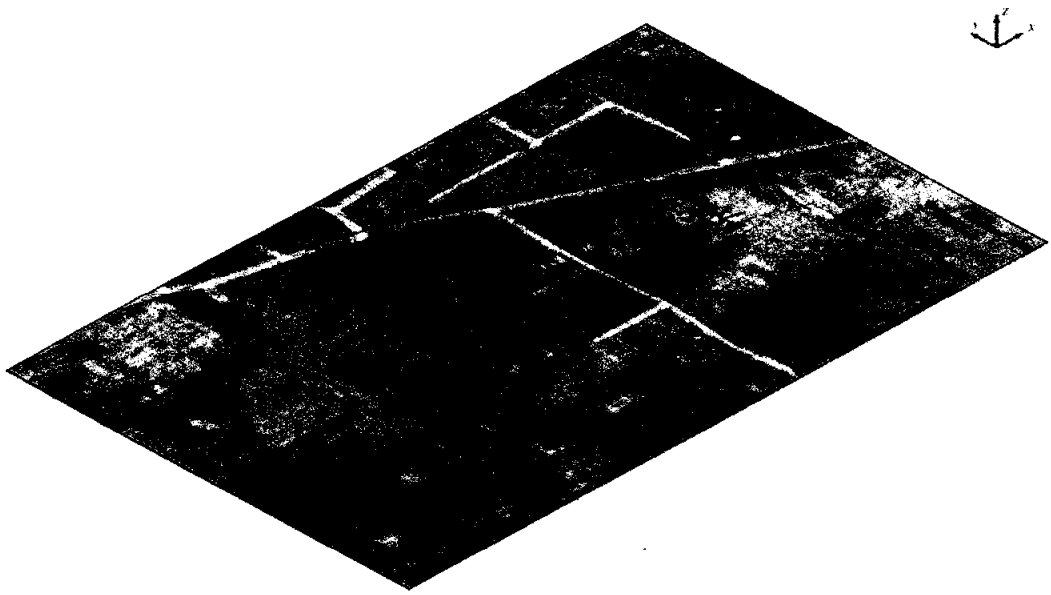
Source: CFD Software

Threshold Distances for Dispersion Scenario Modelled- Toluene

Material	Weather Scenario	Release Concentration (At 60s)	Distance
Toluene	**2F**	20 PPM	At source to 42.44 meters

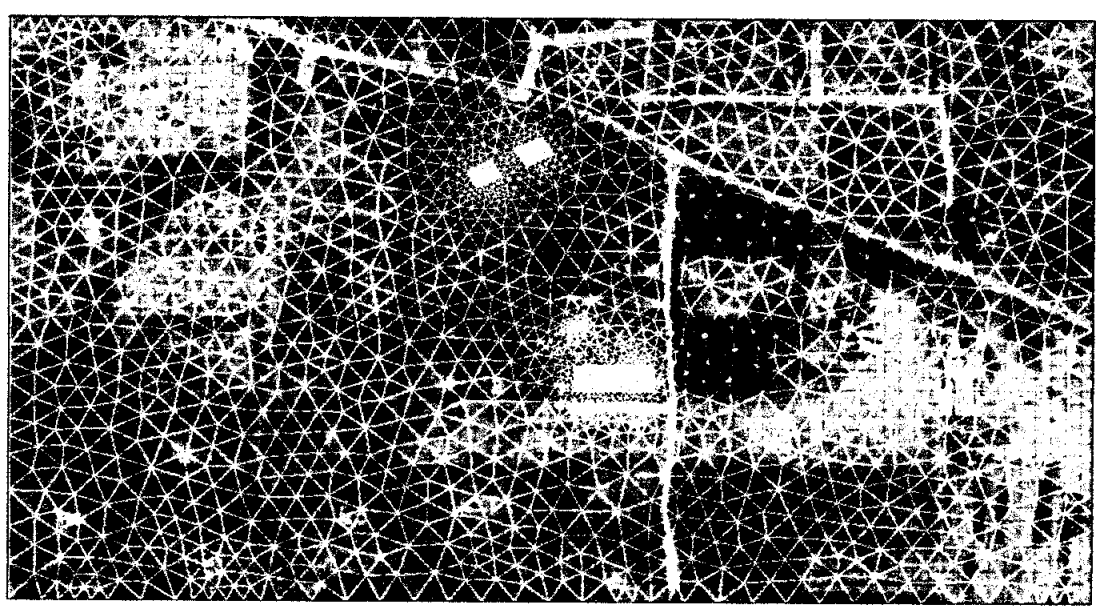
		20 to 500 PPM	42.44 to 54.49 meters
	5D	20 PPM	At source to 118.08 meters
		20 to 500 PPM	118.08 to 144.35 meters

Maximum Credible Accident - Release Scenario of Xylene



Source: CFD Software

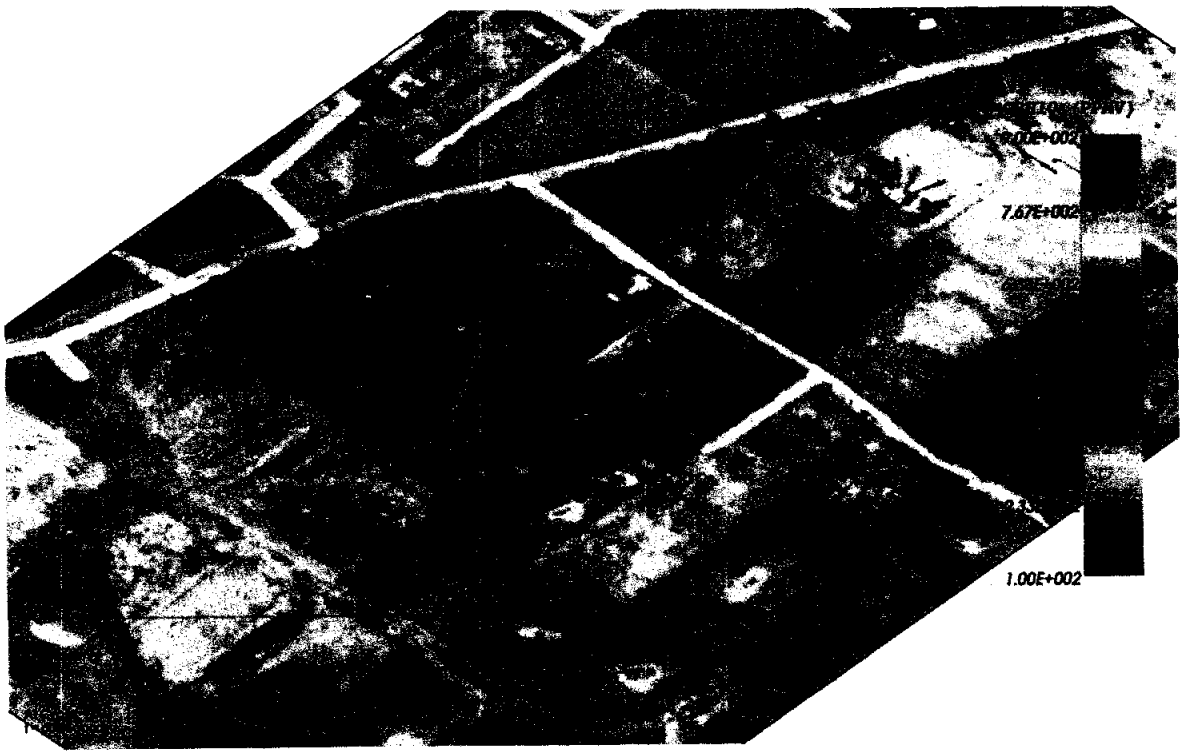
Fig.7.10: Topographical Model Setup as Digitized in Panache



Source: CFD Software

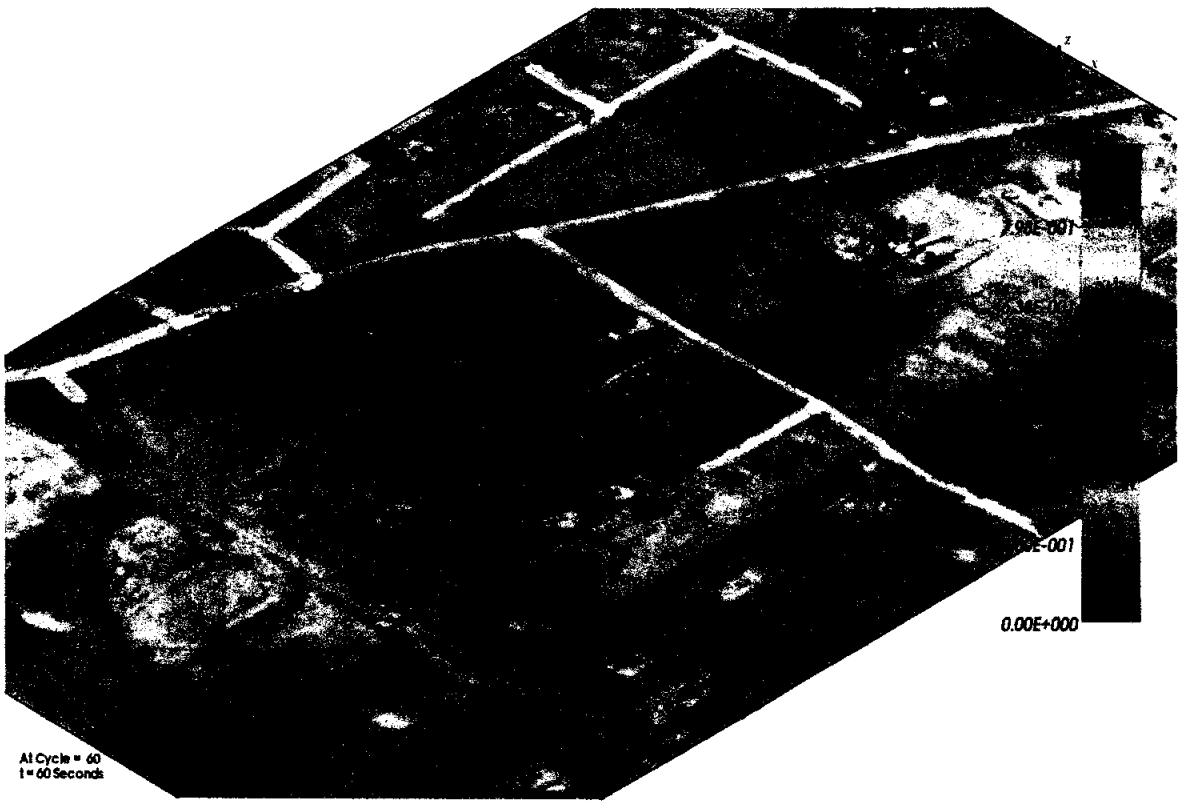
Fig.7.11: Mesh Considered for a Plant Site Simulation

Nature of Hazard	Name of Haz. Chemicals	Quantity Max. that can be stored	Place of storage	Operating Parameters	
Flammable	Xylene	50 KL	Tank	Under pressure	Ambient



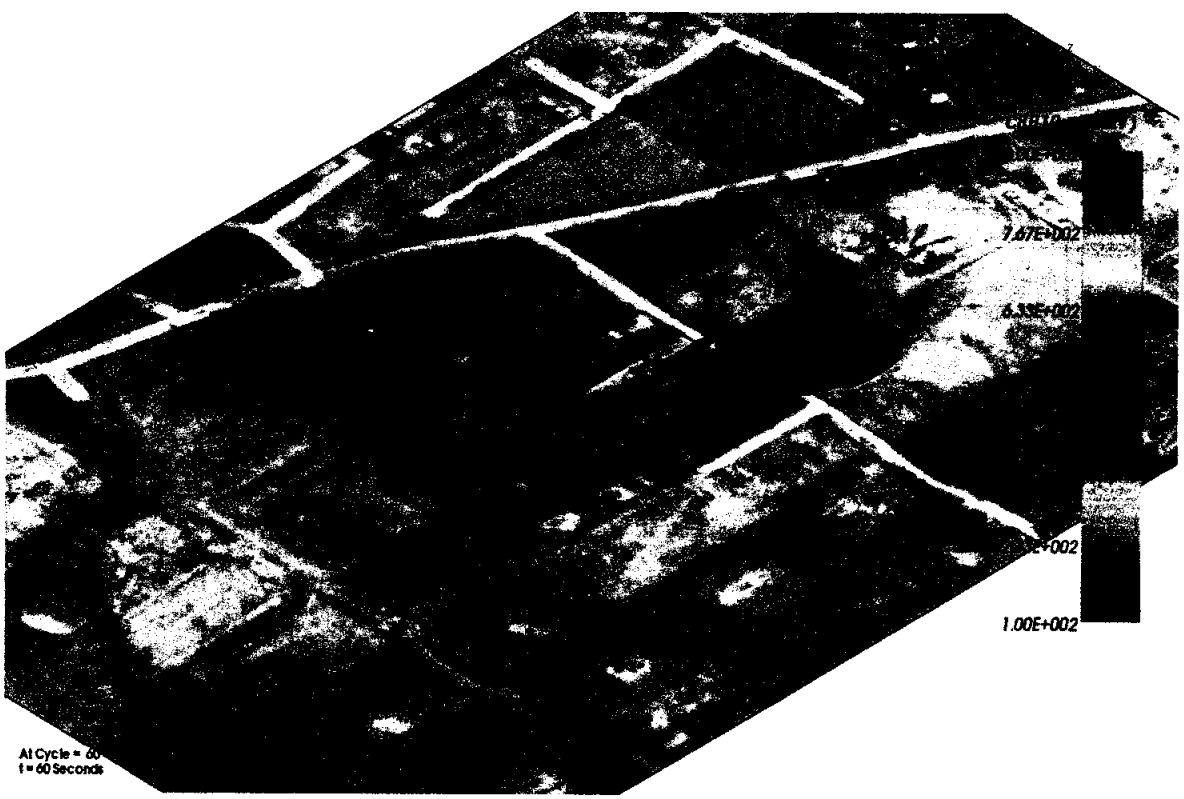
Source: CFD Software

Fig.7.12: Release of Xylene at Times 60s (Wind Flow-2F)

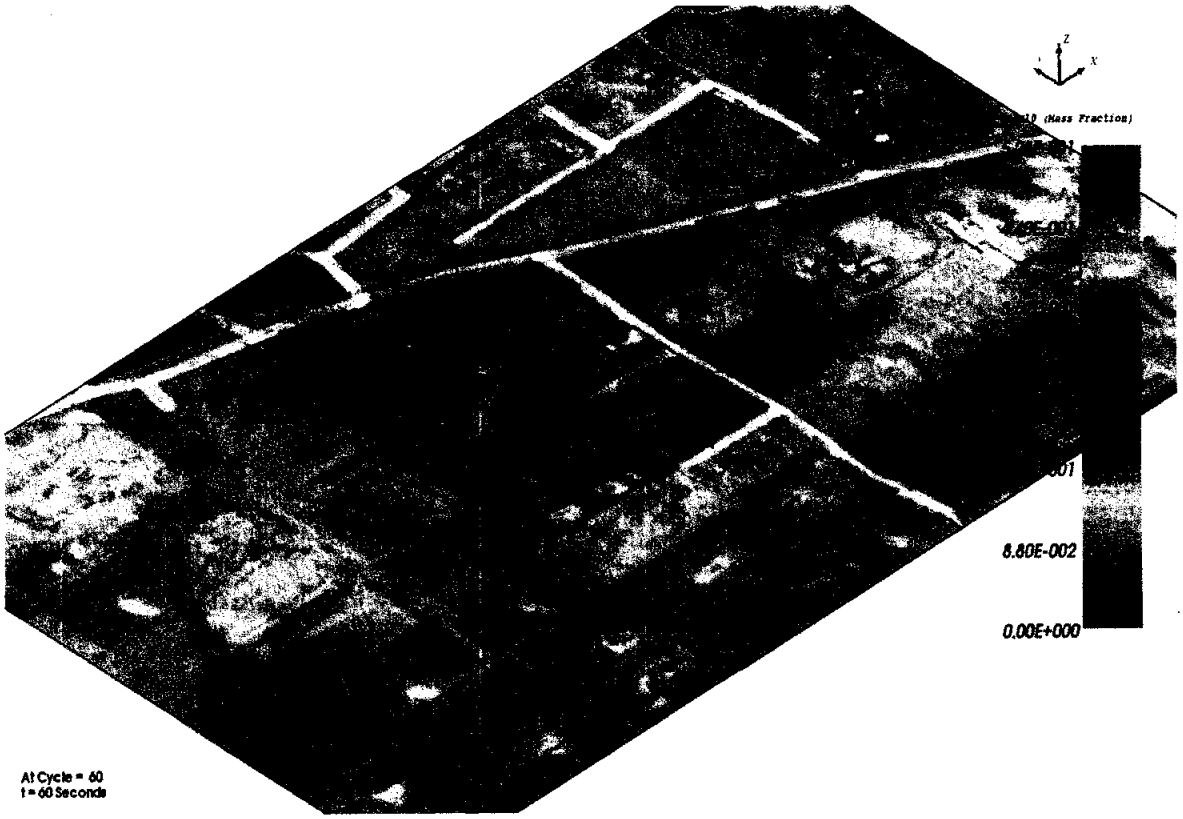


Source: CFD Software

Fig.7.13: Release of Xylene at Times 60s (Wind Flow-5D)



Source: CFD Software

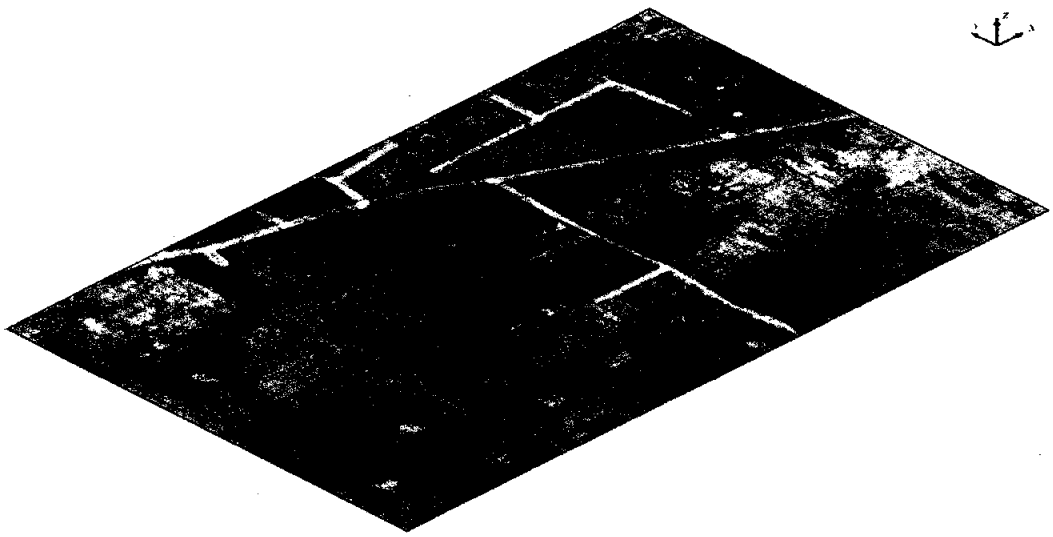


Source: CFD Software

Threshold Distances for Dispersion Scenario Modelled- Xylene

Material	Weather Scenario	Release Concentration (At 60s)	Distance
Xylene	2F	100 PPM	At source to 23.85 meters
		100 to 900 PPM	23.85 to 35.30 meters
	5D	100 PPM	At source to 112.85 meters
		100 to 900 PPM	112.85 to 142.43 meters

Maximum Credible Accident - Release Scenario of Turpentine Oil



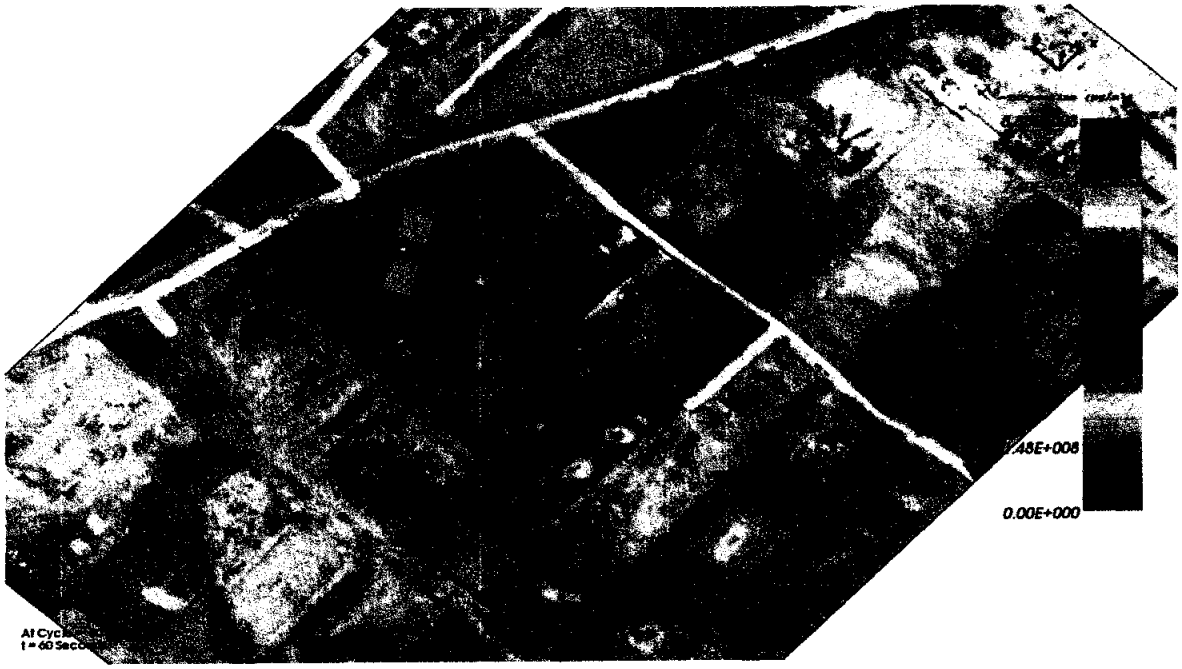
Source: CFD Software

Fig.7.14: Topographical Model Setup as Digitized in Panache

Source: CFD Software

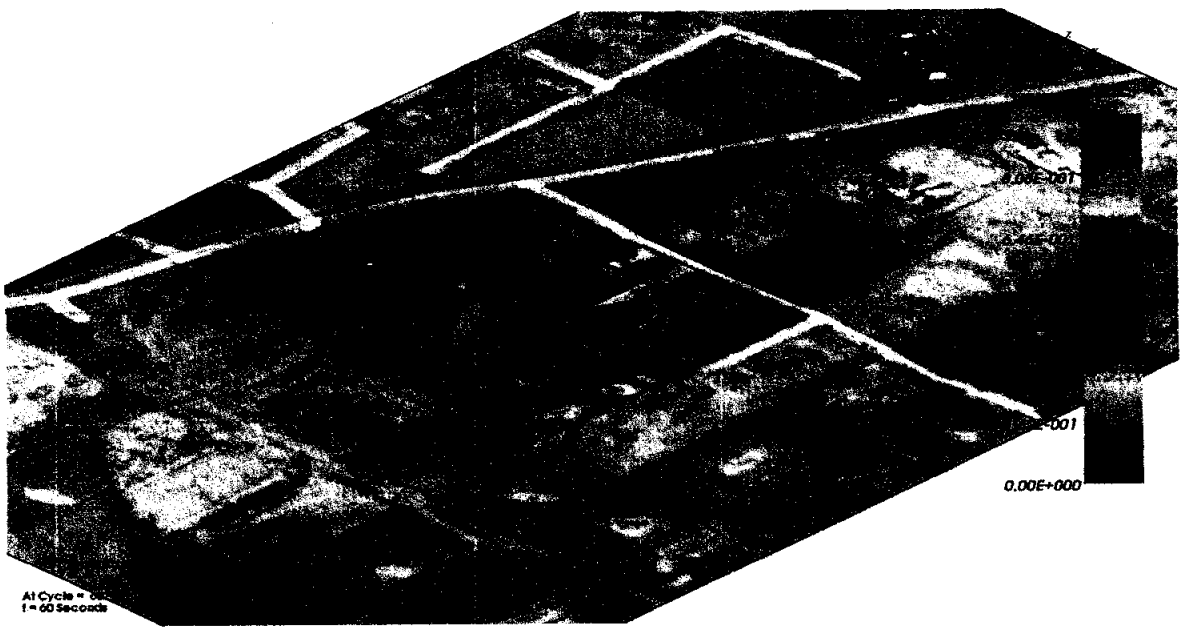
Fig.7.15: Mesh Considered for a Plant Site Simulation

Nature of Hazard	Name of Haz. Chemicals	Quantity Max. that can be stored	Place of storage	Operating Parameters	
Flammable	Turpentine oil	100 KL	Tank	Under pressure	Ambient



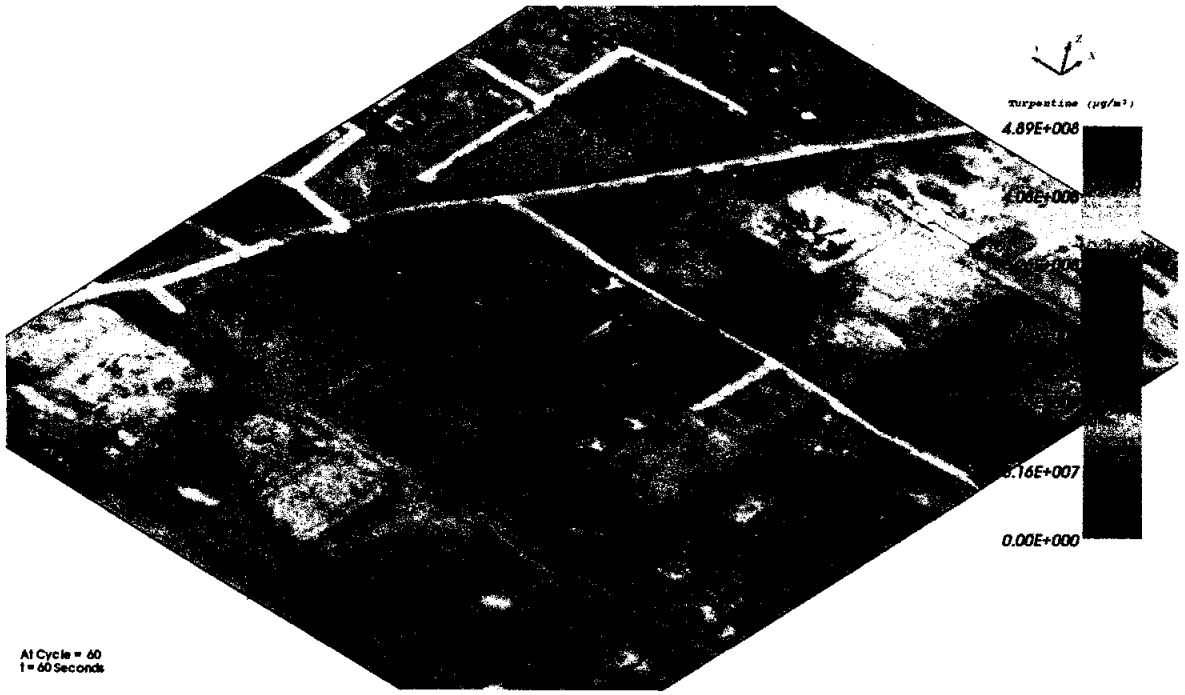
Source: Computational Fluid Dynamics (CFD) Software – 3D

Fig.7.16: Release of Turpentine Oil at Times 60s (Wind Flow-2F)

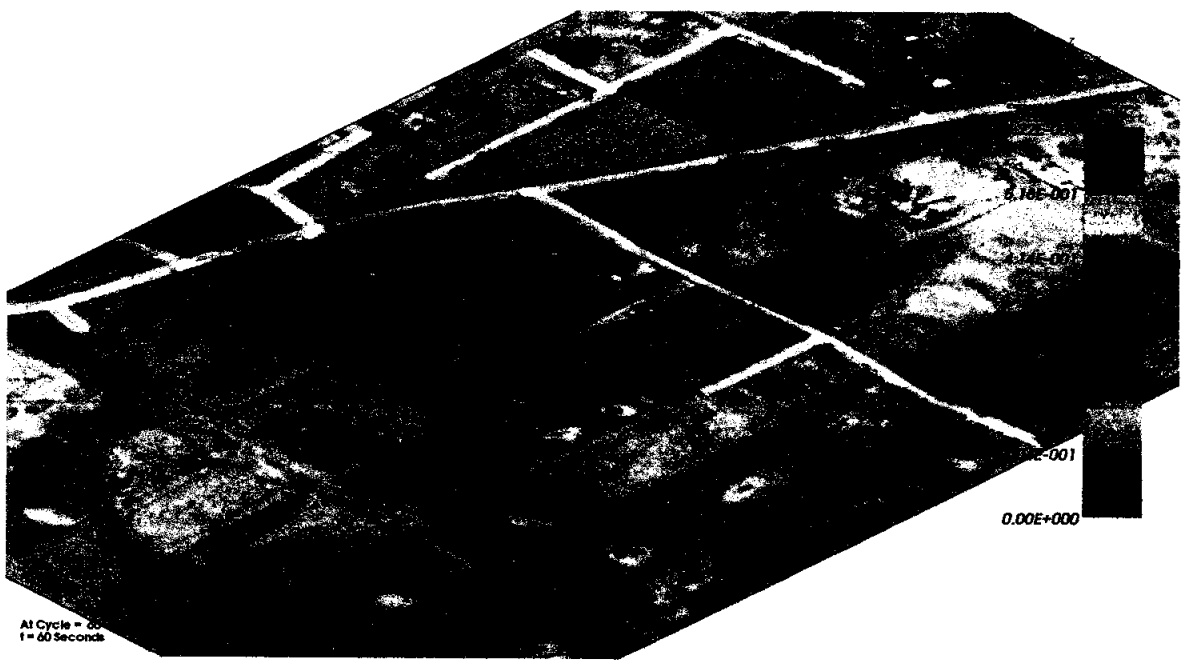


Source: CFD Software

Fig.7.17: Release of Turpentine Oil at Times 60s (Wind Flow-5D)



Source: CFD Software

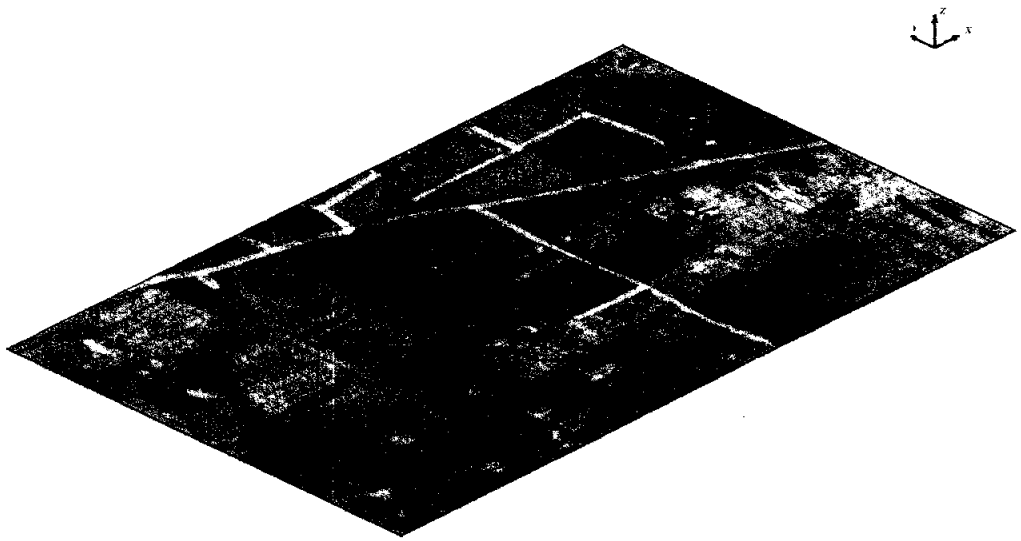


Source: CFD Software

Threshold Distances for Dispersion Scenario Modelled- Turpentine oil

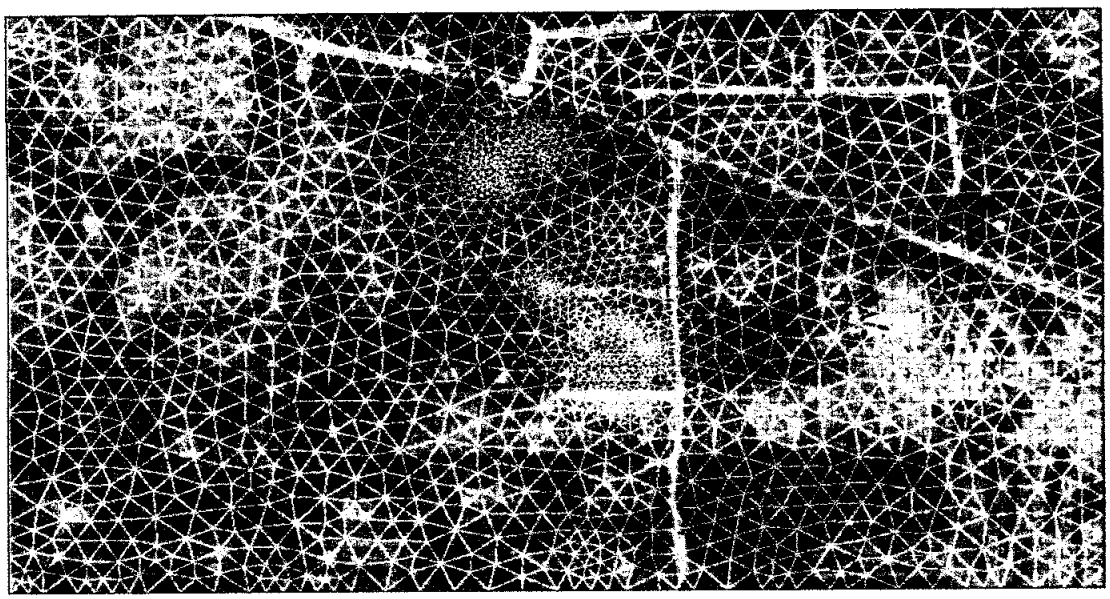
Material	Weather Scenario	Release Concentration (At 60s)	Distance
Turpentine oil	2F	0.1 PPM	At source to 6.34 meters
		0.1 to 0.8 PPM	6.34 to 39.41 meters
	5D	0.1 PPM	At source to 7.91 meters
		0.1 to 0.8 PPM	7.91 to 84.82 meters

Maximum Credible Accident - Release Scenario of Fuel Oil



Source: CFD Software

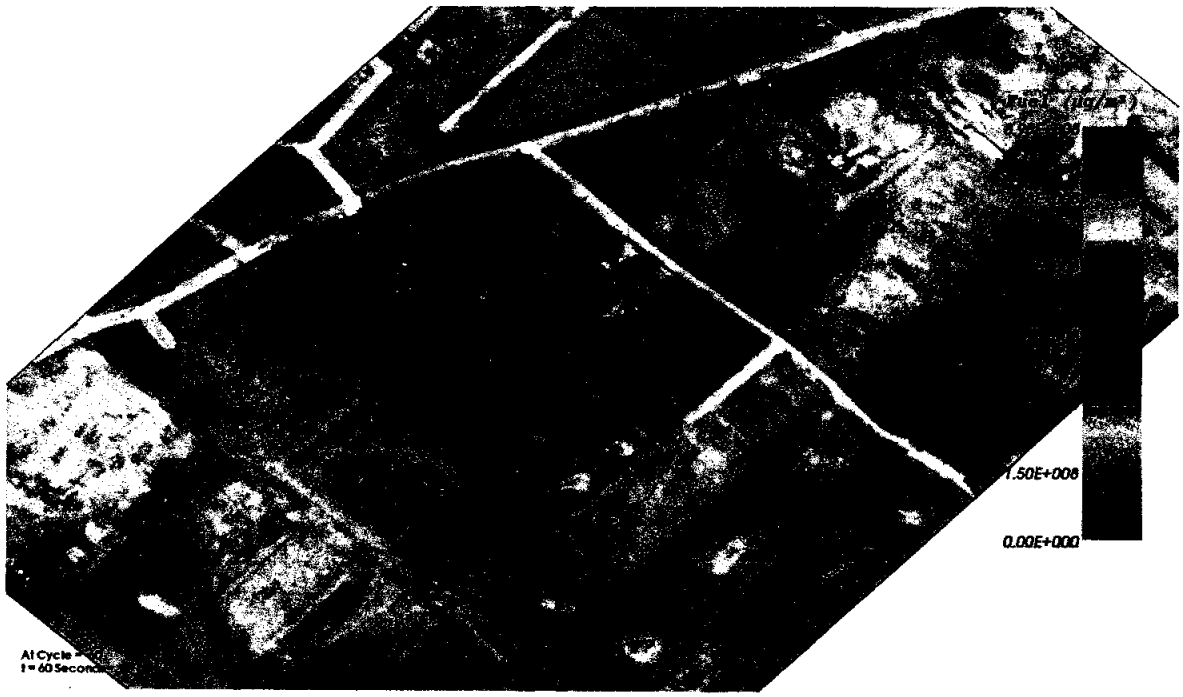
Fig.7.18: Topographical Model Setup as Digitized in Panache



Source: CFD Software

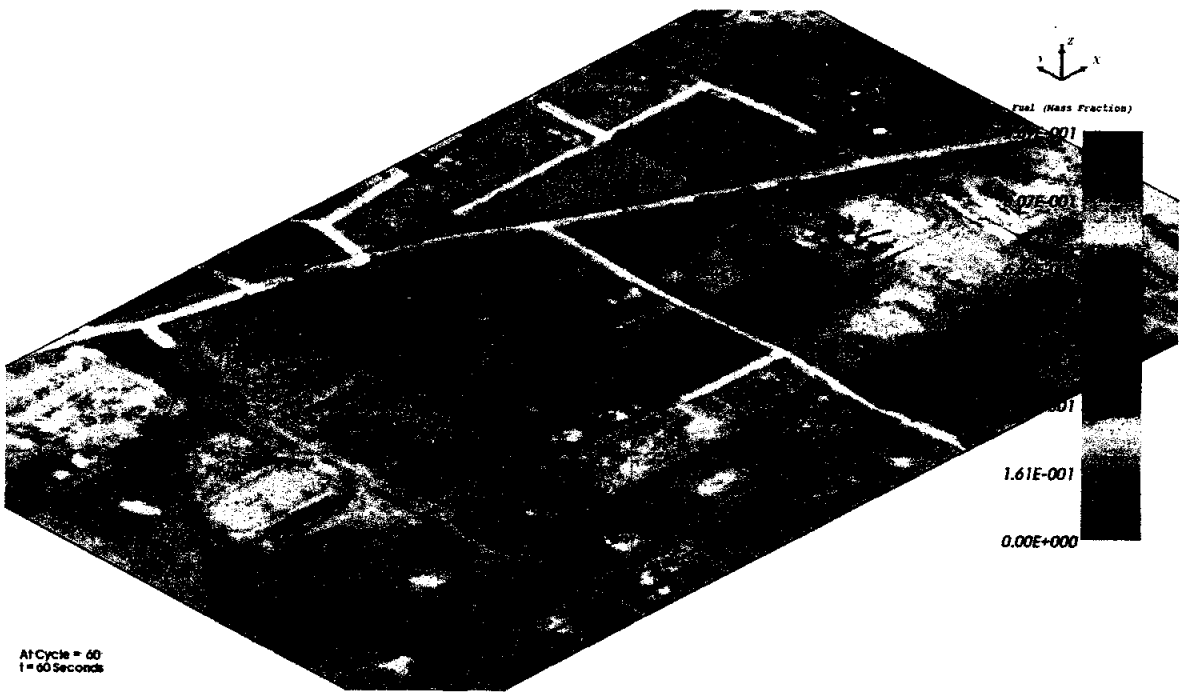
Fig.7.19: Mesh Considered for a Plant Site Simulation

Nature of Hazard	Name of Haz. Chemicals	Quantity Max. that can be stored	Place of storage	Operating Parameters	
Flammable	Fuel oil	100 KL	Tank	Under pressure	Ambient



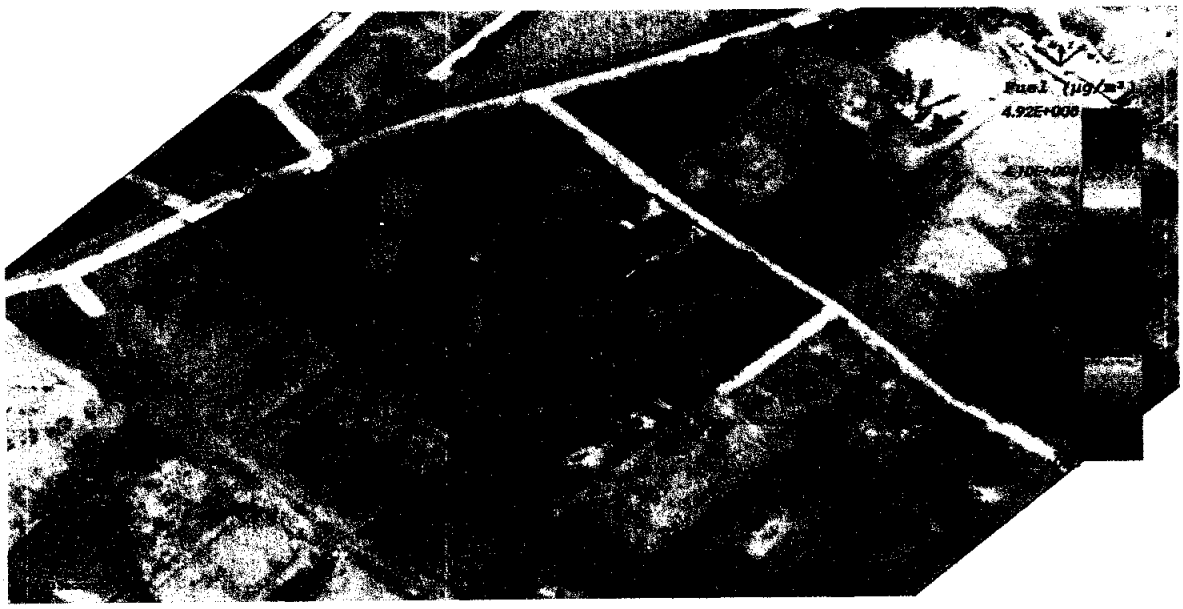
Source: CFD Software

Fig.7.20: Release of Fuel Oil at Times 60s (Wind Flow-2F)

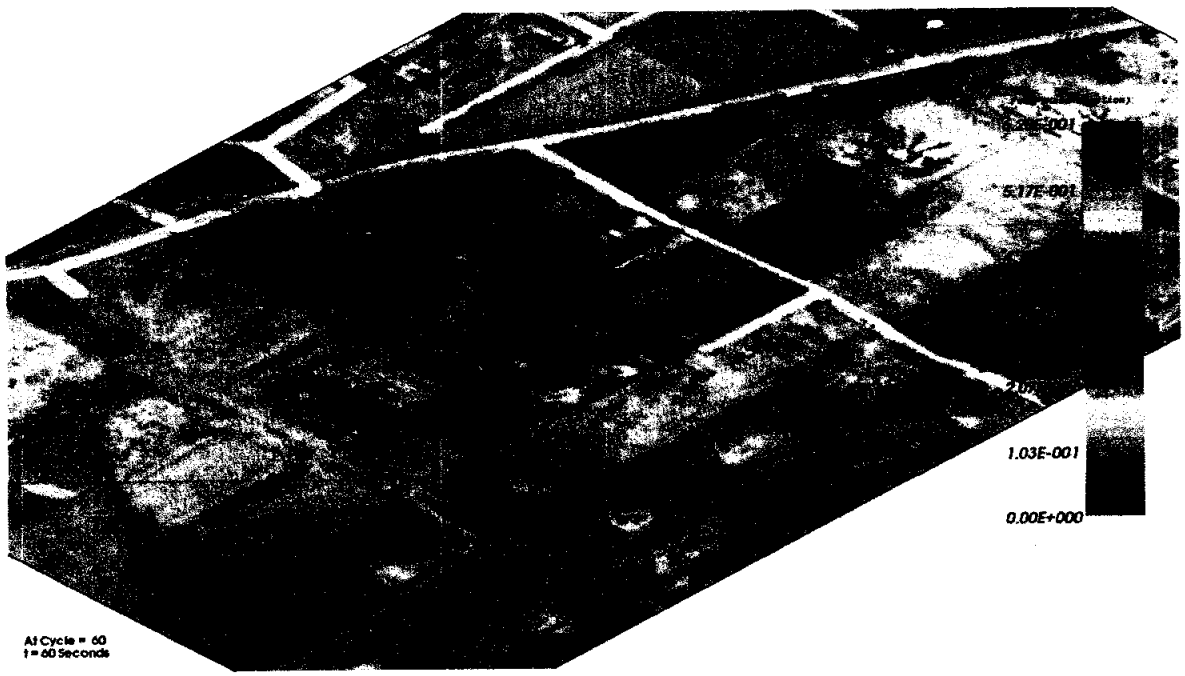


Source: CFD Software

Fig.7.21: Release of Fuel Oil at Times 60s (Wind Flow-5D)



Source: CFD Software

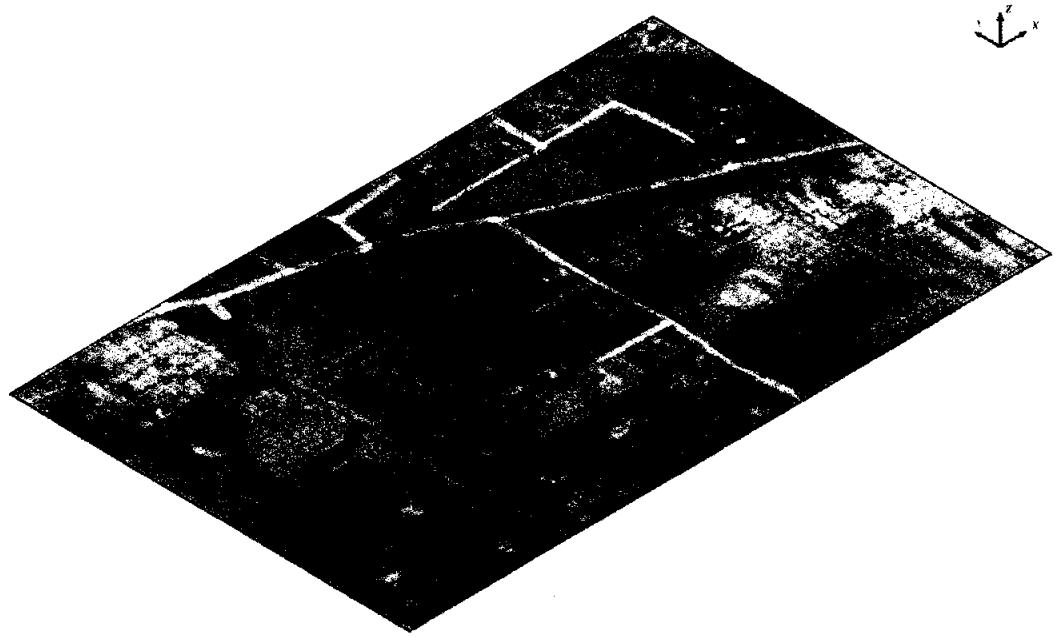


Source: CFD Software

Threshold Distances for Dispersion Scenario Modelled- Fuel oil

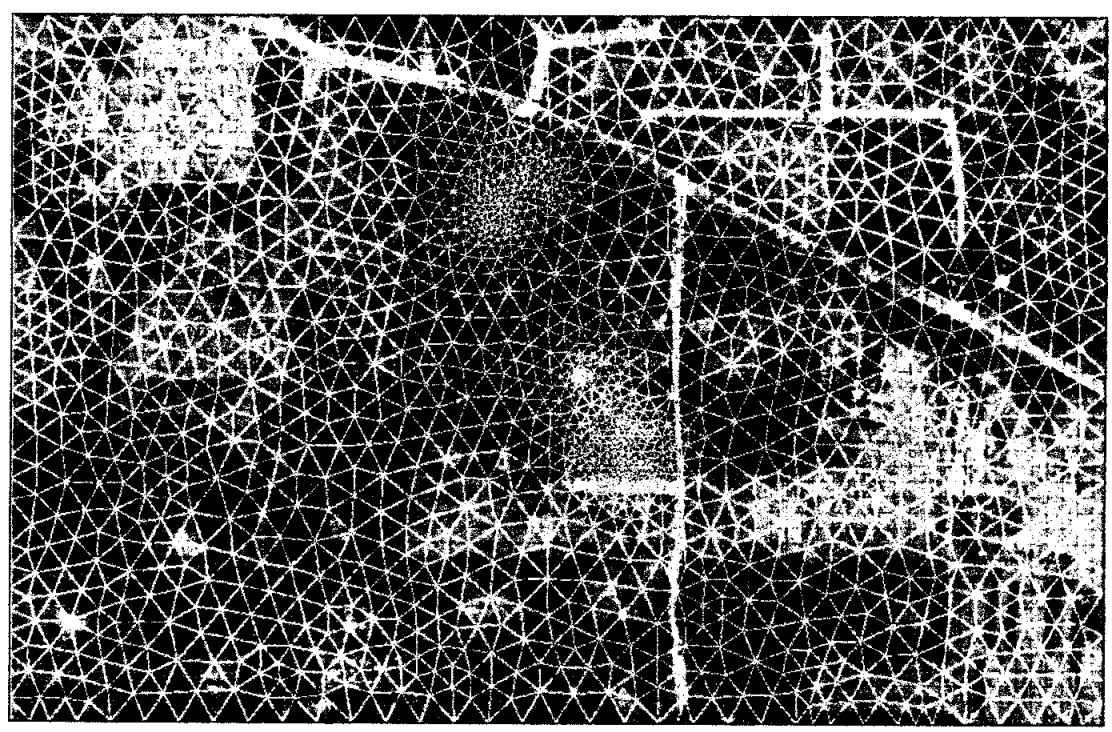
Material	Weather Scenario	Release Concentration (At 60s)	Distance
Fuel oil	2F	100 PPM	At source to 9.32 meters
		<100 PPM	9.32 to 57.35 meters
	5D	100 PPM	At source to 12.51 meters
		<100 PPM	12.51 to 140.00 meters

Maximum Credible Accident - Release Scenario of Aromatic Hydrocarbon of C-5 to C-9



Source: CFD Software

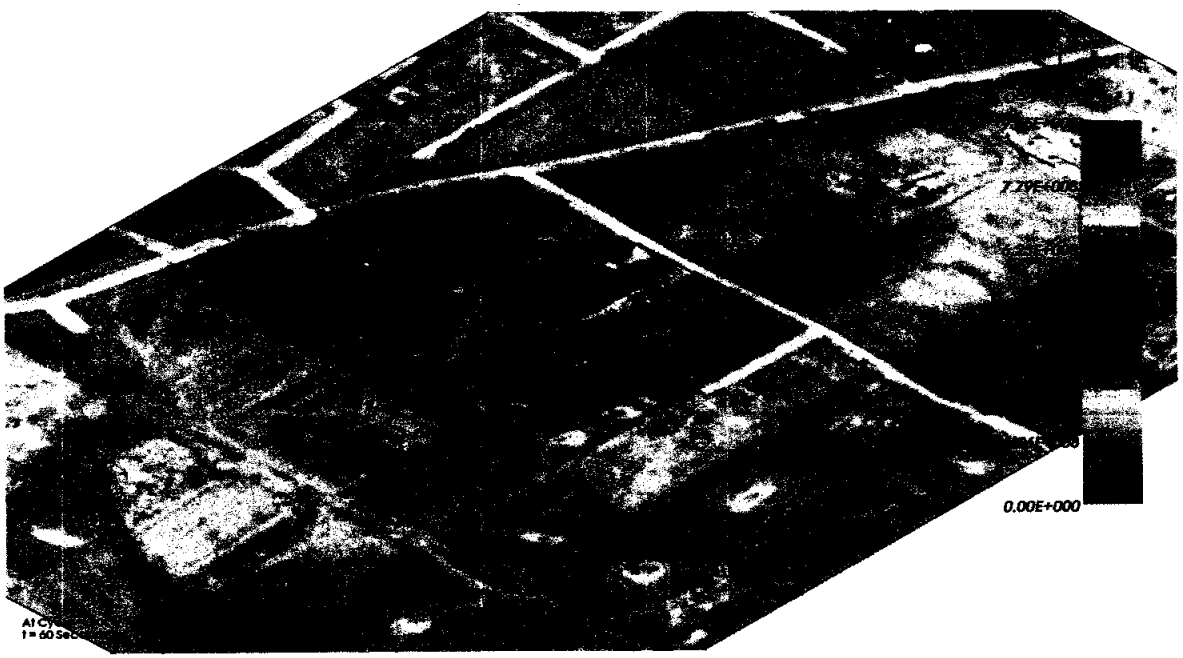
Fig.7.22: Topographical Model Setup as Digitized in Panache



Source: CFD Software

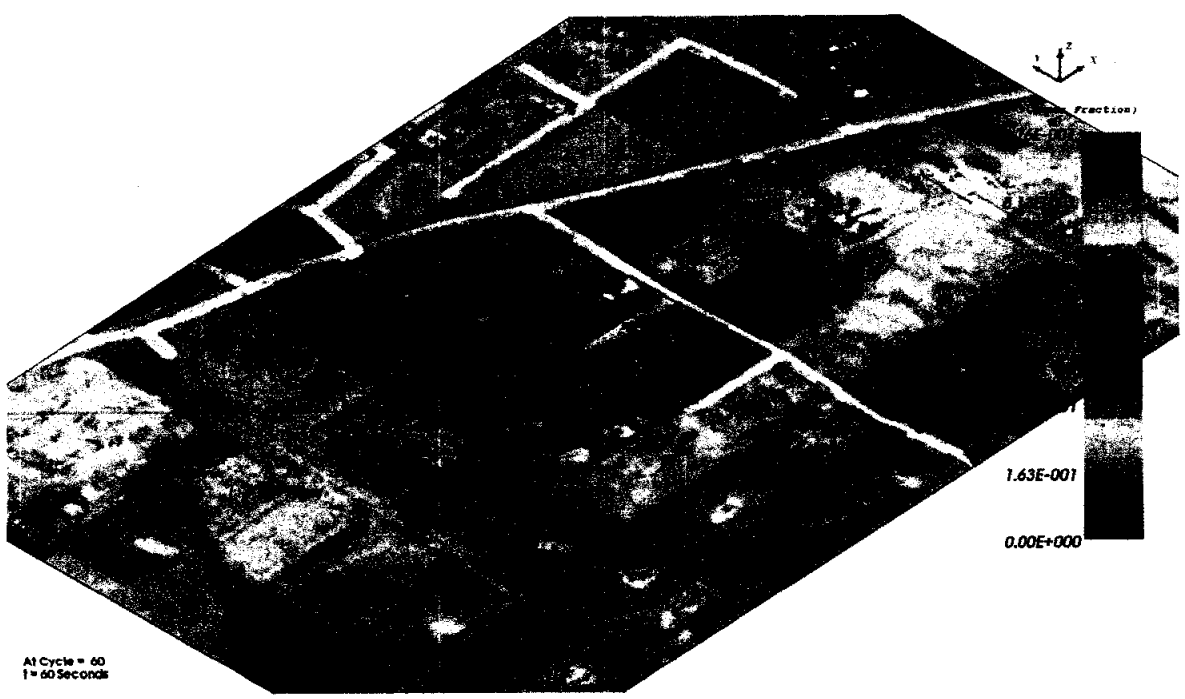
Fig.7.23: Mesh Considered for a Plant Site Simulation

Nature of Hazard	Name of Haz. Chemicals	Quantity Max. that can be stored	Place of storage	Operating Parameters	
Flammable	Aromatic Hydrocarbon of C-5 to C-9	70 KL	Tank	Under pressure	Ambient

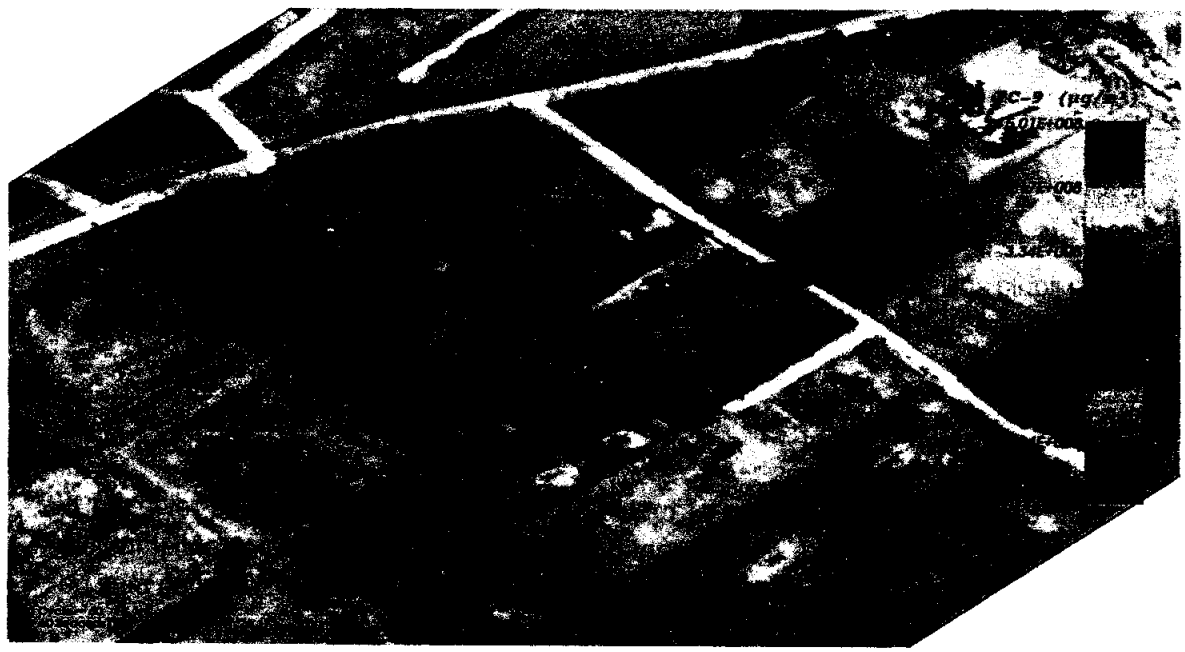


Source: CFD Software

Fig.7.24: Release of Aromatic Hydrocarbon of C-5 to C-9 at Times 60s (Wind Flow-2F)

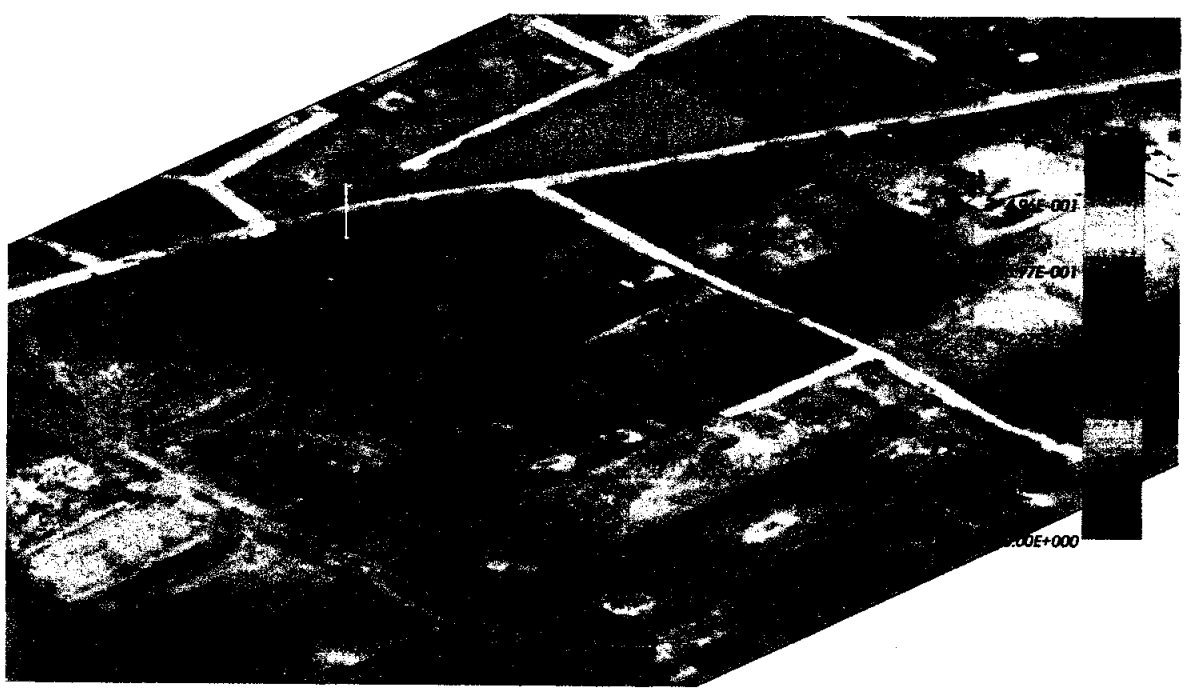


Source: CFD Software



Source: CFD Software

Fig.7.25: Release of Aromatic Hydrocarbon of C-5 to C-9 at Times 60s (Wind Flow-5D)



Source: CFD Software

Threshold Distances for Dispersion Scenario Modelled- Aromatic Hydrocarbon of C-5 to C-9

Material	Weather Scenario	Release Concentration (At 60s)	Distance
	2F	100 PPM	At source to 6.84 meters
		<100 PPM	6.84 to 37.84 meters

Aromatic Hydrocarbon of C-5 to C-9	**5D**	100 PPM	At source to 12.54 meters
		<100 PPM	12.54 to 83.33 meters

Maximum Credible Accident of Tank Storage area

When a non-boiling liquid spills, it spreads into a pool. The size of the pool depends on the availability of the bund and obstacles. If there are no obstacles or bund, it can spread into a thin film on flat land/floor.

Depending upon the conditions, there are several ways in which these can occur, ultimately causing damage due to heat radiation.

Pool fire may result when bulk storage tanks of fuel will leak/burst, and the material released is ignited. If the tanks are provided with dike walls to contain the leak and avoid spreading of flammable material, the pool fire will be confined to the dike area only. However, the effects of radiation may be felt to larger area depending upon the size of the pool and quantity of material involved. Thermal radiation due to pool fire may cause various degrees of burns on human bodies. Moreover, their effects on objects like piping, equipment are severe depending upon the radiant heat intensity.

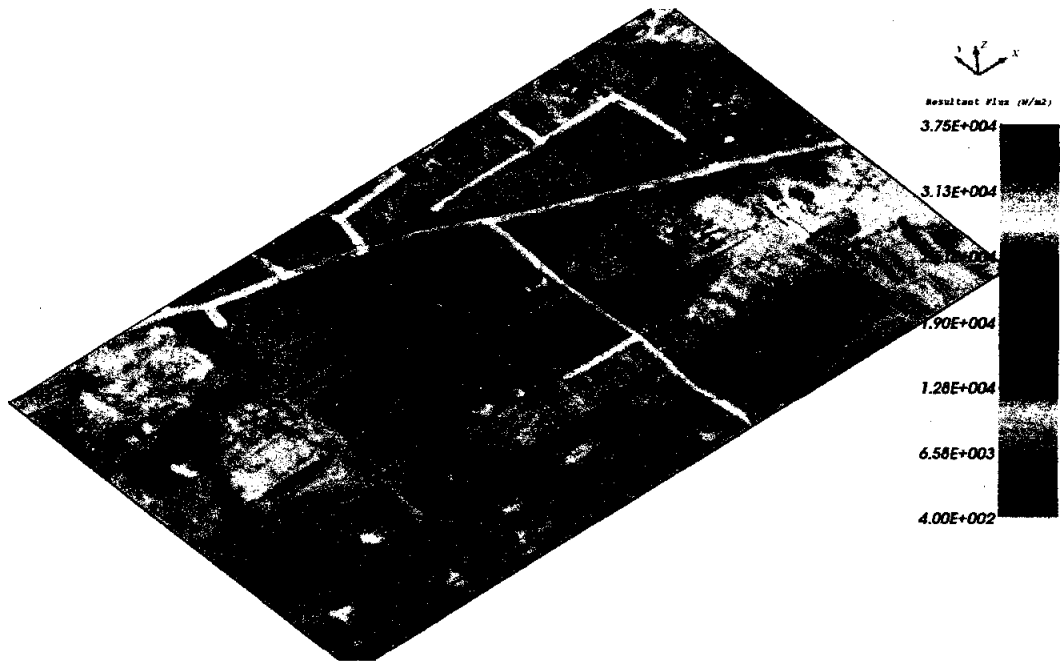
Sr. No	Maximum Credible Scenario	Type of Scenario	Name of Haz. Chemicals	Quantity Max. that can be stored	Place of storage	Operating Parameters	
						Press Kgs / cm2	Temp
1.	MCS – 1	Toxic	Acetone	70 KL X 1 Nos.	Tank Farm Area	Atmospheric	Ambient
2.	MCS – 2	Toxic	Toluene	70 KL X 1 Nos.	Tank Farm Area	Atmospheric	Ambient
3.	MCS – 3	Toxic	Xylene	50 KL X 1 Nos. 40 KL X 1 Nos.	Tank Farm Area	Atmospheric	Ambient
4.	MCS – 4	Toxic	LDO	100 KL X 1 Nos. 70 KL X 1 Nos.	Tank Farm Area	Atmospheric	Ambient

Scenario of Acetone

Assumption: A hypothetical scenario is considered- Acetone Tank (100 % filled with 70KL) was stored in open yard. Assuming whole tank get ruptured. Wind flow velocity in the area is 3.36 m/s from the South West to (constant profile).Weather temperature is 25 °C (a normal day condition).

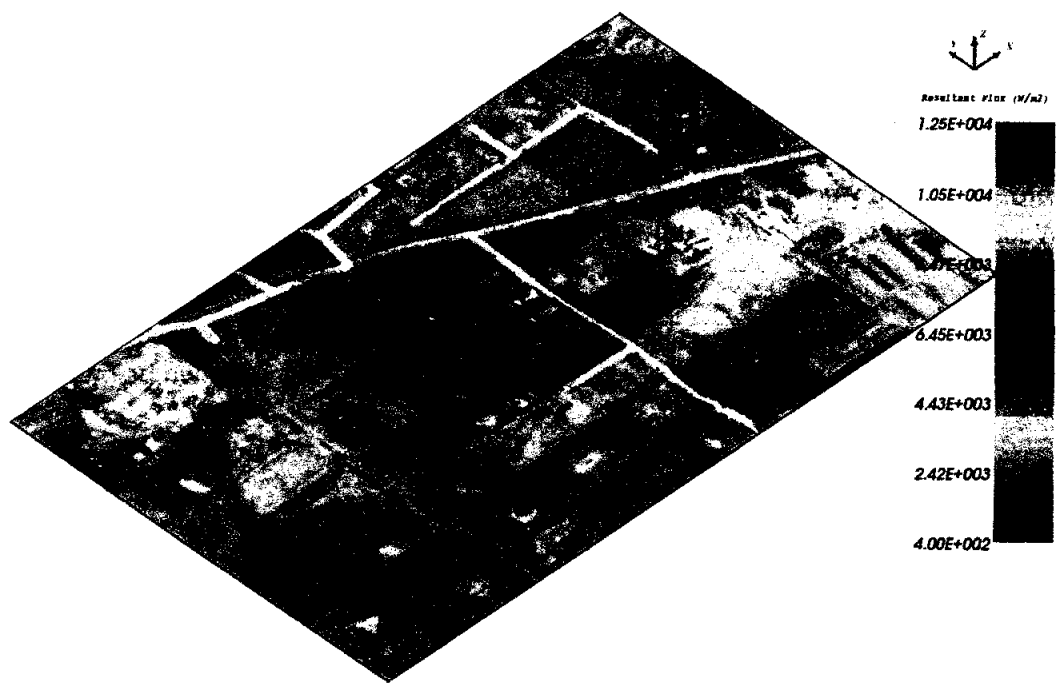
Acetone Pool Fire

The entire liquid inventory gets released resulting in pool formation, subsequent evaporation and got spark & late pool fire happened. Heat Intensity Radiation of different level is shown below...



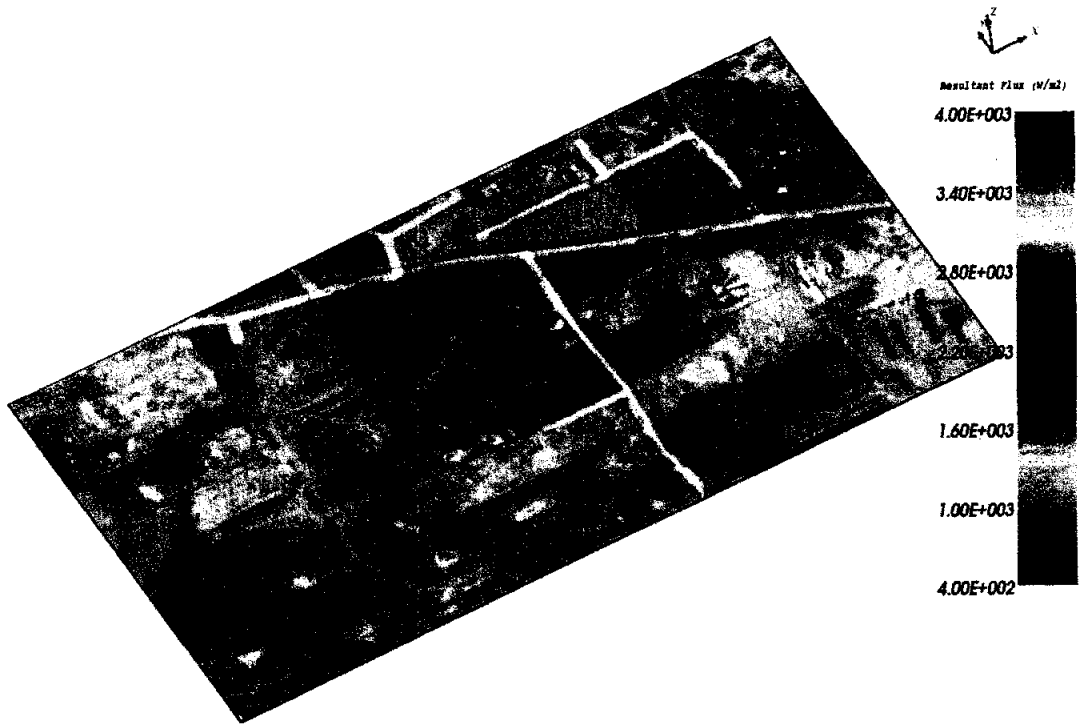
Source: Fire Radiation Evaluation Software

Fig.7.26: Impact Area of 37.5 Kw/M² Heat Radiation-For Acetone



Source: Fire Radiation Evaluation Software

Fig.7.27: Impact Area Of 12.5 Kw/M² Heat Radiation-For Acetone



Source: Fire Radiation Evaluation Software

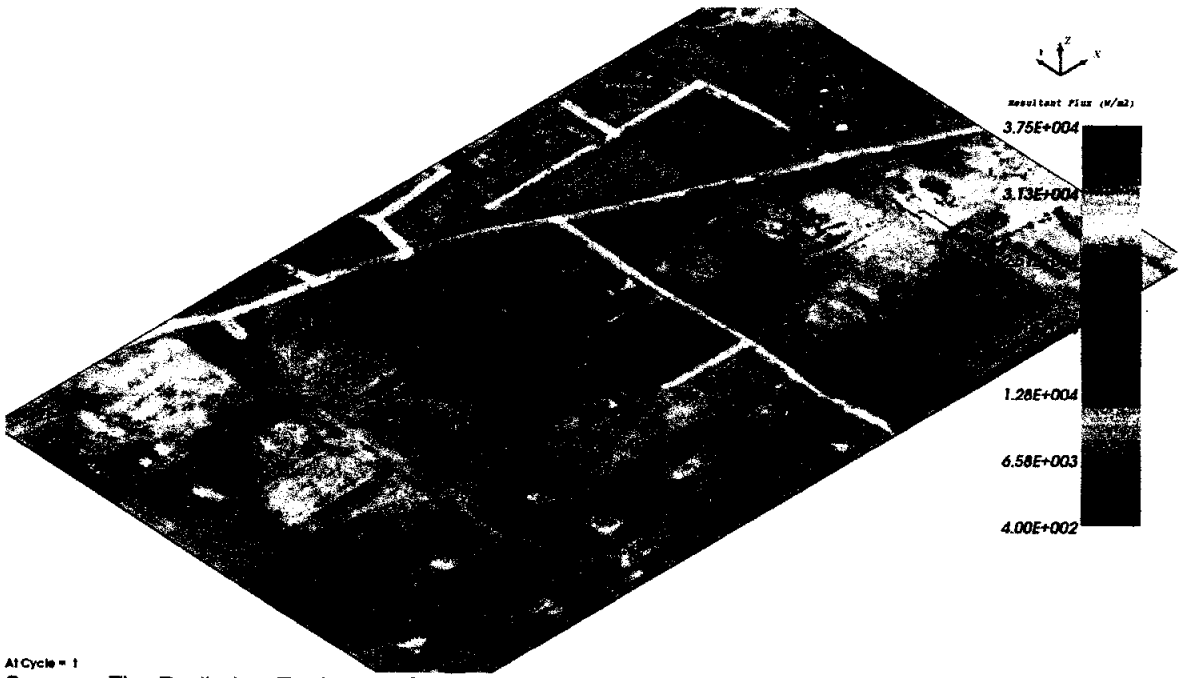
Fig.7.28: Impact Area of 4.0 Kw/M² Heat Radiation-For Acetone

1. Scenario of Toluene

Assumption: A hypothetical scenario is considered- Toluene Tank (100 % filled with 70KL) was stored in open yard. Assuming whole tank get ruptured. Wind flow velocity in the area is 3.36 $m.s^{-1}$ from the South West to (constant profile).Weather temperature is 25 °C (a normal day condition).

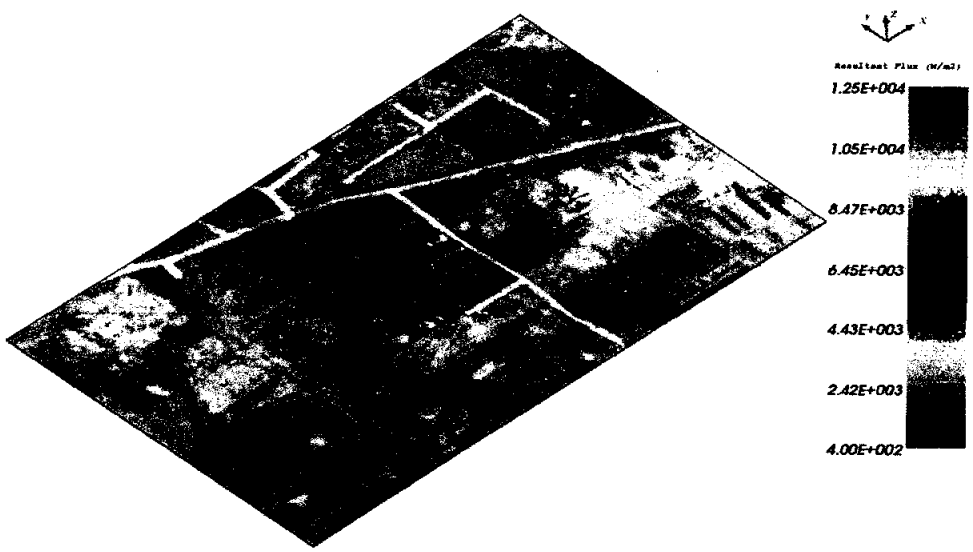
Toluene Pool Fire

The entire liquid inventory gets released resulting in pool formation, subsequent evaporation and got spark & late pool fire happened. Heat Intensity Radiation of different level is shown below...



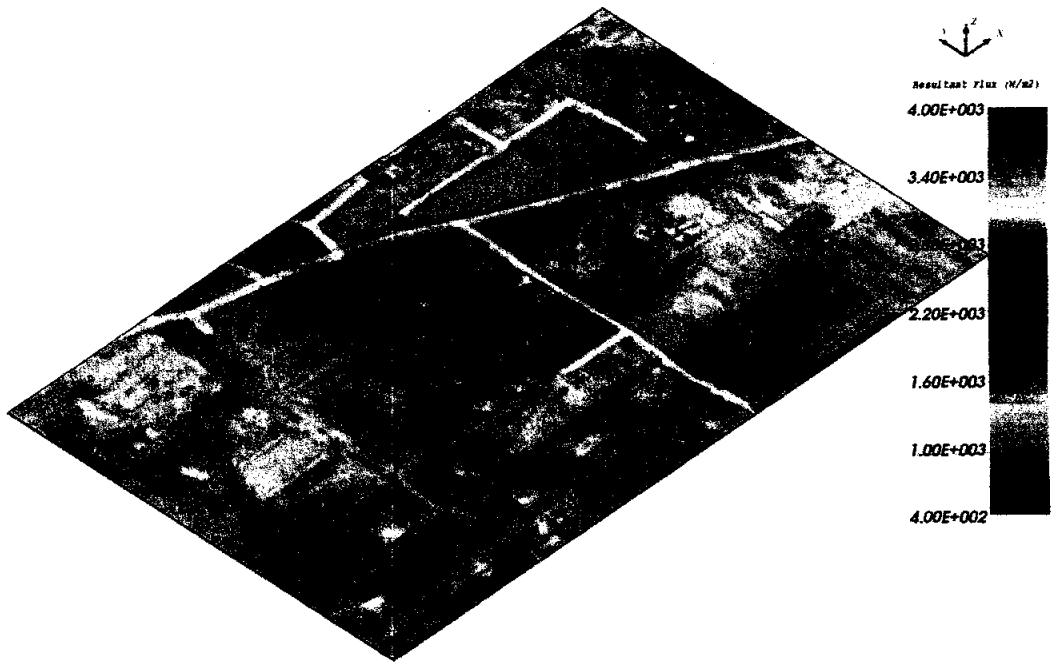
Source: Fire Radiation Evaluation Software

Fig.7.29: Impact Area Of 37.5 Kw/m² Heat Radiation-For Toluene



Source: Fire Radiation Evaluation Software

Fig.7.30: Impact Area of 12.5 Kw/M² Heat Radiation-For Toluene



Source: Fire Radiation Evaluation Software

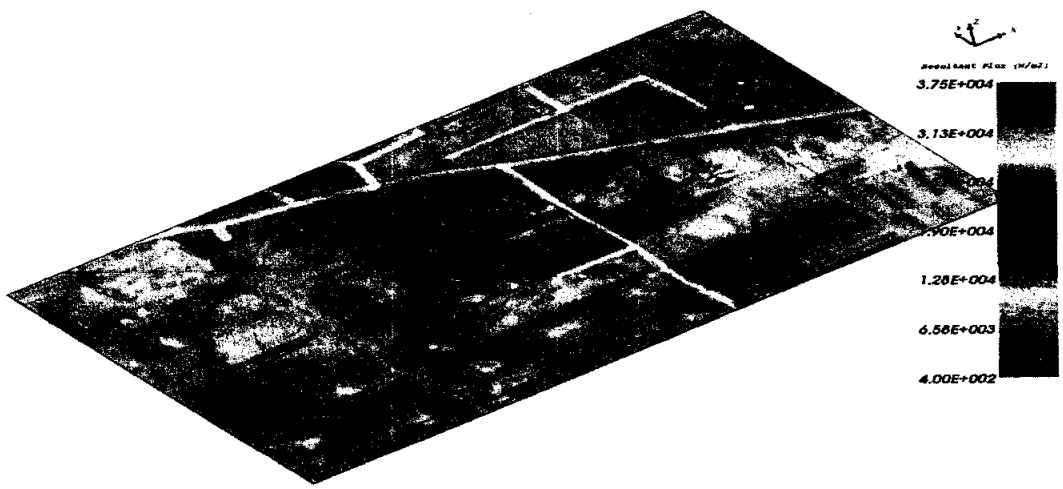
Fig.7.31: Impact Area of 4.0 Kw/m² Heat Radiation-For Toluene

2. Scenario of Xylene

Assumption: A hypothetical scenario is considered- Xylene Tank (100 % filled with 50KL) was stored in open yard. Assuming whole tank get ruptured. Wind flow velocity in the area is 3.36 $m.s^{-1}$ from the South West to (constant profile).Weather temperature is 25 °C (a normal day condition).

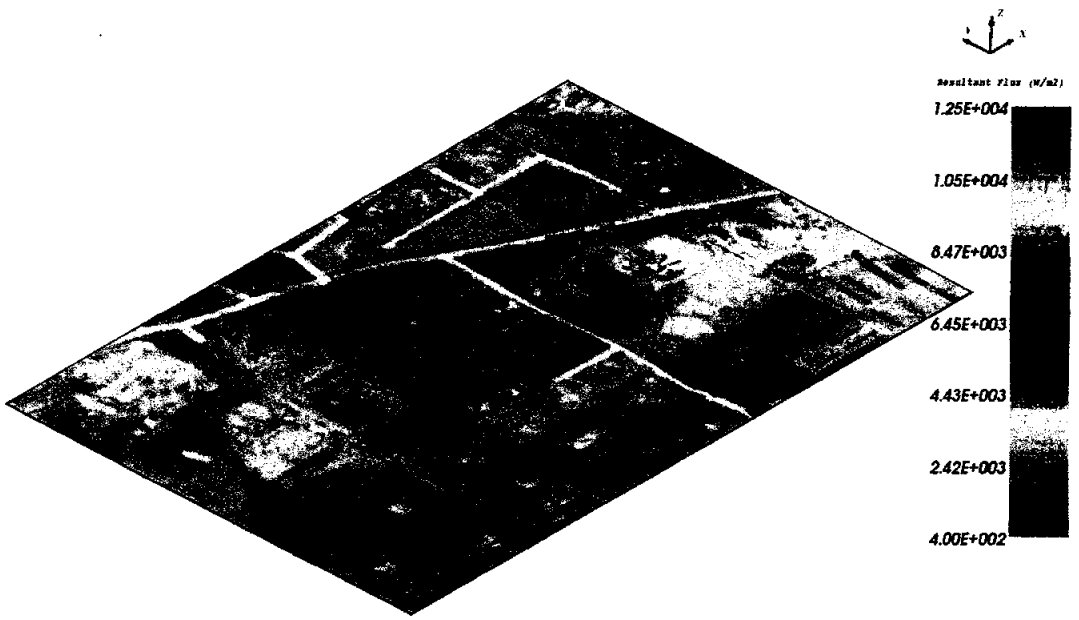
Xylene Pool Fire

The entire liquid inventory gets released resulting in pool formation, subsequent evaporation and got spark & late pool fire happened. Heat Intensity Radiation of different level is shown below...



Source: Fire Radiation Evaluation Software

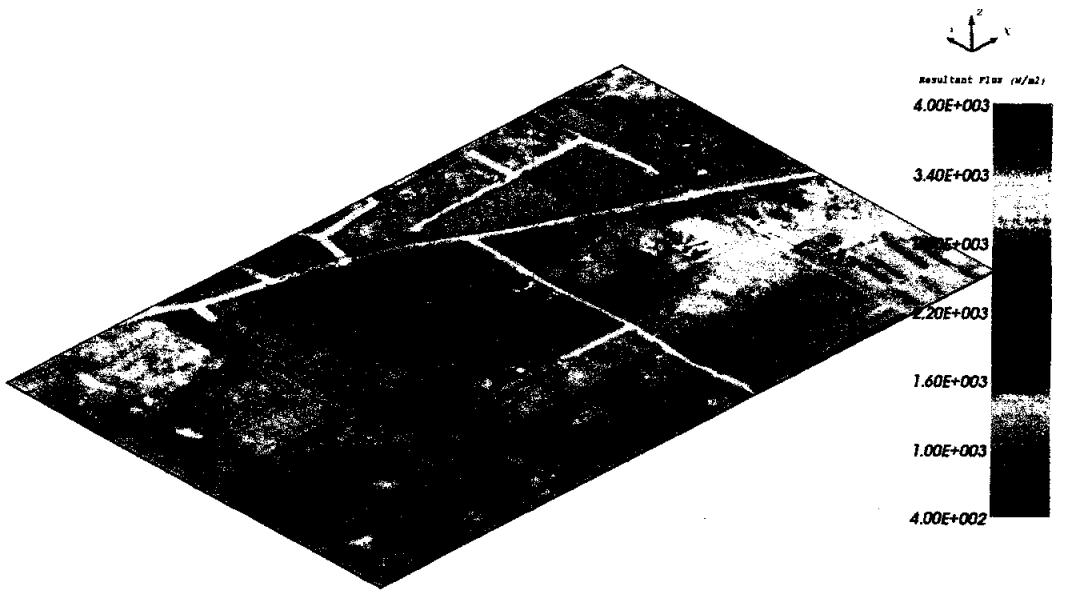
Fig.7.32 Impact Area Of 37.5 Kw/m² Heat Radiation-For Xylene



At Cycle = 0

Source: Fire Radiation Evaluation Software

Fig.7.33: Impact Area of 12.5 Kw/M² Heat Radiation-For Xylene



At Cycle = 0

Source: Fire Radiation Evaluation Software

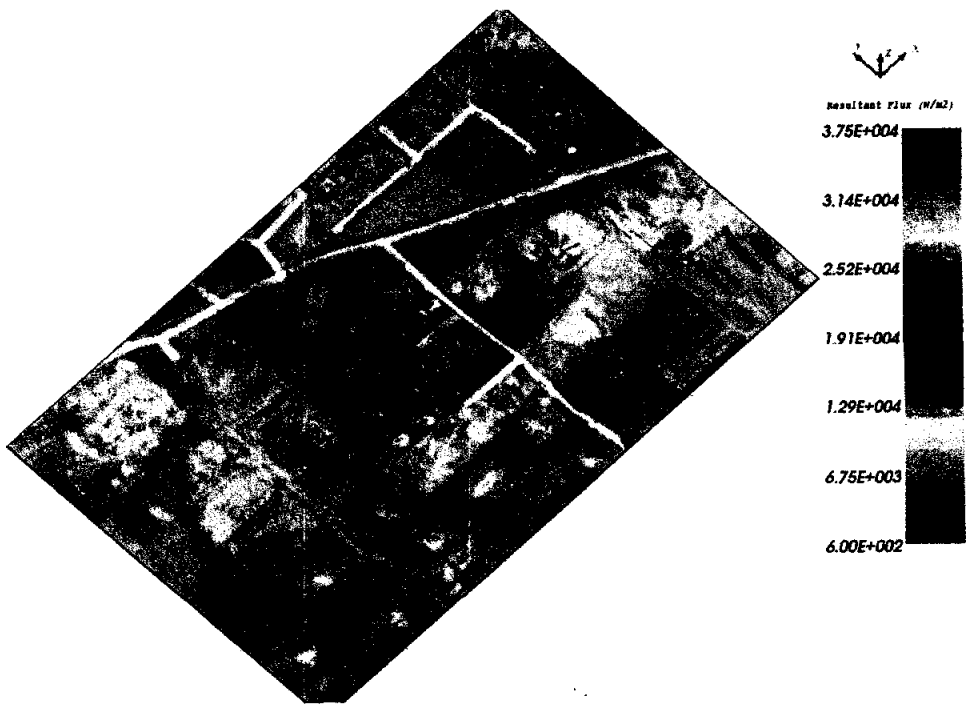
Fig.7.34: Impact Area of 4.0 Kw/M² Heat Radiation-For Xylene

3. Scenario of LDO

Assumption: A hypothetical scenario is considered- LDO Tank (100 % filled with 100KL) was stored in open yard. Assuming whole tank get ruptured. Wind flow velocity in the area is 3.36 $m.s^{-1}$ from the South West to (constant profile).Weather temperature is 25 °C (a normal day condition).

LDO Pool Fire

The entire liquid inventory gets released resulting in pool formation, subsequent evaporation and got spark & late pool fire happened. Heat Intensity Radiation of different level is shown below...

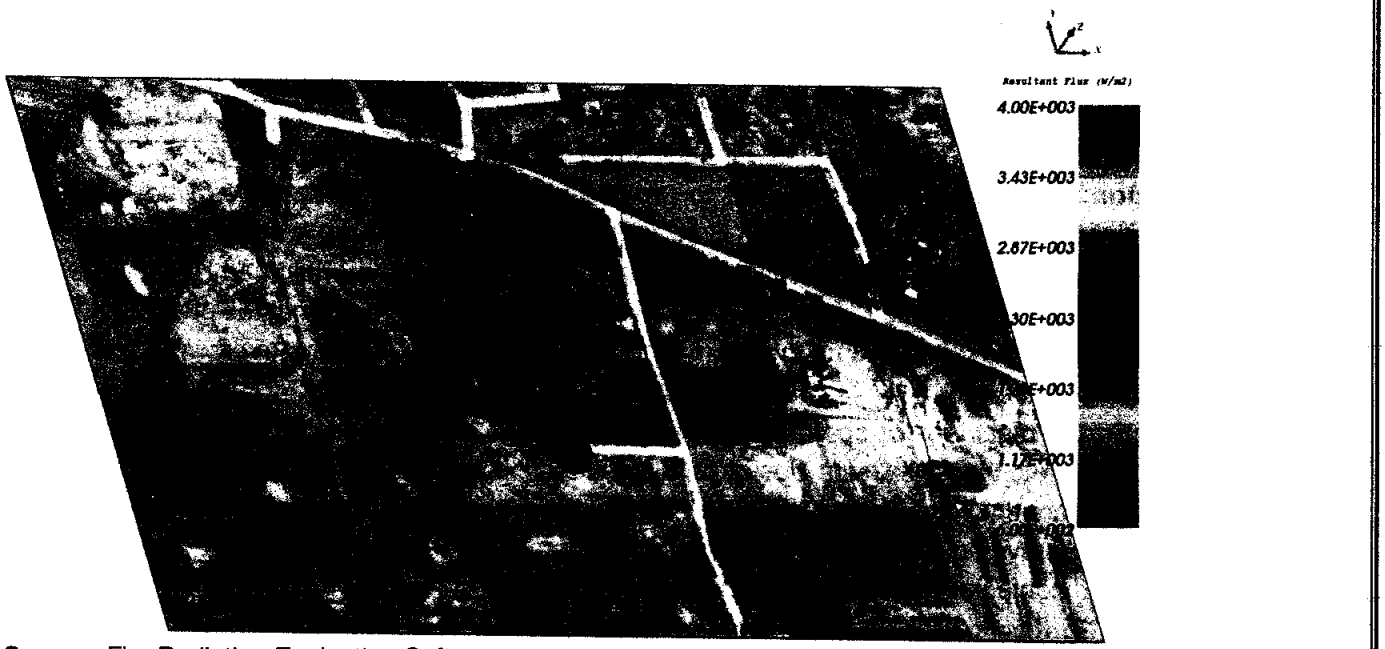


Source: Fire Radiation Evaluation Software

Fig.7.35: Impact Area Of 37.5 Kw/m² Heat Radiation-For LDO

Source: Fire Radiation Evaluation Software

Fig.36: Impact Area of 12.5 Kw/M² Heat Radiation-For LDO



Source: Fire Radiation Evaluation Software

Fig.7.37: Impact Area of 4.0 Kw/M² Heat Radiation-For LDO

Result of Consequence Scenario Modelling

Findings of consequence scenario modelling using 3D tools for flammable / toxic cloud dispersion. It is observed that in the worst-case weather scenario considered, all the pool evaporation cases failed to form flammable cloud.

Results of Pool fire simulations for the three chemicals considered for different thresholds are tabulated. The maximum distance observed for 4 KW/m2 - heat flux to which a person can be exposed up to 20s without attaining second degree burns is found to be ~ 72 m. This distance is sufficient to evacuate the personnel into safety during fire accidents.

Table 7.9: Threshold distances for Fire simulations

Material	Threshold Heat Radiation extent		
	4 KW/m2	12.5 KW/m2	37.5 KW/m2
Acetone	34.93 m	29.73 m	26.77 m
Toluene	49.86 m	35.73 m	25.67 m
Xylene	54.71 m	30.39 m	14.03 m
LDO	96.80 m	67.81 m	38.83 m

From The Results It is recommended that

As an important safety consideration, containment of the spill is required to prevent the tank contents from escaping into the environment and enable the controlled recovery, treatment or disposal of the spill. Therefore, storage tanks are must be located within a containment area surrounded by a dyke wall or bunds.

7.4.2 Safety Precautions / Preventive measures

1. Safety Precautions during Construction phase

Required PPE will be provided to cover occupational injury to foot, head, hearing, and eye

- **Fall Protection:** The Contractor is required to provide fall protection to employees who are working at heights equal to or greater than 1.8 m. fall protection can be in the form of perimeter protection such as guardrails and toe rails, harness, personal protective equipment (PPE), a safety monitoring system, or a fall protection plan. Activities that require personal fall protection systems include steel erection bolting, riveting, fitting-up and plumbing-up, work over water and some deep excavation work.
- **Foot Protection**: If machines or operations present the potential for foot injury, the contractor will provide foot protection with safe design and construction for the work to be performed. Workers and visitors shall not be allowed on a construction site without safety boots. The foot protection will be provided for workers working with concrete or cement. Gum boot shall be provided to avoid contact with cement/RCC mixtures and mortar.
- **Head Protection:** If head hazards remain after all steps have been taken to control them (safety nets for work at heights, proper housekeeping), the Contractor will provide workers with appropriate head protection. Safety helmet will be recommended. When the worker is carrying load on the head a suitable head protection will be provided.
- **Noise Protection:** Workers shall wear hearing protection devices (ear plugs, ear muffs, canal caps), whenever the diesel operated engines, DG set or other noisy machines are operating in the area. The operation of these machines during night after 10 PM shall be strictly avoided. The workers shall be informed the hazards and long term effect of working in noisy area.(e.g. loss reduction in hearing over a period of 5 to 10 years)
- **Eye Protection:** When operations present potential eye injury from physical or chemical elements, the Contractor will select, provide, maintain and required affected workers to use appropriate eye protection. Eye protection is required while working on RCC dismantling, steel fabrication, welding, rough plastering and painting work. Any work which involves looking upside also requires the protection e.g. electrical cabling on walls and ceiling. The various eye protecting devices like safety glasses and goggles, face shields and welding helmets will be provided to workers.
- **Hand protection**: Suitable hand gloves shall be provided for working with cement or mortar. A suitable anti-allergic cream or protecting gel shall be applied on the hands for persons who develop allergy with cement or lime.
- **Electrical Safety**
  - A licensed electrician shall be deployed to complete all temporary wiring and electrical installations required for construction activities.
  - Fuses and circuit breakers (ELCB's) shall be used to protect motherboards, conductors and equipment to avoid short circuiting and electric shock. MCB's and fuses will also to be used to protect the electrical equipment from over current and over voltage.
  - Extension cords for equipment or as part of a temporary wiring system shall not be damaged or compromised in any way and insulation must be of the highest grade.
  - The joints of electrical wires shall be avoided or an extension cord can be used if needed
  - Anytime electrical equipment will be deactivated for repair, or circuits will be shut off, the equipment will be locked out and tagged at the point where it can be energized.

- Proper earthling will be ensured for all equipment and electrical panels
- Temporary lights shall not be suspended by their cords.
- The employer shall provide the necessary safety equipment, supplies and monitoring equipment to their personnel.
- During the operation stage maintenance of transformer and manning of electrical substation shall be by the competent persons only.

2. Action Plan for Safe Handling of Chemicals and Safety Systems/ Safeguards/ Control Measures to Reduce the Risk of Fire, Explosion and Toxic Release

Following mitigation measures will be followed /practiced during transportation, unloading and handling of flammable and toxic chemicals, in order to ensure health and safety of workers involved in handling hazardous chemicals and avoid the human health impacts.

Table 7-10: Effect Distance due to release of Toluene

S. No.	Activity	Safety Precautions
1.	Transportation of solvents like Benzene, Toluene by road tanker.	• Training will be provided to driver and cleaner regarding the safe driving, hazards of Flammable chemicals, emergency handling and use of SCBA sets. • TREM card will be kept with Threshold Limit. • SCBA set will be kept with TL. • Fire extinguishers will be kept with TL. • Flame arrestor will be provided to TL exhaust. • Instructions will be given not to stop road tanker in populated area. • Hazard Identification symbol and emergency telephone number will be displayed as per HAZCHEM CODE. • Appropriate PPEs will be kept with TL.
		In case of leak or spill: • Area will be isolated. • Container shall be isolated. • Source of leakage will be checked. • Damaged containers or spilled material shall not be attended without wearing appropriate protective clothing. • Leakage will be stopped, if possible to do so without risk. • Water spray will be used to reduce vapors (but do not put water directly on leak, spill area or inside container). • Combustibles (wood, paper, oil, etc.) will be kept away from spilled material.
2.	Unloading of solvents from tanker.	• Priority will be given for Tankers to immediately enter the storage premises at site and will not be kept waiting near the gate or the main road.

S. No.	Activity	Safety Precautions
		• Security person will check License, TREM CARD, Fire extinguisher condition; SCBA set condition, Antidote Kit, required PPEs as per SOP laid down. • Store officer will take sample as per sampling SOP from sampling point. • After approval of QC department unloading procedure will be allowed be started. • Following precautions will be taken during unloading: 1. Wheel stopper will be provided to TL at unloading platform. 2. Static earthling will be provided to road tanker. 3. Tanker unloading procedure will be followed according to check list and implemented. 4. Flexible SS hose connection will be done at TL outlet line. 5. All TL valves will be closed in TL. 6. Only day time unloading will be permitted.
3.	Solvents storage Tanks safety.	• SS storage tank will be provided as per IS code. • Vent will be connected to water trap and vent of water trap will be provided with flame arrestor. • FLP type pump & electric fittings will be provided. • Double static earthing will be provided to storage tank, as per the requirement. • Double Jumper clip will be provided to all solvent handling pipeline flanges. • Dyke wall will be provided to storage tank. • Dumping /Drain vessel/alternate vessel will be provided to collect the spillage material inside the dyke wall. • Level transmitter will be provided with low level/high level auto cut-off provision. • Workers and Operators handling such materials shall be trained for the hazards (fire/explosion, health, chemical reactivity, etc.) & safety measures associated with them. • NFPA label (hazard identification) along with capacity of chemical will be displayed on respective tanks & drums. • Pipes and equipment shall be inspected at regular intervals. • All storage areas shall be isolated from all sources of open flame and well posted with "Hazardous Chemical Storage", "No Smoking", "Hot work Restricted" signs.

S. No.	Activity	Safety Precautions
		• Spark-resistant tools will be used. • Water spray will be used to reduce vapors (by taking care that water is not directed straight away on leak, spill area or inside container). • Combustibles (wood, paper, oil, etc.) will be kept away from spilled material. • Storage area will be provided with adequate firefighting/ extinguishing system, Fire hydrant monitor with foam attachment facility, etc. Sand Buckets will be made available.
4.	Solvents transfer from Process Plant to storage tank.	• Double mechanical seal type FLP type pump will be provided. • Double on / off switch will be provided at tank farm and process area near day tank. Pump auto cut off with day tank high level will be provided. • Flame arrestor will be provided on day tank vent. • NRV will be provided on pump discharge line. • Double Jumper clip will be provided to all solvent handling pipelines. • Double static earthing will be provided to day tank.

3. Recommendations to Reduce Fugitive Emissions:

- Regular monitoring of plant area will be conducted and records will be maintained. At strategic point of the plants, online detectors will be provided for detection of such emissions.
- Lines of such hazardous chemicals will be tested periodically and such tests may be recorded.
- All lines carrying toxic liquid will be continuous welded and shall be provided with proper slopes and special tongue and groove joints to avoid liquid stagnation and leakage.
- Increase ventilation when using products that emit VOCs like Acetone & Toluene
- Spill containment kit will be made available.
- Dyke wall will be provided and PPEs will be given to concerned personnel.
- Only trained personnel will be allowed to carry out work in this area.
- In the process area, all the strategic pumps will be of submerged type so as to eliminate leakages from glands.

4. Fire Fighting System / Fire Control Plan:

Considered fire prevention measures at the project planning stage for its upcoming new facility to avoid any outbreak of fire. By looking to the hazardous nature of process and the chemicals that are handled and processed, the chances of outbreak of fire cannot be totally ignored. Hence to tackle such a situation, company has developed proposed, well-resourced and adequate fire protection system/firefighting network. The management has proposed to keep the following extinguishers at site:

Other Firefighting measures proposed for the new facilities:

- Fire load calculation will be carried out and accordingly firefighting facilities comprising of main pump, stand by pump, jockey pump, diesel driven pump, Hydrant Network, automatic fire detection and control system, hose box, hose reels, underground water reservoir, Manual call points, fire alarms, fire buckets, smoke / heat detectors etc. Will be provided as per the GFR and TAC guidelines.
- Also, flame detectors, smoke / temperature actuated heat detectors with alarms, automatic sprinkler system, shall be installed at conspicuous locations as per the requirements.
- Company will have Fire Water Tank of adequate capacity to combat the emergency, if arise, water reservoir shall also be made available, if required.
- Preventive maintenance of firefighting facilities (Fire water pump, drive engines, hydrants, monitors, alarm systems, etc.) shall be carried out periodically.
- Working staff will be trained to operate DCP and CO2 extinguishers.
- DG set will be available as a separate power backup for fire network.
- Company will do tie up with Fire Brigade and nearby companies, for handling emergency situations.
- Electric driven alarms & sirens will be placed at the conspicuous locations. Hand Bell will be used in case of power failure.
- Factory Layout will be designed in such a way, that it will have a provision for separate entry and exist with adequate margin all around the periphery for unobstructed easy movement of the emergency vehicle / fire tenders without reversing back.

5. Cylinders Storage and Handling:

- All compressed gas cylinders will be stored in the upright position.
- Valve protection caps will be placed on compressed gas cylinders that are in storage or are not being used.
- Compressed gas cylinders will not be lifted by the valve protection cap.
- Compressed gas cylinders will not be stored in hazardous areas.
- Compressed gas cylinders will be hoisted on the cradle or compressed gas cylinder basket.
- Compressed gas cylinders shall not be placed against electrical panels or live electrical cords where the cylinder can become part of the circuit.
- The dented, cracked or other visibly damaged cylinders shall not be used.
- If gloves are greasy or oily, do not handle cylinders.
- Cylinders shall not be transported without first removing the regulators and replacing the valve protection caps.
- While opening the valve, stand to the side of the regulator.
- Hoist or transport of cylinders by means of magnets or choker slings shall not be done.
- The cylinder valves will be opened slowly.

7. Ways to Minimize the Manual Handling of the Hazardous Chemicals:

- SOPs, work instructions will be prepared and followed.
- Fork lifts will be used for unloading chemical bags, bags movements within plant, etc.
- Cranes, hoists, pallet trucks, conveyors, etc. shall be used as per the requirement, to eliminate manual handling.
- Lifting tools & tackles will be used, wherever required.
- Trainings will be provided to relevant staff, operators, workers for the risk associated with manual handling of hazardous chemicals, ways to overcome those risk, etc.

8. DO'S & DON'TS:

Management has listed some of the Do's & Don'ts activities to strengthen the SAFETY AT WORK, which will be followed strictly:

For Preventive Maintenance

Do's:

- Ensuring that operators/workers etc. follows the SOPs, Safety procedures & standards, work permit system etc.
- Inspection of Storage Area, Earthing & Bonding system.
- Inspection of all Fire Fighting Facilities /Check Alarms operation.
- Checking the availability of Spill Containment Kit.
- Make sure existing fire extinguishers are fully charged and ready for action.
- Inspections of plant, machinery, tools, equipment, premises, work practices, processes, procedures and general environment must be carried out for the health and safety of plant, people and surrounding.
- On-site and Offsite Emergency Plans shall be reviewed and updated, as per the requirement.

Don'ts:

- Don't allow anyone who hasn't received specific safety and operational training to get indulge in any site activity.
- Don't perform any activity without proper permit.
- Don't perform your own maintenance.
- Don't compromise on Design and Engineering part.
- Don't panic if you are in a risky situation.
- Don't allow spilled chemicals to drain to sewers/gutters etc.

Strengthening of HSE (Applicable for Manufacturing Utility Staff)

Do's:

- Follow instructions. Do not take chances. If you don't know, ask.
- Correct or report unsafe conditions.
- Include a timeline for completion of each recommendation.
- Make recommendations that are measurable and trackable.
- Ensure that each recommendation is assigned to an individual to oversee implementation.
- Help keep things clean & orderly. Keep gangways clear.
- Do not Horseplay. Do not run. Avoid distracting others. Avoid throwing things.
- Report all injuries. Get first aid promptly.
- Use, adjust and repair equipment only, when authorized.
- Use right tools & equipment's for the job, use them safely.
- Do not smoke in restricted areas. Do not flick cigarette/beedi in company.
- Use prescribed protective equipment; keep them in good working conditions.
- Respect signs / warnings. Abide by rules laid down for your safety.

Don'ts:

No worker in a factory-

- Shall willfully interfere with or misuse any appliance, convenience or other thing provided in the factory for the purpose of securing the Health, Safety or Welfare of the workers therein:
- Shall willfully and without reasonable cause do anything likely to endanger himself or others; and
- Shall willfully neglect to make use of any appliance or other thing provided in the factory for the purposes of securing the Health or Safety of the workers therein.
- Do not make vague statements, do not overrule supervisor and do not adopt shortcuts.

9. Antidotes Details:

Following Antidotes for major Hazardous Chemicals shall be kept available at Site. Other than that, first aid boxes & relevant Antidotes for major hazardous chemicals shall be kept available within the premises.

ACIDS

Poisoning due to Acids can be treated by following steps:

- Use alkalis, 4% solution of Sodium Hydrocarbonate, oil, stimulants, demulcent drinks; large draughts of lime water or milk with whiting, baking soda or milk of magnesia;
- Strong soap suds to neutralize acid; olive oil; these to be followed by demulcent drinks.

CAUSTIC

- In case of Skin contact: Wash the affected area with plenty of water
- In case of Eyes Contact: Wash the affected area with plenty of water
- Vinegar water.

10. Safety Precautions system for visitor

Visitor card to be provided to each visitor with gate pass & Visitor badge; which will contain the Rules & Information as below:

ID Badges: ID Badges must be worn and visible at all times. They are to be returned to the reception desk/security gate when leaving the premises.

Mobile phone: Mobile phones with a camera function must not be used on these premises. The use of mobile phones is strictly prohibited in designated areas

Electronic devices: Electronic devices may not be connected to the company network without authorization

Smoking is prohibited: Smoking is prohibited on the company premises. The sale and consumption of tobacco products, alcohol and other narcotic substances is forbidden

Personal protective equipment (PPE): PPE must be worn in many areas of site. For your own safety you must wear the appropriate protective equipment when entering these areas.

Alarm Signal: Obey alarm signals and follow the instructions of the fire safety team. A triggered piezo siren signal indicates a fire system alarm and alerts the fire safety team. However, piezo sirens emitting a continuous tone indicate that you must evacuate the building immediately.

Emergency Call: To report an accident or environmental incident, please call our internal emergency number on XXXX/XXXXXX. Please contact the emergency services; if there is any immediate danger. Emergency personnel will provide further instructions. Manual call points can be used to alert the fire brigade directly in the event of a fire.

Emergency Exit: Please leave the danger zone immediately and warn people at risk. In the event of fire, try to put out the fire with a fire extinguisher, if possible. Escape routes are marked in green on the emergency and evacuation plans displayed inside buildings. In the event of an evacuation, please proceed to the appropriate assembly point.

Assembly Point: Make your way to one of the designated assembly points and await further instructions. Report any missing colleagues to management at the assembly point.

First aid boxes: First aid boxes are provided for treating injuries, and qualified first aiders are on hand during working hours.

7.5 DISASTER MANAGEMENT PLAN (DMP)

In order to be in a state of readiness to face any accident or disaster caused by the project operation, a Disaster management plan is required to be prepared. The plan will cover possible disaster, On and Off-site emergency preparedness plans, establishment of emergency Control Centre (ECC), Location of emergency services and duties of officers / staff during emergency.

Basically, DMP contains following aspects

1. Description of site
2. Brief description of the plant
3. On – site Emergency plan
4. Off- site Emergency plan

Classification of Emergency:

LEVEL – 1

The incident or emergency which are confinable, controllable within the plant premises, which under normal circumstances does not affect area outside the said plant battery limit and controlling does

not involve / require external help. This situation is called emergency stand by and affected unit / plant have to handle emergency

It may be due to

- Small pipe/valve rupture or similar leakages that do not affect outside premises.
- Release of toxic chemicals for short duration.
- Small fire in the plant.

LEVEL – 2

When the incident or emergency is not controlled within 10 to 15 minutes or does not come under control within 10 to 15 minutes, incident controller, site main controller reviews the situation and decides if situation is Worsening.

It may arise due to -

- Leakage of toxic chemicals for long duration.
- Medium scale explosion confined to the factory premises.
- Medium scale fire inside the factory premises.

LEVEL – 3

After surveying off-site implications of level – 2 emergencies if there is a likely hood of chemical/material gas cloud formation and spreading of cloud in down wind direction affecting neighboring population of industry and villagers and / or in case of following incident IC and SMC are of the opinion that there will be off-site implications.

It may arise due to -

- Heavy / Profuse leakage of toxic / Flammable gases for a long duration.
- Explosion of high magnitude affecting the adjacent area.
- Major fire inside the factory premises.

Note: Level-I and Level- II shall normally be grouped as onsite emergency and Level- III as off- site emergency.

Mode of Emergency

Man made	Natural Calamities	Extraneous
• Heavy Toxic Leakage/ Spillage • Fire • Explosion • Failure of Critical Control system • Design deficiency • Unsafe acts • In-adequate maintenance	• Flood • Earthquake • Cyclone • Outbreak of Disease • Tsunami	• Riots/Civil Disorder/Mob Attack • Terrorism • Sabotage • Bomb Threat • War/Hit by missiles • Food Poisoning/Water Poisoning

On-Site Emergency

The On-site emergency plan: deals with, measures to prevent and control emergencies within the factory and not affecting outside public or Environment.

Off-Site Emergency

The Off-site emergency plan: deals with, measures to prevent and control emergencies affecting public and the environment outside the premises.

7.5.1 Structure of Emergency Management System

Pryagraj Impex LLP shall develop an Emergency Management Team. The management structure shall include the following personnel's;

- Site Main Controllers
- Incident Controllers and Deputy Incident Controllers
- Key Personnel's
- Essential Workers

The other elements of Emergency Plan shall be:

- Assembly points
- Emergency control center
- Fire control arrangements
- Medical arrangements
- Other arrangements

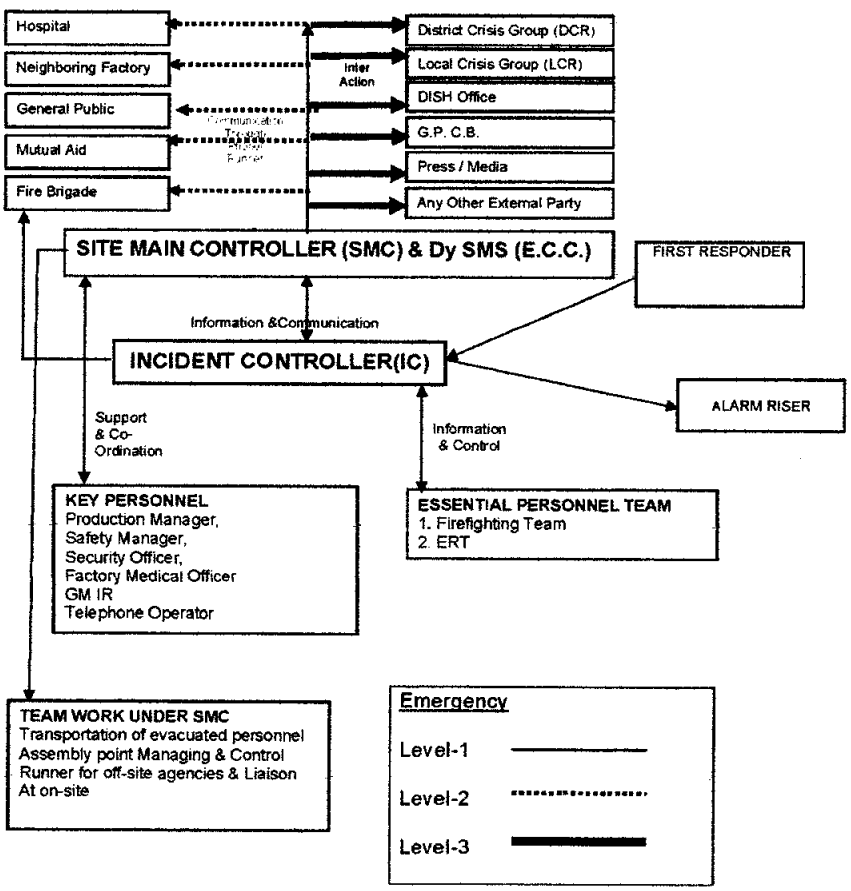


Figure 7.38: Emergency Organization Chart

A. Role & Responsibility of Emergency Management Team

Site Main Controller (SMC)

Senior most Executives (Supervisor) of the company shall be nominated as SMC. His task will be to co-ordinate all internal and external activities from the Emergency Control Centre (ECC) at Main Security Gate, from where all operations will be directed. He shall:

- Immediately on being informed of the emergency and its location, will arrive at the site, review the situation and control further actions.
- Direct all Emergency Operations within the approved area with the following priorities:
  1. Personnel Safety,
  2. Plant, Property and Environment Safety and
  3. Minimum loss of production.
- Co-ordinate to avail services from external agencies like fire brigade, hospitals etc, if called for, following the declaration of major emergency. If necessary, major installations in the vicinity may also be informed of the situation.
- Exercise direct operational control of the unaffected section of the plant.
- In consultation with the advisory team, expedite the shutting down of loading / unloading operations of tankers and if necessary, instruct the supervisor / security personnel to evacuate tankers.
- Ensure that all employees are evacuated from the affected area and the casualties, if any, are given necessary medical attention. Instruct P & A Assistant / Security for rushing casualties to hospitals if required.
- Liaise with fire and police officials, pollution control board officials and other statutory bodies and advise them of all possible consequence effects outside the premises.
- Arrange for relief of personnel when emergency is prolonged.
- Issue authorized statement or press release to the news – media.
- Ensure preservation of evidence for enquiries to be conducted by statutory authorities.
- Authorize the sounding of "All Clear" and "Evacuation Siren".
- Arrange for obtaining the head – count of all personnel within the premises and cross-checking with the data from records available for no. of persons within the premises.
- Nominate a person from advisory team, to maintain chronological log of event during the entire period of emergency.

Role of Incident Controller (IC) and Deputy Incident Controller (DIC)

Respective Shift In-charge of the Plant (Site) & Department holds the responsibility of the Incident Controller, if the incident is in their plant/area. Two Production officers in each shift will be identified as Deputy Incident Controllers.

His primary duties shall be to take charge at the scene of the incident. In the initial stage he may be required to take decisions involving the operation of the other plants or to stop or continue any process and to take technical decisions to control the incident. The deputy incident controller will take the charge of incident controller, if he is not available due to any reason. They will be always available in each shift and can take charge of the incident.

Responsibilities/Duties of Incident Controller and Deputy Incident Controller:

- He shall take charge at the scene of incident.
- He shall immediately assess the gravity of risk and alert panel and field operators to start controlling their respective section.
- if the emergency is minor, try to prevent by using internal resources like fire extinguishers in case of fire, and cover the spillage by sand in case of liquid spillage.
- He will work under the direction of the SMC, but till his arrival he may have to execute following responsibilities.
  - He will ensure that all the Key Personnel are called.
  - Direct for evacuation of plant and areas likely to be affected by the emergency.

- He shall communicate to the SMC the type of outside help needed.
- He shall direct all emergency operations within the affected area with the following priorities.
- Personnel safety, including of surrounding community.
- Minimum damage to Plant, Property and Environment.
- Appropriate actions to minimize loss of Production and Material.
- Give information to the head of firefighting and rescue team and other emergency services.
- Depending on the incident, instruct partial or total shut down, isolations, depressurization, Nitrogen purging, firefighting and rescue operations.
- Instruct upstream/downstream units to take emergency shutdown /cutting off supply and other appropriate actions and emergency evacuation help etc.
- Direct for search of casualties.
- Evacuate non-essential workers/visitors/contractors to safe assembly points.
- Brief site main controller and keep him informed about the developments.
- Preserve evidences. This will be necessary for investigation for cause and concluding preventive measures.

Key Personnel

Senior officers of various departments like Fire, Security, Safety, Administration, Engineering, Project, Production, Transport, Pollution control, Technical Services and Stores shall be nominated as Key Personnel in their respective fields. As necessary, they shall decides the actions needed to shutdown plants, evacuate personnel, carryout emergency engineering work, arrange for supplies of equipment's, utilities, carryout environment monitoring, provide catering facilities, liaise with police, fire brigade and other local authorities, relative of casualties, hospital, press & neighboring industries, action at assembly points, outside shelters and mutual aid center under the direction of the SMC. All the key personnel and other called in so to assist, shall report to the ECC. They shall be available at any time on duty or on call or on holidays.

The responsibilities and duties of key personnel are as follows.

Production Manager

- To keep in touch with IC & SMC in assessing/ controlling the emergency.
- To guide essential personnel team.
- To guide personnel for safe close down of the plant.
- To guide transport for safe shifting of materials from one place to other.
- To guide mutual aids services and the teams.
- To keep informed the SMC about developments.
- To make arrangement like emergency light, water etc.
- To assess the emergency & evacuate the neighboring factory workers and neighboring population through SMC.
- To inform the effect of emergency and steps to be taken to avoid the effects of a radiation etc.

Safety Manager

To assist incident controller in controlling emergency

- To help site main controller in communication.
- To provide necessary equipment like FFE (Firefighting Equipment), PPE & RPE.
- To guide transport for safe shifting of materials from one place to other.
- To guide mutual aids services and the teams.
- To keep informed the site main controller about developments.
- To make arrangement like emergency light, water etc.
- To assess the emergency & evacuate the neighboring factory workers and neighboring population through SMC.
- To inform the effect of emergency and steps to be taken to avoid the effects of a Fire etc.

Security officer

- To help incident controller & site main controller at the time of emergency.
- To cordon the area and inform incident controller or site main controller about the development of emergency.
- To fight the fire with available internal FFE.
- To make arrangement for evacuating workers from the place of accident and guide non-essential workers towards company assembly point.
- To carry out head counting at assembly point &search of missing persons.
- To ensure that the roadway to plant is clear for emergency vehicles. Obtain assistance to keep roadway clear and to stop non-emergency traffic from entering.
- To direct their personnel (Response force & Task force) for evacuation of non-essential workers & Crowd control.
- To liaise with mutual aid services for their help and guide to them.
- To blow emergency siren & all clear siren on receiving message from IC/SMC through telephone office

General Manager-IR

- To assist site main controller & incident controller in controlling emergency.
- To guide mutual aids services and the teams.
- To keep informed the site main controller about developments.
- To make arrangement like emergency light, water, etc.
- To arrange external help like Medical, Fire, etc.
- To assess the emergency & evacuate the neighboring factory workers and neighboring population through SMC.
- To inform the effect of emergency and steps to be taken to avoid the effects of a Fire etc.
- To deal with external communication like media & external agencies

Adjacent Plant In-charge

- To assist site main controller & incident controller in controlling emergency
- To help site main controller in communication.
- To guide mutual aids services and the teams.
- To keep informed the site main controller about developments.

Telephone Operator

- He will guide all visitors of admin building to move at assembly point.

Essential Workers (EW)

Essential Workers shall be those who shall be trained in Fire Fighting and First Aid. One Supervisor and two helpers from each shift will be identified as EW's & shall supposed to report at EMERGENCY SITE to take instructions from IC or DY. IC Such work instructions will include:

Security system

- A premise is covered by fully fencing and Main gate is secured by guard for 24 hours.
- All transport vehicles are checked at the gate for driver licenses, MSDS, Emergency Information Panel and for any unwanted / undesired threat material etc.
- Security staff takes round throughout the factory for security of plant & others.
- CCTV camera installed at all critical locations.

Communication System

Communication System is a Crucial Factor while handling emergency. Company has quick & effective Communication System through which, any situation, which can lead to emergency, can be informed or known to:

1. All persons working inside the plant.
2. Key Personnel outside during normal working hours & during off-duty hours.
3. Outside emergency services, Statutory and Local Authorities &
4. Neighboring facilities and public leaving in vicinity.

Each and every section, Plant & Department of the Factory will be connected by internal telephones with SMC, Supervisor or IC's. External Phone at Office and Residence and Mobile shall also be made available with Key Personnel and top executive of the factory. The Communication System shall begin with raising the alarm declaring the emergency, Telephone messages and Procedure to communicate the emergency to other persons & General Public.

Raising the Alarm

As soon as incident takes place inside the factory and is noticed by someone, the first step shall be to raise the nearest manual emergency bell to alert the nearby people. Next, he/she shall inform the security persons to raise the emergency siren located at the factory gate. The security personnel sound the siren.

The alarm sound informs the I.C and the S.M.C that an emergency has been created and emergency organization plan to be activated. The I.C. rushes to the site and shall takes charge of the scene.

Declaring the Major Emergency

Major emergency is declared after sufficient and thorough check because the declaration of major emergency puts many agencies on action and it may disturb the running system, which may be Costly at, time or its Consequence may be Serious. Therefore, major emergency must not be decided on whims or immature judgment or without proper thought. Looking to all the above, we shall nominate the persons (SMC: Director & Incident Controllers) who can declare the emergency; we have selected them on the basis of their knowledge & experience. These persons will be technically qualified and experienced. The decision about major emergency shall be taken as early as possible and without wasting time so that control action can be started immediately.

Telephone Message

A Telephone operator who is precise, sharp, attentive and quick in receiving and noting the message and subsequently effective in further Communication, shall be appointed. A form to record emergency telephone calls will be available with telephone operator or Person available in Emergency Control Center, who shall record such calls during emergency. Telephonic messages shall be given out by the telephone operator to Site main Controller and key personnel as per the instructions of the Incident Controller. Telephonic messages will also be given to authorities and external agencies to describe the type of emergency. All details of emergency will be collected/ delivered according to this format, available with the telephone operator.

Communication of Emergency & Statutory Information

Communication of Emergency

An effective system to communicate emergency shall be made to communicate about the emergency situation as mentioned below:

- Inside the factory i.e. workers including key personnel and essential workers, on duty & inside during normal working hours.
- To key personnel and essential workers not on duty and outside during normal working hours.
- To the outside emergency services and the Government authorities.
- To the neighboring factory & the General Public in the vicinity.

Statutory Information

a) Information to Workers

Set of Statutory information regarding types of hazards and their prevention and control as directed in the Factories Act shall be prepared by the unit. This information shall be printed in the local language and will be given in the form of booklet to all workers including contract workers.

b) To the outside emergency services and authorities

Statutory information in the form of booklet will be given to outside emergency services and authorities, if required.

c) To neighboring firms and the general public

Statutory information in the form of booklet will be given to neighboring units and the general public of the villages in the vicinity of the unit, if required.

Emergency Time Activities

The probable emergency situation that can arise in the unit and the corresponding control actions as described below shall be followed:

Toxic Releases

Source / Incident –

- Pressure release due to failure of
- Stuffing box gland packing
- Pressure release valve
- Vessel / pipeline failure

Following Control Actions will be taken –

1. Anyone who notices the release shall sound emergency alarm.
2. SMC/IC who is at site, shall immediately rush to the scene and assess the situation. For toxic release from a reactor, he activates the on-site plan as –
   - He evacuates all the persons to safe assembly point.
   - He calls in DIC (if DIC is not present there) and asks essential workers to wear self-breathing apparatus and if the reaction is exothermic, start cooling water flow in the reactor jacket and cool the reactor as soon as possible.
   - The essential workers stop all the charging pumps of that reactor and the nearby reactors.
   - He informs mutual aid teams and asks for necessary help.
   - He arranges first-aid / hospitalization for the affected persons.
   - Mutual aid teams shall be asked for help in the form of first-aid, transport etc.
   - When the leak stops and the air shall clear of toxic release, IC tells essential workers to sound all clear.
   - The vessel / rupture disc/gland packing will be attended by maintenance department.
   - The incident shall be recorded
   - SMC arranges to inform families / relatives of injured / dead.
   - SMC issues authorized statement to press / media.
   - SMC informs Factories Inspector about the incident and related information

Chemical Spill

Most of the storage tanks shall be located in Storage Tank Yards. Dyke walls shall be constructed around the tank yard. Neutralizing material shall be kept available. For dilution, water connection will be provided on all sides of tank farms. Sand buckets shall be available for covering spillage of flammable / corrosive materials.

Safety Awareness among the workers

Details of training and periodic retraining programs for the personnel of safety and fire department

Security guards who act as firemen during fire emergency are trained, retrained and refreshed on regular basis. Safety professional is sent for external training and some training program also conducted at works site by external experts of the field.

Details of Training and retraining programs for the workers

Training programs on safety aspects with special attention to firefighting are regular feature of company. Plant organizes 3-4 sessions every month on safety aspects and cover good number of workmen in these programs.

All these training programs would at least include the following:

- Lectures
- Seminars and workshop
- Practical Exercises
- Distribution and practice safety instructions
- Safety quiz contests/competitions for individual as also for groups
- Display of safety posters and safety slogans at convenient and conspicuous places.
- Explanation of instructions (in the language easily understood by workers) about the possible hazards involved in handling of chemicals ad methods to deal with such hazards failing which possible emergency situation are likely to arise.
- Developing safety instructions for every job and ensuring practice to these instructions/ booklets or manuals by workers.
- Educating workers about the:
  - Physical and health hazards arising out from the exposure of handling substance
  - Measures taken to ensure safety and control physical and health hazards.
  - Measures to be taken by workers to ensure safe handling, loading and unloading.
  - Storage and transportation of hazardous substances.
  - Meaning of various labels and marking used on containers of hazardous substances and to whom to report.
  - Measures to be taken in case of any spillage or leakage.

7.6 OCCUPATIONAL HEALTH AND SAFETY PROGRAMME

M/s Prayagraj Impex LLP has prepared the Occupational Health Surveillance Program which will be followed right from the project construction & erection phase and the same shall be updated for the upcoming new facility, if required. The details of the same are described in the following sections.

7.6.1 Occupational Health

Occupational health needs attention both during construction & erection and operation & maintenance phases. However, the problem varies both in magnitude and variety in the above phases.

7.6.2 Hospital Facilities /Factory Medical Officer & OHC

- Company shall made formal agreements with nearby hospitals having facilities to attend fire and toxic effect cases, emergency cases, attending the affected persons in the emergency arising out of accidents, if any, etc.
- A qualified doctor will be appointed as FMO on retainer ship basis. Apart from him, required medical facilities applicable as per Factories Rules and Factories Act shall also be made available.
- All types of first aid related accessories, Medicines & Antidotes as prescribed by FMO, etc. shall be made available at conspicuous locations.

7.6.3 Ambulance Van & First Aid Box

An Emergency Vehicle shall be made available round the clock to be used as an Ambulance during emergency.

First Aid Boxes will be made available at the different location in the plant. Training shall be given to employees for First Aid.

7.6.4 Plan for Periodic Medical Checkup

Periodic Medical Examination shall be conducted as per the following schedule;

Workers employed will be examined by a Qualified Medical Practitioner/ Factory Medical

Officer, in the following manner:

1. Before employment, to ascertain physical fitness of the person;
2. During employment, every six months (blood & physical examination) as per Factories Rules, to ascertain physical fitness of the person to do the particular job;

7.6.5 Details of Occupational Health Impacts and Safety Hazards

Occupational Hazards Identification	Occupational Health Impacts
Exposure to Toxic & Corrosive Chemicals	Toxication, Irritation,
Exposure to Chemical Dust, Spillage/ leakage, Overflow	Severe irritation to eyes & skin, Respiratory disorder, Fatality, etc.
Slip/trip, fall, electric shock, etc.	Body Injury, Burns, Skin sensitization, Fall Injury, Electrocution, Damage to nearby equipment's, Fatality, etc.

Mitigation measures/ Safety Measures proposed to avoid the human health hazards are mentioned under section 4.4.5. In addition to these safety measures, personal protective equipment (IS approved) like safety Helmet, Safety shoes/ Gumboots Hand gloves, Gas Mask / Nose Mask, PVC apron, SCBA Set, PVC pressure suit, goggles, hood, etc. will also be provided to the required personnel.

7.6.6 Details of Work Place Ambient Air Quality Monitoring Plan

Work zone monitoring will be carried out by independent competent third party every month. Records will be kept as per applicable Factories Rules. Location for samplings shall be identified. Ambient Air & Noise Monitoring shall be done every 3 months as per HSPCB CCA requirements. Following information will be incorporated in the format for maintaining records of work zone monitoring:

- Location/Operation monitored
- Identified contaminant
- Sampling instrument used
- Number of Samples
- Range of contaminant concentration as measured in sample
- Average concentration
- TWA concentration of contaminant (As given in Second Schedule of Factories Act)
- Reference method used for analysis
- Number of workers exposed at the location being monitored
- Signature of the person taking samples
- Other relevant details

7.6.7 Monitoring of The Occupational Injury & It's Impact on Workers

Following action plan will be prepared & followed to monitor the occupational injury to workers:

- Each workplace will be evaluated for the existing work conditions.
- Unsafe Act & Unsafe Practices will be identified.
- Unsafe equipment's, unsafe areas, etc., will be identified.
- Area will be checked for proper Ventilation and Illumination.
- Air-borne concentration of toxic chemicals will be measured and records will be kept.
- Evaluation of training & on the job work.

Impact of the above-mentioned unsafe conditions on workers will be studied and remedial measures for the same will be adopted.

7.6.8 Provision of Industrial Hygienist & Health Evaluation of Workers

- It is proposed that management will develop a plan to check and evaluate the exposure specific health status evaluation of workers.
- Workers will be checked for physical fitness with special reference to the possible health hazards likely to be present, where he/she is being expected to work before being employed for that purpose. Complete medical examinations including PFT, Urine and Blood examination, Liver Function tests, chest X-ray, Audiometry, Spirometry Vision testing, ECG, etc. shall be carried out. However, the parameters and frequency of such examination will be decided in consultation with Factory Medical Officer and Industrial Hygienists.
- While in work also, all the workers will be periodically examined for the health with specific reference to the hazards which they are likely to be exposed to during work. Again, the parameters and frequency of such examination will be decided in consultation with Factory Medical Officer and Industrial Hygienists. Plan of monthly and yearly report of the health status of workers with special reference to Occupational Health and Safety, will be maintained.

7.6.9 Safety Trainings & Mock Drills

Safety trainings (on Safe Material Handling, First Aid, & all Safety Aspects) shall be provided every 15 days by the Safety Officers with the assistance of faculty members called from other Professional Safety Institutions and Universities. In addition to regular employees, limited contractor labors will also be given safety training. To create safety awareness, safety films shall be shown to workers and leaflets shall be distributed.

Mock Drills: To evaluate the effectiveness of emergency preparedness and to spread the awareness among employee's mock drill will be carried out at the interval of every six months. After completion of the mock drill, summary report shall be made and corrections will be done if any weakness has been observed.

Frequency of Mock Drills: On-site emergency: Once every 6 months.

Off-site emergency: Once every year

7.7. SUMMARY

Additional studies include Identification of hazards in the proposed project activity is of primary significance. Qualitative and Quantitative both risk has been analyzed. Risk Assessment and hazard identification and control measures of the same have been carried out. Prayagraj Impex LLP will develop Emergency preparedness plan and Disaster Management Plan. Fire alarm panel (electrical) will cover the entire plant. The Environmental Management Cell (EMC) will handle of all the related activities such as collection of statistics of health of workers and population of the region, afforestation and green belt development. The fire protection system for the unit will be provide for early detection, alarm, containment and suppression of fires. The Occupational Health Centre with adequate facilities will available at plant site to maintained round the clock by a compounder cum

dresser and a doctor. Medical Personnel/Medical Doctor will be available at site for emergency relief. First aid kit will be provided. Appropriatepersonal protective equipment will be provided to all workmen as and when required. All records of On-Site and Off-Site Emergency Plan shall be well maintained and preserved. A capital Budget of **Rs 5 Lakhs** has been allocated for Occupational Health and Safety.

8. PROJECT BENEFIT

8.1. GENERAL

M/s. Prayagraj Impex LLP is intended to install a fractional Distillation plant of Petroleum Crude at Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107. The new project will benefit the country, region and local community, since it will address shortages in the market through sale of quality products. Earn the country foreign exchange through export of Specialty Chemicals. Generate direct and indirect employment, locally. Increase the revenue base of the Local, State and Central Governments. The project will compensate the demand of Specialty chemicals in India. Feed stock heavy Aromatics / Mixture of Hydrocarbons Petroleum Crude available from the market resources in regular basis. The facility is proposed with distillation process to separate different value-added products market for finished material is observed as good Petroleum refining has evolved continuously in response to changing consumer demand for better and different products.

8.2 PHYSICAL BENEFITS

Major benefits of the project are as follows:

Infrastructure: Local service benefits like establishment of Canteens, tea stalls, truck/car/bike service station, mechanical workshops / vendors etc. nearby the project area. Increase in esthetic look of project site and nearby area through increase in greenbelt development and will serve as air pollutant barrier.

Enhancement of Green Cover:

A greenbelt of 2145 Sq. m. (33.0 %) will be developed in the plant premises. Approx. 10m wide greenbelts will be developed around the plant premises. 537 Nos. of trees are to be planted after first rainfall.

8.3 SOCIAL BENEFITS

Employment Potential:

- In plant, 15 Nos. of person will be employed directly during operation phase.
- All local people shall be employed as per their skills, qualifications and company's requirement during operation phase.

Corporate Social Responsibility:

An obligation, beyond that required by the law and economics, for a firm to pursue long term goals, are good for society. The continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as that of the local community and society at large. The major problem of this area is drinking water and health condition; hence installation of drinking water facility in Ghasera Village will be done. The cost will be 4.00 Lakhs under CER head

8.4 OTHER TANGIBLE BENEFITS

- Project will gain income and upsurge the turnover of M/s Prayagraj Impex LLP
- The proposed project will make India as export hub for Petroleum Crude and Hydrocarbons
- Proposed project will be Zero Liquid Discharge plant, hence no load on Environment.

9. ENVIRONMENTAL COST BENEFIT ANALYSIS

9.1 GENERAL

Environmental Cost Benefit Analysis (CBA) is an analytical way to make an educated decision regarding the commencement of an industrial activity or similar trade/commercial/infrastructure activity.This involves a comparison of the costs of an action with considerations of the benefits associated withthat action. CBA assists the regulators to evaluate the benefits and challenges imposed by theupcoming activity in commercial terms with respective to the impact on the environmental scenario such as human wellbeing, quality of life and environmental wellbeing.

An important component of a CBA is a base situation which is a situation when no changes take place. All decisions are then compared to the base situation. Once the base and a relevant time period are established, benefits and costs can be calculated in terms of human and environmental well-being. In this case, a benefit is defined as anything that increases human well-being, and a cost is anything that decreases it. CBA aims to maximize economic efficiency at a point where marginal benefits and marginal costs are equal.

9.2 APPLICABILITY OF CBA AND SUMMARY

During the scoping/ToR stage, no recommendation of environmental cost benefit analysis was suggested by the appraisal committee.

Moreover, proposed greenfield project of Fractional Distillation of Petroleum Crude and Mixed Hydrocarbons with 12000 KL capacity will be developed on KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107. Hence, conducting a detailed CBA is deemed not necessary for this particular project.

10. ENVIRONMENTAL MANAGEMENT PLAN

10.1 GENERAL

The Environmental Management Plan (EMP) constitutes an important part of the EIA report. The main purpose of EMP is to minimize the identified potential environmental impacts to be generated from the proposed project and to mitigate the consequences. M/s Prayagraj Impex LLP on basis of the impacts identified, sets targets to reduce the negative impacts, plans and decides action plan to achieve the target effectively and efficiently. EMP ensures an effective implementation methodology and alternatives for mitigation measures planned/recommended to reduce or eliminate the adverse impacts to maximum possible extent during the operation of the proposed project.

10.2 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

As mentioned in earlier section, EMP is a system to address potential adverse impacts, to instruct project proponent to introduce standards of good practice to be adopted for all project activities.

10.2.1 Objectives of EMP

Following are long-term objectives of the Environmental Management Plan for all the environmental attributes:

- To comply with all the regulations stipulated by Central /State Pollution Control Boards related to applicable laws.
- To create good working conditions.
- To encourage support and conduct developmental works for the purpose of achieving environment standards and to improve methods of environment management.
- Streamline environmental activities to add value to efficiency and effectiveness.
- To encourage and achieve highest performance and response from individual employeesand contractors.
- To plan out the complete strategy to take care of stakeholder engagement.
- To contribute significantly for sustainable development.

10.3 EMP FOR CONSTRUCTION PHASE

Proposed project shall be carried out in industrial area. There will be construction of Production plant, Office & laboratory area, Storage rooms, Utility buildings, *etc.* Anticipated environmental impacts due to proposed project during construction phase are already discussed in chapter — 4 of EIA report. Following environmental management plan will be implemented to mitigate any adverse impact or reduce the magnitude of impact.

- During the transportation of dusty materials, loaded trucks will be covered to avoid PM level in air. Regular spraying of water will be done for dust suppression.
- Green belt area shall be developed as per guideline and with consultation of expert, so thatpropagation of noise from construction activities shall be reduced.
- Emission from construction machineries as well as vehicles shall be minimized as under:
- Electrically operated machineries shall be preferred
- Regular maintenance of vehicles/ machineries.
- Use of vehicles with PUC certificates.

- All construction machineries/equipment and vehicles will be turned off, when not in use.
- Day time construction activities shall only be allowed for avoiding increase in noise levelwithin premises.
- PPEs like ear muffs or ear plugs shall be provided to workers who will have exposure to high noise levels. Minimize the usage of horns and other such noisy equipment which may increase noise generation.
- Regular maintenance of construction vehicles and equipment shall be carried out to reduce the noise level within plant premises.
- The proposed project activities will be carried out in industrial land, thus there will not be any impact on ecology of the surrounding area. Although, the project proponent has made provision to enhance the existing green belt area.
- First aid facilities shall be kept at designated locations and same shall be used for construction workers during construction phase.

10.4 EMP FOR OPERATION PHASE

The industry shall maintain comprehensive environment management plan in place for the proposed unit which shall covers all the environment protection measures to mitigate improvised environmental impact.

10.4.1 Water Environment

The fresh water requirement of 2 KLD will be met through Ground Water. Wastewater generation from proposed plant is mentioned in **Table 10.1**

Table 10.1: Waste Water Generation

S. No.	Activities	Wastewater Generation (KLD)
1.	**Domestic**	0.6
2.	**Industrial Use**	
	CT	Recirculating Water
	Re-Boiler	Recirculating Water
	Green Belt	100% loss
	Dust Suppression	100% loss (from RWH)
Total Waste Water		0.6 (Septic tank/soak pit)
Total Fresh Water from Borewell		2 KLD

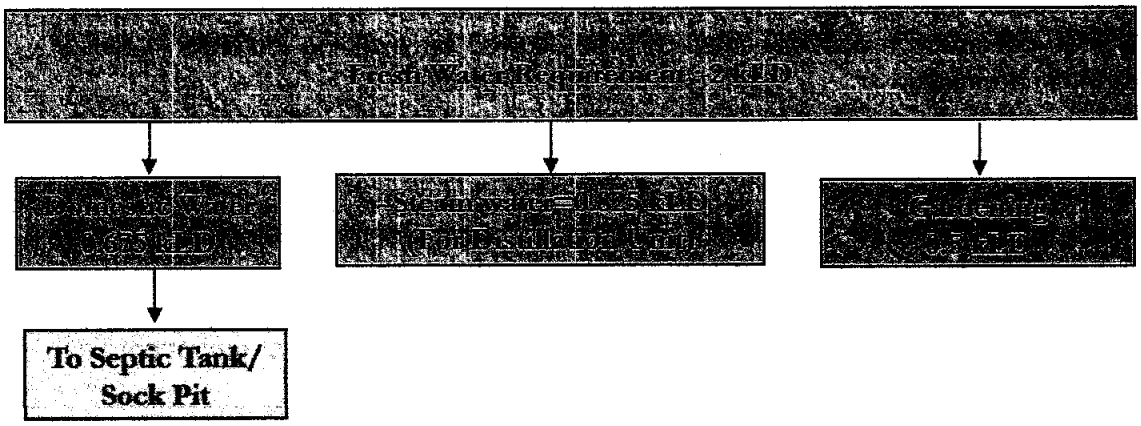


Figure 10.1: Water Balance Diagram

10.4.2 Air Environment

The baseline ambient air quality monitoring carried out during study period of 1st March to 31st May 2022 of 10 Km study area. The study clearly reveals that the concentrations of $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO within the study area are well within the prescribed limits as per the National Ambient Air Quality Standards. The major sources of air emissions from the proposed projects include non-pointsources emissions and point source emissions.

The project proponent shall take care of the pollution generated from the proposed expansion and use appropriate methods of control like:

- Control at source for minimizing air pollution.
- Greenbelt development around the estate to reduce odor and noise pollution
- Regular maintenance of machineries and equipment.

During Construction Phase:

Potential sources of air pollution during construction of additional facility at process area, storage area are (i) dust emissions due to vehicle movement and (ii) exhaust emissions from diesel generators, construction equipment and vehicles. Moreover, Construction phase will be for a short period and hence the impacts will also be for a short and temporary period. The impact on air quality during construction phase will be minimized by adopting following mitigation measures:

- Dust suppression by regularly spraying water on roads and work sites shall be practiced.
- Wetting or covering stockpiles, the proper location of material stockpiles and covering loaded trucks during the transportation of material shall be ensured.
- Separate civil construction material storage yard will be created within the site and it will be enclosed.
- Use of low-emission vehicles and, wherever feasible, construction equipment powered by electricity shall be preferred.
- Maintenance of engines and use of vehicles with PUC Certificates. Contractors will be required to strictly implement these measures.
- DG sets equipped with stack of adequate height.
- Engines of idle vehicle machineries/equipment not in use, shall be turned off.
- All construction workers will be provided appropriate Personal Protective Equipment (PPEs) like dust mask, ear plug, helmet, safety belt etc. and made to wear them during working hours.

- Regular inspection for proper implementation of mitigation measures shall be done.

During Operation Phase:

The air pollutants in the plant may be classified broadly into particulate matter like dust, fumes etc. and gases like Sulphur dioxide, carbon mono oxide, nitrogen oxide etc. The measure to control the air pollution will ensure the ambient air quality standards as laid down by Central Pollution Control Board for industrial areas. The system proposed for air pollution control will provide acceptable environment condition in the working areas and abate air pollution in the surrounding area of the plant. The technological equipment and processes have been selected with the above objectives. Depending on quality of emission from different sources, suitable air pollution control system will be provided. The chimney height will be as per CPCB norms to ensure ground level concentration of different pollutants within permissible limit. Following measures are proposed to mitigate negative impact of operation phase of the project on the surrounding air environment:

- Each and Every process emission will be passed through Wet Scrubber (Two stage water followed by Alkali Scrubber) and finally released in to atmosphere through adequately designed stack height.
- Height of all the stacks will be as per statutory requirement. All the stacks will have Stack Monitoring Facility (SMF) consisting of sampling port-hole, platform and access ladder.
- Online monitoring system for the pollutants from the stacks with an arrangement to reflect gaseous emission parameters on company's server shall be provided.
- Transport vehicles will be properly maintained to reduce air emissions.
- Vehicles will be periodically checked for pollutant emissions against stipulated norms.
- Idle running of vehicles will be minimized during material loading / unloading operations.
- Water sprinkling along the haul road
- Proper maintenance air pollution control equipment
- Regular maintenance of vehicles and machinery in order to control emissions
- A good housekeeping and proper maintenance will be practiced in the industry.

EMP for Air:

During Construction Phase:

Source	Control Measures
Flue Gas Emission 1) PM 2) SOX 3) NOX	DG Set- Stack height of 11 m (emergency use)
Fugitive Gas Emission 1) Dust Emission	Regular Water Sprinkling

During Operation Phase:

Source	Control Measures
Flue Gas Emission 4) PM 5) SOX 6) NOX	TFH- Stack height of 30 m Multi Cyclone & Dust Collection System (Bag Filter)
Fugitive Gas Emission Dust Emission	Regular Water Sprinkling

Process Gas Emission 1) VOC 2) HC	Venturi Scrubber

10.4.3 Solid / Hazardous Waste Management

All the solid/hazardous wastes to be generated at the end of manufacturing process or waste treatment process will be stored on impervious floor having roof, boundary wall and leachate collection as well as transfer facility. Management of wastes shall be done as per Hazardous and other waste (Management and Trans-boundary Movement), Rules 2016 of Environment Protection Act, 1986. Solid/hazardous waste generated from plant is mentioned below

Table 10.2: Solid/hazardous Waste Generation & Management

S.No.	Name	Category	Quantity	Disposal/ Management
Solid Waste				
1.	Fly Ash	-	50 TPA	Collection, Storage, Transportation, Disposal by selling to brick manufacturer.
Hazardous Waste				
3.	Used Oil	5.1	0.2 TPA	Collection, Storage, Transportation, Disposal by selling to register refiners

10.4.4 Noise Management

Noise generation from production activities and plant equipment/machineries will be confined within plant boundary. As discussed in chapter — 4, there will be no significant impacts on noise environment due to the proposed project. Noise level within the plant premises will be measured regularly and will try to maintain range within permissible limit.

However, following is the management plan to minimize/eliminate any noise impacts:

- Acoustic enclosures wherever possible will be provided for abatement of noise fromequipment/machineries in plant.
- Silencers or mufflers, anti-vibrating pads will be provided.
- PPE like ear muffs, ear plug will be provided to worker who works near noise area.
- Utmost care will be taken at the time of equipment/machinery installation to prevent noiseand vibration.
- Greenbelt area will be developed as per proposed project requirement.
- Strict instruction to all the vehicles entering in plant premises not to blow horn unnecessarilyand exceed the speed limit.

Details of expected aspect due to proposed activities in the project and its management plan aregiven in **Table 10.3.**

Table 10.3: Environmental Management Plan

S. No.	Aspects due to proposed activity	Impact zones	Management plan	Responsibility
Air Environment				

1.	Dust generation	Transportation	➢ Regular sprinkling	EHS In-charge/ EHS team
2.	PM10 emissions due to operation of DG set	DG set	➢ Exhaust is connected to stack attached to acidulation ➢ Ensured continuous ➢ Monitoring SPM concentration as per consent norms	
	PM_{10} emission due to operation of TFH and distillation process		➢ Stack of 30m for TFH ➢ Ensure monitoring of stack for SPM concentrations as per regulatory norms	
	Emission of SO_2, NO_x and PM_{10} during operation of DG set		➢ Stack of adequate heightwill be provided ➢ Ensuring DG set to meet ➢ emission standards	
	Transportation activities during construction and operation phase		➢ Transportation of raw materials and finished goods will be carried out in well closed tanker ➢ Traffic Management Plan will be made and followed ➢ Records will be maintained for entry and exit of vehicles	
Water Environment				
1	Sewage generation due to Influx of workers during construction and Operation phase	Within plant premises	➢ Sewage will be treated into Septic Tank/soak pit	Design Head

2	Consumption of water foroperation of plant	Fresh water reserv oir	➢ Online flow meters shall be installed at each of raw water consumption point. ➢ The fresh water demands ➢ will be reduced by recycling and reuse of water	EHS In-charge/ EHS team
Land Environment				
1	Generation of ash fromoperation of Hot AirFurnace	Within plant premis e	➢ Solid waste will be sold to brick manufacturers	EHS In-charge/ EHS team
2	Generation of scraps during construction and operation phase	Within plant premis e	➢ Ensuring that solid wasteis handled as per Solid Waste Management Rule, 2016 and sold to registered and authorized vendors	EHS In-charge/ EHS team
Noise Environment				
1	Noise due to Transportation of raw material and finished goods	Within site and transp ort route	➢ Valid PUC vehicles will be ensured during construction and operation phase.	EHS In-charge/ EHS team
Risk and Hazards				
1	Emergency preparedness	Within site	➢ Fire protection and safety measures to be taken ➢ Safety training to avoidaccidents ➢ Mock drill records, on site emergency and ➢ evacuation plan	EHS In-charge/ EHS team

10.5 OCCUPATIONAL HEALTH & SAFETY

Occupational Health & Safety (OHS) is an area concerned with the safety, health and welfare of persons engaged in the manufacturing of specialty chemicals. Main aim of occupational safety and health plan is to foster a safe and healthy work environment, which may also protect co-workers,

family members, employers, customers, and many others who might be affected by the workplace environment. It is important to the company for moral, legal, and financial reasons. Implementation of good OHS practices can also reduce employee injury and illness related costs, including medical care, sick leave and disability benefit costs. Personal protective equipment such as safety shoes, safety goggles, hand gloves, gum boots and safety helmet will be given to all workers & staff. Additional PPEs will be readily available at the workplace as and when required. The following key safety measures will be a part of the health & safety policy of the company and will be followed after the commissioning of the project.

- Safety training will be provided to the employees.
- Safety sirens with alarm system in case of emergency will be provided & maintained.
- Emergency control room will be established.
- Assembly point will be provided at appropriate location.
- Firefighting facilities, Fire hydrant system will be installed with fire hydrant posts.
- Fire Extinguishers will be provided at designated area as per requirement.
- Firefighting network including fire extinguishers, fire hydrant system etc. covering entire proposed facilities will be provided.
- Mock drills will be conducted periodically and factors like response time will be evaluated.
- Fire squad team will be formed for handling any emergency situation & regular training of squad team will be conducted.
- First Aid Facility and training will be provided to employees.
- Personnel protective gears and equipment will be provided to the employees.
- Health check-ups will be organized at regular intervals.
- Safety/ Health records and MSDS will be maintained.
- On site – Off site emergency plan will prepare.
- Periodic medical check-ups will be carried out for staff personnel as per guidelines & records will be maintained.
- Safety awareness programs will be conducted regularly for workers and contractors associated with the industry.
- Emergency control room will be established,
- First aid boxes at appropriate place.
- Proponent will make provision for employing an industrial hygienist for monitoring of the occupational injury and maintain the record of the same as per requirement of Factories Rules.
- All firefighting equipment and warning devices will be kept in perfect working conditions at all the times. It will be seen that all personnel are aware of the implications of environmental pollution and simple practices to avoid pollution
- All safety and health precaution will be taken, although workplace monitoring for VOC, etc. is suggested to identify any adverse health effect on workers.

Housekeeping

- Proper housekeeping is an essential part of sound environmental management. It will be rigorously seen that there is no accumulation of wastes, especially combustible wastes inside the plant area. Regular maintenance of greenbelt area will help to reduce to dusting and noise level around the plant.

Management has listed some of the Do's & Don'ts activities to strengthen the **SAFETY AT WORK**, which will be followed strictly:

For Preventive Maintenance

Do's:

- Inspection of Storage Area, Earthing and Bonding system.
- Inspection of all Fire Fighting Facilities /Check Alarms operation.
- Ensuring that operators/workers etc. follows the SOPs, Safety procedures & standards, work permit system etc.
- Make sure existing fire extinguishers are fully charged and ready for action.
- Inspections of plant, machinery, tools, equipment, premises, work practices, processes, procedures and general environment must be carried out for the health and safety of plant, people and surrounding.
- On-site and Offsite Emergency Plans shall be reviewed and updated, as per the requirement.

Don'ts:

- Don't allow anyone who hasn't received specific safety and operational training to get indulge in any site activity.
- Don't perform your own maintenance.
- Don't compromise on Design and Engineering part.
- Don't perform any activity without proper permit.
- Don't panic if you are in a risky situation.
- Don't allow spilled chemicals to drain to sewers/gutters etc.

Strengthening of HSE (Applicable for Manufacturing Utility Staff)

Do's:

- Follow instructions. Do not take chances. If you don't know, ask.
- Correct or report unsafe conditions.
- Include a timeline for completion of each recommendation.
- Make recommendations that are measurable and trackable.
- Ensure that each recommendation is assigned to an individual to oversee implementation.
- Help keep things clean and orderly.
- Do not horseplay. Do not run. Avoid distracting others. Avoid throwing things.
- Report all injuries. Get first aid promptly.
- Use, adjust and repair equipment only, when authorized.
- Use right tools & equipment for the job, use them safely.
- Do not smoke in restricted areas. Do not flick cigarette / beedi in company.
- Use prescribed protective equipment; keep them in good working conditions.
- Respect signs / warnings. Abide by rules laid down for your safety.

Don'ts:

No worker in a factory-

- Shall willfully interfere with or misuse any appliance, convenience or other thing provided in the factory for the purpose of securing the Health, Safety or Welfare of the workers therein:

- Shall willfully and without reasonable cause do anything likely to endanger himself or others;
- Shall willfully neglect to make use of any appliance or other thing provided in the factory for the purposes of securing the Health or Safety of the workers therein.

Shall make vague statements, overrule supervisor, adopt shortcuts.

10.6 CORPORATE ENVIRONMENTAL RESPONSIBILITY

CER is linked to sustainability and mainly based on the social and environmental consequences. Prayagraj Impex LLPwill focus on education, health care, environment area and following activities will be covered in CER plan. The major problem of this area is drinking water and health condition; hence installation of drinking water facility in Ghasera Village will be done. The cost will be 4.00 Lakhs under CER head.

Table 10.4 Provision of CER Activity and Tentative Budget

CER Activities	Cost (Lakhs)
Infrastructure Facility for Drinking Water in Bajarka and Ghasera Village	4.0
Total	4.0

10.7 GREEN BELT DEVELOPMENT

Greenbelt development is most effective pollution control measure for air and noise pollution as it acts as barrier to particulate matter, gaseous pollutant and noise propagation. Greenbelt area proves to be an ideal place for diversified flora and fauna and it will improve air quality within plot premises adding to the aesthetic beauty of the proposed plant.

Company proposes to develop Greenbelt area on 33% of the total land *i.e.* 2145 m^2. The company will develop green belt along the periphery of the landfill site & proposed facilities in the plot premises after consultation with horticulture expert. Domestic species suitable for the local climatic conditions, perennial and evergreen trees, Air pollution resistive plants shall be considered to be planted in the proposed greenbelt area.

The following points will be considered for selection of plants species:

- Greenbelt absorbs both gaseous as well as particulate pollutants to a great extent. For absorbance of gases, the duration of the foliage should be longer.
- Characteristics of tree/plants including shapes of crowns considered necessary for effective removal of dust particles.
- Greenbelt/Plant species having good root system will be selected, so that soil erosion rates can be controlled significantly.

Proposed green belt area will comprise rows of varying trees height belonging to native species with thick foliage, along the periphery of the unit. Approx. 537 nos. of trees and 200 nos. of shrubs will be planted within the within one year. Rs. 2 Lakhs /annum shall be allocated as total recurring cost including greenbelt maintenance.

Table 10-5: Recommended Plant Species for Greenbelt Development

Plant Species	Habit	Tolerance Limit	Stomatal Index	Mode of Regeneration
Acacia auriculiformis	Tree	T	10.9	Seeds
Azadirachta indica	Tree	T	29.2	Seeds
Bougainvillea spectabilis	Shrub	T	32.53	Cutting
Delonix regia	Tree	S	14.38	Seeds / stem cutting
Ficus religiosa	Tree	T	18.70	Stem cutting / Seeds
Ficus bengalensis	Tree	T	21.72	Stem cutting / Seeds
Hibiscus rosa-sinensis	Shrub	T	23.2	Stem cutting
Nerium indicum	Shrub	T	15.7	Cutting
Polyathia longifolia	Tree	S	22.27	Seeds
Syzygium cumini	Tree	T	20.60	Seed, cutting, grafting, budding
Terminalia catapppa	Tree	T	20.9	Seeds
Thespesia populneoides	Tree	T	29.81	Seeds/ cutting

Unit will develop greenbelt area as per CPCB guidelines. Approx. 2145 m^2 area will be developed with in the factory premises as greenbelt area.

Following activities shall be carried out for maintaining the greenbelt area,

- Annual planning for tree plantation with specific number of trees to be planted shall be made. The fulfillment of the plan will be monitored by the EMC every six months
- A plan for post plantation care will be reviewed in the monthly meetings. Any abnormal death rate of planted trees shall be investigated and acted upon immediately
- Watering of the plants, weeding, hoeing will be carried out for minimum 3 years

10.8 ODOR CONTROL PLAN

Odor control for solid handling

- All solid raw materials will be charged directly to reactor through special air lock hopper against slight negative pressure (in water column) so that no odour is emitted to the environment
- Solid charging nozzle in reactor will be projected inside so that it directly falls in to the solvent media, thereby eliminating carrying over of solid to vapour nozzle

- Powder transfer system will also be used where ever applicable to have zero loss of powder into the atmosphere.

Odor control for liquid handling

- All liquid raw material handled in drum will be cooled down during summer before charging so as to minimize its vapour pressure and control of odour
- Liquid from drums will be charged in day tank or to reactor with the help of FLP motorized barrel pump. Alternatively vacuum lock could also be used in day tank for transfer of liquid from drum (pumping under vacuum). Day tank vent shall be connected to fume gas scrubber
- Little or partial handling area is equipped with suction hood which finally connect with fume scrubber
- A portable duct connection shall the mounted-on drum vent nozzle to exhaust fume while opening lid of the drum

In addition to above following common practices shall be followed to control any odor from plant.

Regular monitoring of work area by supervisors
Source control of odors emanating from plants
Sufficient Ventilation shall be provided in all plants as per Haryana factory Rules.
Provision of exhaust fan for air circulation and odor dilution with the ambient air

10.9 RESOURCE CONSERVATION

Rain Water Harvesting (RWH)

Rain Water can be harvested either storing in containers for ready use or charged into soil for withdrawal later *i.e.* ground water recharging. Company has decided to installed Rain Water Harvesting system to prevent runoff and to help reduce fresh water consumption. Storm water network will be designed throughout the site for collection of roof top as well as internal runoff during the monsoon season. Pipeline and storm water drainage will be connected/ diverted to water harvesting area without any contamination or after removing impurities *i.e.* leaves, floating materials, birds drop out *etc.* The main elements of rain water harvesting systems are catchments, conduits and storage facility either above the ground or under the ground.

During rainy season, the rain water will be collected from roofs in collection tank having an adequate capacity and the collected water will be used for industrial activities. The normal annual rainfall in Mewat district is about 594 mm spread over 31 days. The south west monsoon sets in the last week of June and withdraws towards the end of September and contributes about 75% of the annual rainfall. July and August are the wettest months. 25% of the annual rainfall occurs during the non-monsoon months in the wake of thunder storms and western disturbances.

Average 31 rainy days and following basic details have been worked for designing the Rain Water Harvesting System:

Average Rainfall: 594 mm (Source - http://cgwb.gov.in/district_profile/haryana/mewat.pdf)

Roof top area available for rain water harvesting: 2470 m^2

Rain Water that can be harvested: (2470) * (0.59) * (0.8) = 1173.7 m^3

Paved area available for rain water harvesting: 1885 m^2

Rain Water that can be harvested: (1885) * (0.59) * (0.5) = 559.8 m^3

Green Belt area available for rain water harvesting: 2145 m^2

Rain Water that can be harvested :(2145) * (0.59) * (0.3) = 382.2 m^3

Total Rain Water that can be harvested in Monsoon season = 2115.7 m^3

A 50 KL capacity Rain water harvesting tank provision has been provided at site, the rain water will be utilized for green belt irrigation, dust suppression, floor washing etc.

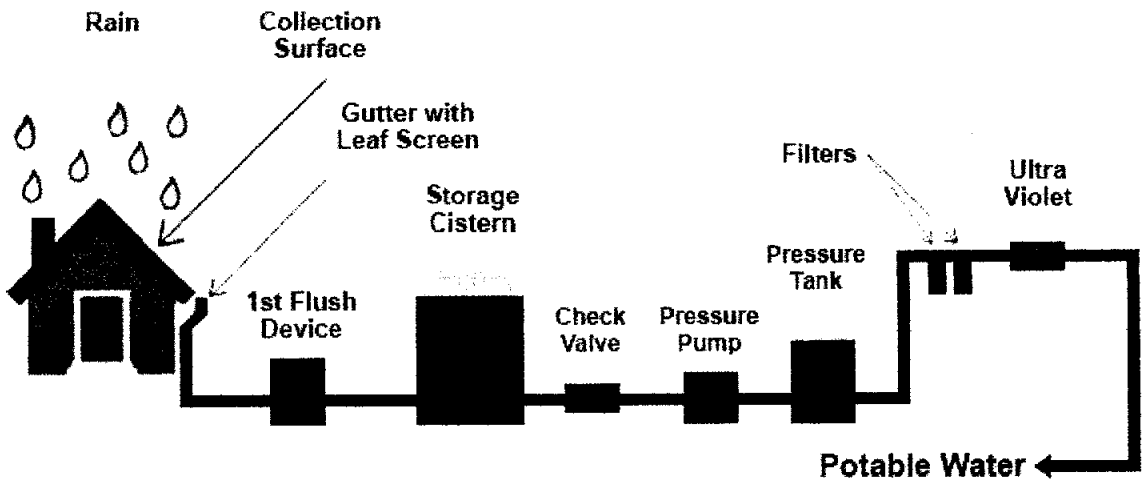


Figure 10.2: Typical Rain Water Harvesting diagram

The effectiveness of the drainage system depends on proper cleaning of drainage pipes/channels *etc.* Regular checking before & during the monsoon will be done to see that none of the drains/drainage facilities are clogged and are efficient to collect the rainwater under rain water harvesting program. The clogged drains will be cleaned up immediately on report of any clogging or blockage. This checking and cleaning will be meticulous during the monsoon season, especially if heavy rains are forecasted.

10.9.1 Energy Conservation

Company will provide solar lights within plant premises; also, will design building structures in such way that there will be maximum use of natural light during day time.

10.9.2 Strom Water Drain Network

Internal Storm water drain with adequate slope around the plot will be provided.

10.10 BUDGET FOR EMS

Capital cost of EMS estimates based on cost of wastewater treatment facility, air pollution control equipment, waste management facility, greenbelt development & management plan, safety measures and other components of the EMP will be implemented along with the commissioning of the proposed project. The budgetary provision made for environmental management is briefly illustrated in the table below.

Table 7-6: Capital and Recurring Cost of EMS

S. No.	Particulars	Capital Cost (Rs. In Crore)	Recurring Cost (Rs. in Lakhs/Annum)
1.	Air Pollution	3.25	2.5
2.	Water Pollution	7.0	3.5
3.	Occupational Health and Safety	5.0	7.5
4.	Solid waste disposal and Management	1.0	2.0
5.	Green belt development & maintenance	1.75	2.0
6.	Online Monitoring System	7.0	2.5
7.	DCS	9.00	2.0
8.	Misc (Compliances)	1.0	5.00
	Total	**35.00**	**27.0**

Total Rs. 35.00 Lakhs/annum is allocated for Environmental control measures/ Environmental management system. To achieve the prescribed norms for water, air and waste it is necessary to operate the EMS regularly. Following are estimate of recurring expenses for environmental issues and EMS.

10.11 ENVIRONMENT MANAGEMENT CELL

To facilitate the Environment Management System, one of the most important aspects is the organization and personnel. The unit shall form an Environment Management Cell for achievement of the following:

- Collect information from regular monitoring and create a database.
- Analyze the data and decide the critical areas for immediate attention and corrective actions.
- Work out action plan for implementation of the recommendations made under Environment Management Plan.
- Prepare budget for environment management program and proper allocation of the funds for the same.

Qualified and experienced person in the field of Environment either environmental engineer or environmental scientist will be appointed for overall responsibility for the management of all the issues related to Environment, Health and Safety within the plant. In consultation with in charge of the plant, he will directly report to the Senior Management of the company for issues related to the Environment Management System of the unit. The organogram is given below and the flow of information will be upright from the EHS Manager (Environment Engineer to Partner) for any non-compliances during operation phase.

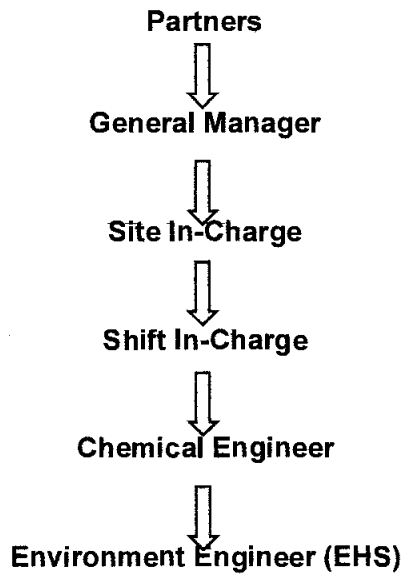


Figure 10-3: Organogram of the Environment Management Cell (EMC)

EMC Team will be responsible for the following:

- Overall effective and regular operation of Environment Management System at the plant level.
- Effective implementation of the suggested environmental monitoring program at the plant level. Measurement of various parameters suggested in environmental monitoring program as per suggested schedule either departmentally or through appointing an external agency,
- To control the pollution levels below the prescribed limits.
- To rectify the problem areas in the EMS, if any and provide necessary assistance in the form of replacement of any equipment or by improving performance of the same.
- To ensure compliance with the stipulated statutory standards & norms as well as condition of statutory clearances & approval like EC and CC&A.

10.12 SUMMARY

The main purpose of EMP is to minimize the identified potential environmental impacts to be generated from the proposed project and to mitigate the consequences. During construction phase materials will be transported through covered trucks. Green belt will be developed to reduce noise impacts. Construction activities will be carried out during day time only. Regular water sprinkling will do to reduce PM concentration in the atmosphere. PPEs will be provided to workers and first aid facilities shall be kept at designated locations during construction phase. During operation phase the industry will maintain comprehensive environment management plan in place for the proposed unit which shall covers all the environment protection measures to mitigate improvised environmental impact. Adequate stack will be provided to the re-boiler. M/s Prayagraj Impex LLP proposes to develop 2145 m^2 (33%) greenbelt area of total land *i.e.*, 6500 m^2 the company will develop green belt along the periphery of the plant site and in common premises available outside the company premises after consultation with horticulture expert. Approx. 737 Nos. of trees and varieties of local shrubs will be planted. Rs. 2.00 Lakhs/annum is been allocated as recurring cost for greenbelt maintenance. Total Rs. 35 Lakhs is allocated for Environmental control measures/Environmental management plan. Capital cost of EMP estimates based on cost of wastewater treatment facility, air pollution control equipment, waste management facility, greenbelt development & management plan, safety measures and other components of the EMP shall be implemented along with the commissioning of the proposed project.

11.SUMMARY AND CONCLUSION

11.1 General

Proposed Fractional Distillation Plant of Petroleum Crude and mixed hydrocarbons at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107 by M/s Prayagraj Impex. Project activities fall under schedule 5 (e) category "A" of EIA Notification, 2006. There is no any litigation pending against the project and/or land on which the project will proposed to be set up. EIA study has been conducted prior to commissioning of project and in accordance with the ToR from MoEFCC on 1st June 2022.

11.2. PROJECT DESCRIPTION

The proposed project lies in Latitude: 28.123767º and Longitude: 77.082495º. The ToR has been granted on 1st June 2022. Invest Rs. 2 Crores as capital cost of project. National Park/ Wildlife sanctuary/ Marine sanctuary/ Reserve Forest is not located within 10 kms radius of proposed project. Total water consumption will be 2 KLD. Power requirement 180 KVA electricity will be sourced from HSEB and for emergency DG Set will be available. LDO, HSD will be used as fuel and sourced from local supplier. 15 Nos. of manpower including contractor workers will be employed during operation phase. No trade effluent envisaged, the water reused back in to the process, hence proposed project is Zero Liquid Discharge (ZLD) unit. Adequate size and No. of APC (Cyclone Separator, Bag filter, Ventury Scrubber) will be provided to achieve the statutory norms.

11.3 DESCRIPTION OF THE ENVIRONMENT

Table 11-1: Summary of Baseline Status Details

S. No.	Parameters	Baseline Status
1.	**Ambient Air Quality**	**(µg/m³)**
i.	PM_{10}	79.42-94.13
ii.	$PM_{2.5}$	39.66-53.96
iii.	SO_2	11.89-14.52
iv.	NO_2	21.04-24.73
v.	CO	0.57-0.81
All results have been found within the NAAQ Standard Limit		
2.	**Noise Level Monitoring**	**(dB(A))**
i.	Day Time (06:00 AM to 10:00 PM)	46.1-57.4
ii.	Night Time (10:00 PM to06:00 AM)	35.4-48.1
The observed noise levels are meeting the acceptable norms		
3.	**Soil Quality and Characteristics**	**(mg/kg)**
i.	pH	7.11-7.51
ii.	Organic Matter (%)	0.61-1.56
iii.	Total Nitrogen (%)	0.063-0.09
iv.	Total Phosphorous	51.65-77.86
v.	Available Calcium	3205.41-4549.55
vi.	Available Magnesium	389.18-577.45
4.	**Ground Water**	**(mg/L)**
i.	pH	7.98-8.31

S. No.	Parameters	Baseline Status
ii.	TDS	1411-1786
iii.	Total Hardness	403-760
iv.	Total Alkalinity	213-512
5.	**Surface Water**	**(mg/L)**
i.	pH	7.36-8.16
ii.	TDS	251-435
iii.	DO	7.4
iv.	BOD	8- 10.30

Ecology: The most commonly spotted bird species of this area is Pigeon, Sparrow, Parrot etc. All the birds are included in schedule IV. Among the reptiles' home lizard was common. Among mammals' cow, rat is common. There is a good population of schedule-II species. Dominant flora of the study region like Neem, Amaltas, Mango, etc. are common. Natural vegetation of study area is in good condition and wild mammal 's density is also very low. No endangered or threatened species were observed during the survey.

Socio Economy: Most of the population are depended upon farming. Drinking Water facility and sanitization is very poor.

11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impacts on land environment, air environment, water environment, noise environment, biological environment, socioeconomic environment and risk and hazard is been introduced in the chapter with their mitigation measures for both during construction as well as operation phase. Matrix study and its representation has also been carried out and briefed in chapter. Total cumulative score for various Environmental Parameters without mitigation measures is -165 during construction phase which is adverse impact. Total cumulative score for various Environmental Parameters with mitigation measure is +16 with appreciable beneficial impact during operation phase. Air modeling study is also been introduced in the chapter showing maximum and minimum GLC in the surrounding areas. Proper upkeep and maintenance of vehicles and APCD will reduce the impact on air environment. Unit will develop more than 33% of greenbelt within the premises. Positive impact is envisaged on Socio economic environment. Proper PPEs will be provided to all the workers. From the impact matrix table, it is observed that without mitigation measures the scoring of operation phase is -254. After taking adequate mitigation measures impact reduces to -27, which is a not an appreciable adverse impact. it can be concluded that the overall negative impacts from various activities on different environmental parameters is negligible with proper EMP in place

11.5 ANALYSIS OF ALTERNATIVES

Three alternative sites have been considered, and site#1 selected for proposed Fractional Distillation plant of Petroleum Crude and mixed Hydrocarbon at KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107 by Prayagraj Impex LLP. The total plot area is 6500 m^2 which is industrial land.

11.6 ENVIRONMENTAL MONITORING PROGRAM

The environment monitoring for the proposed greenfield Fractional Distillation plant operation will be conducted asfollows:

- Ambient Air quality;

- Water and wastewater quality;
- Ambient Noise levels;
- Soil Quality;
- Greenbelt Development;
- CER/CSR;
- Occupational Health Surveillance.

Monitoring of important and crucial environment parameters is of immense importance to assess the status of environment during operation of fractional Distillation of petroleum crude by M/s Prayagraj Impex LLP will formulate the Environmental Management Cell. The EMC shall be responsible for all activities. All environment monitoring and relevant operational data will be storedin a relational database. Regular data extracts and interpretive reports will be sent to the regulator.

11.7 ADDITIONAL STUDIES

Additional studies include Identification of hazards in the proposed project activity is of primary significance. Qualitative and Quantitative both risk has been analyzed. Risk Assessment and hazard identification and control measures of the same have been carried out. M/s Prayagraj Impex LLP has developed an emergency preparedness plan and Disaster Management Plan after 3D risk assessment. Fire alarm panel (electrical) will cover the entire plant. The Environmental Management Cell (EMC) will handle of all the related activities such as collection of statistics of health of workers and population of the region, afforestation and green belt development. The fire protection system for the unit will be provide for early detection, alarm, containment and suppression of fires. The Occupational Health Centre with adequate facilities will available at plant site to maintained round the clock by a compounder cum dresser and a doctor. Medical Personnel/Medical Doctor will be available at site for emergency relief. First aid kit will be provided. Appropriatepersonal protective equipment will be provided to all workmen as and when required. All records of On-Site and Off-Site Emergency Plan shall be well maintained and preserved.

11.8 ENVIRONMENTAL MANAGEMENT PLAN

The main purpose of EMP of Fractional Distillation Plant of Petroleum Crude is to minimize the identified potential environmental impacts to be generated from the proposed project and to mitigate the consequences. During construction phase materials will be transported through covered trucks. Green belt will be developed to reduce noise impacts. Construction activities will be carried out during day time only. Regular water sprinkling will do to reduce PM concentration in the atmosphere. PPEs will be provided to workers and first aid facilities shall be kept at designated locations during construction phase. Prayagraj Impex LLP proposes to develop 2145 m^2 (33%) greenbelt area of total land *i.e.*, 6500 m^2 the company will develop green belt along the periphery of the plant site and in common premises available outside the company premises after consultation with horticulture expert. Approx. 737 Nos. of trees and varieties of local shrubs will be planted. Total Rs. 35 Lakhs is allocated for Environmental control measures/Environmental management plan. Capital cost of EMP estimates based on cost of wastewater treatment facility, air pollution control equipment, waste management facility, greenbelt development & management plan, safety measures and other components of the EMP shall be implemented along with the commissioning of the proposed project

11.9 CONCLUSION

Proposed greenfield project is located in Haryana would not have any considerable impact on environment with efficient mitigation measures implemented. The waste generation in form of gas (flue and process), effluent and solid waste may have impacts on environmental parameters but the

proponent has planned and installed most efficient technologies for preventionof emission and treatment of effluent. Further, the solid/hazardous waste will be disposed-off separately. Hence there would not be any considerable impacts on environment. With the implementation of the mitigation measures and EMP, the proposed project activities will have positive beneficial effect on the local population, economic output and other related facilities *viz.* employment, development of business, transportation *etc.* Rapid risk assessment & 3 D risk assessment including emergency response plan and DMP has been prepared to handle any sort of emergencies. Hence looking to the overall project justification, process, pollution potential and pollution preventionmeasures /technologies installed by proponent, environmental management activities of proponent; it has been concluded that the proposed project would not have any considerable impacts on environment as well as socio-economic and ecological conditions of the project area. Hence proposed project is considered environmentally safe.

12 DISCLOSURE OF CONSULTANTS

12.1 GENERAL

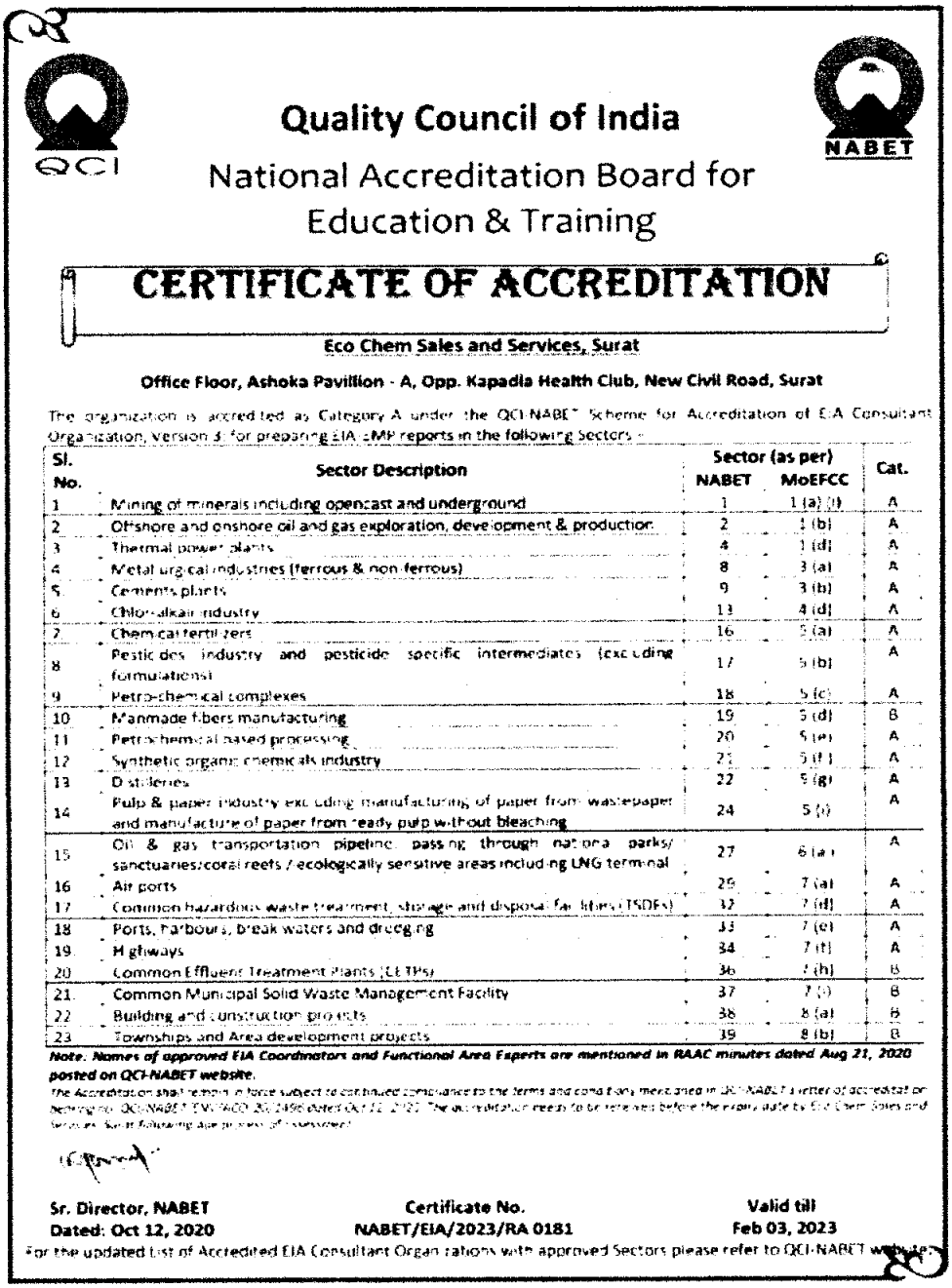
ECO CHEM SALES & SERVICES (ECSS) is one of the leading companies in the field of Environmental Consultancy Service providers in India. We are NABET Accredited consultant for conducting Environmental Impact Assessment Studies (EIA) and obtaining Environmental Clearances. We also take up services which include and are not limited to Environment Monitoring & Testing, Environment Audit, Risk Assessment Studies, Turnkey solutions, Operation and Maintenance contracts and obtaining various statutory clearances from Ministry of Environment, Forest and Climate Change (MoEF&CC) and State Pollution Control Boards. ECSS also has branch offices in Vapi, Dahej and Vadodara, Gujarat. The ECSS have accreditation from NABET/QCI for in Category A with certificate number NABET/EIA/2023/RA 0181 valid till 23rd Feb. 2023.

12.2 EIA TEAM MEMBERS

Table 12-1: Team Members involved in the EIA

Name	Activity / Area	Involvement – Actual Work Performed
Mr. Ramdas A Wani	EIA Coordinator	Project planning; Guidance in writing & modification in Contents; Review of EIA report
Dr. Ashok K. Rathoure & Mrs. Snehali Dutta	EIA Report writing	Coordination for data collection, data analysis, coordination with FAEs, team members; compiling the primary & secondary data for EIA report; EIA/EMP report preparation
Mr. Ramdas A Wani	Air Pollution Monitoring, Prevention & Control (AP)	Identification of monitoring locations, coordination with laboratory for baseline Air Quality Monitoring results
Mr. Ramdas A Wani	Air Quality Modeling AQ	Micro-meteorological data, inventorization, air modeling, prediction of GLC & mitigation measures
Mr. Dhaval Shah	Land use (LU)	Site visit; coordination for data collection and data analysis; map preparation & report writing
Mrs. Rekha Shah	Water Pollution, Prevention and Control (WP)	Identification of water sampling stations; identification of impacts and relevant mitigation measures; preparation of management plan and report writing
Mr. Ramdas A Wani	Solid & Hazardous Waste Management (SHW)	Identifying solid/hazardous waste generation sources; waste generation calculation; preparation of waste disposal plan; report writing.
Mr. Ramdas A Wani	Risk & Hazard (RH)	Preparation of RA and DMP, report writing for occupational health & safety.
Mr. Vinay S Patil	Ecology & Biodiversity (EB)	Identification of floral and faunal species; EB report preparation.
Mrs Dipti H Patel	Noise & Vibration (NV)	Noise impact prediction, traffic study, LOS of road
Dr. B.K. Patel	Soil Conservation (SC)	Interpretation, impact prediction on soil
Mr. Ghanshyam Patel	Socio-Economics (SE)	Conducting Survey, FGD, Data collection, Need base assessment, report preparation
Mr. Ravikant Sharma	Geology (GEO)	Impact prediction based on secondary data.
Mrs. Rekha Shah	Hydrology (HG)	Impact prediction based on secondary data.

12.3 NABET (QCI) CERTIFICATE OF ACO



Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

Eco Chem Sales and Services, Surat

Office Floor, Ashoka Pavillion - A, Opp. Kapadia Health Club, New Civil Road, Surat

The organization is accredited as Category A under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, version 3 for preparing EIA -EMP reports in the following Sectors :

Sl. No.	Sector Description	Sector (as per) NABET	Sector (as per) MoEFCC	Cat.
1	Mining of minerals including opencast and underground	1	1 (a) (i)	A
2	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3	Thermal power plants	4	1 (d)	A
4	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
5	Cement plants	9	3 (b)	A
6	Chlor-alkali industry	13	4 (d)	A
7	Chemical fertilizers	16	5 (a)	A
8	Pesticides industry and pesticide specific intermediates (excluding formulations)	17	5 (b)	A
9	Petro-chemical complexes	18	5 (c)	A
10	Manmade fibers manufacturing	19	5 (d)	B
11	Petrochemical based processing	20	5 (e)	A
12	Synthetic organic chemicals industry	21	5 (f)	A
13	Distilleries	22	5 (g)	A
14	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	24	5 (j)	A
15	Oil & gas transportation pipeline passing through national parks/ sanctuaries/coral reefs / ecologically sensitive areas including LNG terminal	27	6 (a)	A
16	Air ports	29	7 (a)	A
17	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	32	7 (d)	A
18	Ports, harbours, break waters and dredging	33	7 (e)	A
19	Highways	34	7 (f)	A
20	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
21	Common Municipal Solid Waste Management Facility	37	7 (i)	B
22	Building and construction projects	38	8 (a)	B
23	Townships and Area development projects	39	8 (b)	B

Note. Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Aug 21, 2020 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO 20/2456 dated Oct 12, 2020. The accreditation needs to be renewed before the expiry date by Eco Chem Sales and Services, Surat following due process of submission.

Sr. Director, NABET | **Certificate No.** | **Valid till**

Dated: Oct 12, 2020 | **NABET/EIA/2023/RA 0181** | **Feb 03, 2023**

For the updated list of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

12.4 LABORATORY

ENVIRO-TECH SERVICES laboratory [NABL accredited Laboratory (T-8771)] valid up to 25/12/2023 for testing of water, air, noise and soil. The laboratory is also recognized by MoEFCC, New Delhi. Certificate shown on next page.

2287076/2022/Estt.Br

National Accreditation Board for Testing and Calibration Laboratories

NABL

CERTIFICATE OF ACCREDITATION

ENVIRO-TECH SERVICES

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

PLOT NO 1/32SOUTH SIDE G T ROAD INDUSTRIAL AREA, GHAZIABAD, UTTAR PRADESH, INDIA

in the field of

TESTING

Certificate Number: TC-8771

Issue Date: 26/12/2021 Valid Until: 25/12/2023

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : ENVIRO-TECH SERVICES

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

2287076/2022/Estt.Br

National Accreditation Board for Testing and Calibration Laboratories

NABL

SCOPE OF ACCREDITATION

Laboratory Name :	ENVIRO-TECH SERVICES, PLOT NO 1/32 SOUTH SIDE G T ROAD INDUSTRIAL AREA, GHAZIABAD, UTTAR PRADESH, INDIA		
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S.No	Discipline / Group	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of tests performed	Test Method Specification against which tests are performed and / or the techniques / equipment used
Permanent Facility				
1	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Ammonia,(NH3)	IS 5182 (Part-25):
2	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Dust Fall	IS 5182 (Part-1)
3	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Lead,(Pb)	IS 5182 (Part-22)
4	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Nitrogen Dioxide,(NO2)	IS: 5182 (Partt-6)
5	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Ozone,(O3)	IS: 5182 (Partt.-9)
6	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Particulate Matters,(PM10)	IS 5182 (Part-23)
7	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Particulate Matters,(PM2.5)	IS 5182 (Part-24):
8	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Air	Sulphur Dioxide, (SO2)	IS: 5182 (Part-2)
9	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Noise Level (Excluding Vibration)	Indoor Noise Level	I5: 9876:1981
10	CHEMICAL- ATMOSPHERIC POLLUTION	Ambient Noise Level (Excluding Vibration)	Ambient Noise Level	IS: 9989:2001
11	CHEMICAL- ATMOSPHERIC POLLUTION	Fugitive Emission	Nitrogen Dioxide,(NO2)	IS 5182 (Part-6)
12	CHEMICAL- ATMOSPHERIC POLLUTION	Fugitive Emission	Particulate Matters,(PM10)	IS 5182 (Part-23)
13	CHEMICAL- ATMOSPHERIC POLLUTION	Fugitive Emission	Sulphur Dioxide,(SO2)	IS 5182 (Part-2)
14	CHEMICAL- ATMOSPHERIC POLLUTION	Source Noise Level (Excluding Vibration) Particular Sources To Be Specified	DG Noise Level	IS: 9876:1981
15	CHEMICAL- ATMOSPHERIC POLLUTION	Source Noise Level (Excluding Vibration) Particular Sources To Be Specified	Machines Noise Level	IS 4758 -1968
16	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Ammonia,(NH3)	IS-11255 (Part-6)
17	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Carbon Dioxide,(CO2)	IS: 13270
18	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Carbon Monoxide,(CO)	IS: 13270

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19	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Flouride(F)	IS 11255 PART-5;
20	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Lead,(Pb)	USEPA 6010D
21	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Nickel,(Ni)	USEPA 6010D
22	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Oxide of Nitrogen,(NOX as NO2)	IS-11255 (Part-7)
23	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Oxygen,(O2)	IS: 13270
24	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Particulate Matters,(PM)	IS-11255 (Part-1)
25	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Sulphur Dioxide,(SO2)	IS-11255 (Pt-2)
26	CHEMICAL- ATMOSPHERIC POLLUTION	Stack Emissions	Zinc,(Zn)	USEPA 6010D
27	CHEMICAL- ATMOSPHERIC POLLUTION	Work Environmental And Indoor Air Quality	Relative Humidity,(RH)	ETS/STP/AIR-13
28	CHEMICAL- ATMOSPHERIC POLLUTION	Work Environmental And Indoor Air Quality	Room Temperature	ETS/STP/AIR-13
29	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Alcoholic (Cordials, Wine, Grape Spirit, Brandy, Rum, Vodka, Gin, Beer, Whisky, Spirit Distillate, Ena, Tequila, extra neutral alcohol)	Ash Content	IS 3752 :2005
30	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Alcoholic (Cordials, Wine, Grape Spirit, Brandy, Rum, Vodka, Gin, Beer, Whisky, Spirit Distillate, Ena, Tequila, extra neutral alcohol)	Ethyl Alcohol Content	FSSAI, Manual of Methods of Analysis Of Foods, Alcoholic Beverages, FSSAI 13.001.2021 Page-3, FSSAI 13.002.2021,Page-04
31	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Alcoholic (Cordials, Wine, Grape Spirit, Brandy, Rum, Vodka, Gin, Beer, Whisky, Spirit Distillate, Ena, Tequila, extra neutral alcohol)	Fixed Acidity	IS 3752 :2005
32	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Alcoholic (Cordials, Wine, Grape Spirit, Brandy, Rum, Vodka, Gin, Beer, Whisky, Spirit Distillate, Ena, Tequila, extra neutral alcohol)	Furfural	FSSAI, Manual of Methods of Analysis Of Foods, Alcoholic Beverages, FSSAI 13.021.2021 Page-35
33	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Alcoholic (Cordials, Wine, Grape Spirit, Brandy, Rum, Vodka, Gin, Beer, Whisky, Spirit Distillate, Ena, Tequila, extra neutral alcohol)	Higher Alcohols As Amyl Alcohol	FSSAI, Manual of Methods of Analysis Of Foods, Alcoholic Beverages, FSSAI 13.013.2021 Page-24

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S.No	Discipline / Group	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of tests performed	Test Method Specification against which tests are performed and / or the techniques / equipment used
34	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Alcoholic (Cordials, Wine, Grape Spirit, Brandy, Rum, Vodka, Gin, Beer, Whisky, Spirit Distillate, Ena, Tequila, extra neutral alcohol)	Methyl Alcohol	FSSAi, Manual of Methods of Analysis Of Foods, Alcoholic Beverages, FSSAI 13.027.2021 Page-48
35	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Alcoholic (Cordials, Wine, Grape Spirit, Brandy, Rum, Vodka, Gin, Beer, Whisky, Spirit Distillate, Ena, Tequila, extra neutral alcohol)	pH @25 °C	IS 3865 :2001
36	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Alcoholic (Cordials, Wine, Grape Spirit, Brandy, Rum, Vodka, Gin, Beer, Whisky, Spirit Distillate, Ena, Tequila, extra neutral alcohol)	Residue On Evaporation	FSSAI, Manual of Methods of Analysis Of Foods, Alcoholic Beverages, FSSAI 13.006.2021 Page-13
37	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Alcoholic (Cordials, Wine, Grape Spirit, Brandy, Rum, Vodka, Gin, Beer, Whisky, Spirit Distillate, Ena, Tequila, extra neutral alcohol)	Total Acidity (As Tartaric Acid)	FSSAI, Manual of Methods of Analysis Of Foods, Alcoholic Beverages, FSSAI 13.008.2021 Page-15
38	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Alcoholic (Cordials, Wine, Grape Spirit, Brandy, Rum, Vodka, Gin, Beer, Whisky, Spirit Distillate, Ena, Tequila, extra neutral alcohol)	Volatile Acidity (Acetic Acid)	FSSAI, Manual of Methods of Analysis Of Foods, Alcoholic Beverages, FSSAI 13.009.2021 Page-16
39	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Asafoetida	Acid Insoluble Ash	FSSAI, Manual of Methods of Analysis Of Foods, Spices and condiments, FSSAI 10.007:2021 page-20
40	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Atta, Maida, Suji, Rawa, corn flour, custard powder	Acid Insoluble Ash	FSSAI, Manual of Methods of Analysis Of Foods, Cereal and Cereal Products, Clause-8.3,Page 16
41	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Atta, Maida, Suji, Rawa, corn flour, custard powder	Alcoholic Acidity	FSSAI, Manual of Methods of Analysis Of Foods, Cereal and Cereal Products,Clause-8.5, Page-18
42	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Atta, Maida, Suji, Rawa, corn flour, custard powder	Calorific Value	IS:14433:2007
43	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Atta, Maida, Suji, Rawa, corn flour, custard powder	Carbohydrates	IS 1656:2007
44	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Atta, Maida, Suji, Rawa, corn flour, custard powder	Gluten	FSSAI, Manual of Methods of Analysis Of Foods, Cereal and Cereal Products,Clause-8.4,Page-17

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S.No	Discipline / Group	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of tests performed	Test Method Specification against which tests are performed and / or the techniques / equipment used
45	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Atta, Maida, Suji, Rawa, corn flour, custard powder	Moisture	FSSAI, Manual of Methods of Analysis Of Foods, Cereal and Cereal Products, Clause-8.1,16.1 Page-13, 47
46	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Atta, Maida, Suji, Rawa, corn flour, custard powder	Protein	FSSAI, Manual of Methods of Analysis Of Foods, Cereal and Cereal Products, Clause-8.7,Page-19
47	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Atta, Maida, Suji, Rawa, corn flour, custard powder	Starch	IS 4706 (Part II):1978
48	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Atta, Maida, Suji, Rawa, corn flour, custard powder	Total Ash Excluding NaCl	FSSAI, Manual of Methods of Analysis Of Foods, Cereal and Cereal Products, Clause-16.2,Page-48
49	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Atta, Maida, Suji, Rawa, corn flour, custard powder	Total Ash	FSSAI, Manual of Methods of Analysis Of Foods, Cereal and Cereal Products, Clause-8.2,Page-14
50	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Acid Insoluble Ash	IS 12711:1989
51	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Acidity Of Extracted Fat	IS 12711:1989
52	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Alcoholic Acidity	IS 12711:1989
53	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Fat	IS 12711:1989
54	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Moisture	IS 12711:1989
55	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Peroxide Value	IS 12711 :1989
56	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	pH @25 °C	IS 12711 :1989

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57	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Reducing Sugar	IS 6287:1985
58	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Starch	IS 4706:1978 (Part II)
59	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Sucrose	IS 6287:1985
60	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Sulphated Ash	IS 6287:1985
61	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Total Ash	IS 12711:1989
62	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Biscuits, cakes, chips, wafers, pastry, brownie, muffin	Total Protein	FSSAI, Manual of Methods of Analysis Of Foods, Cereal and Cereal Products, Clause-8.7,Page-19
63	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Black Tea	Acid Insoluble Ash	IS 13857:1993
64	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Black Tea	Alkalinity Of Water Soluble Ash	IS 13856:1993
65	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Black Tea	Total Ash (Water Soluble)	IS 13855:1993
66	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Black Tea	Total Ash	IS 13854:1994
67	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Black Tea	Water Extract	IS 13862:1999
68	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Caraway, Cardamom, Cinnamon, Cassia, Cumin, Fennel, Fenugreek, Ginger, Mace, Mustard, Nutmeg, Poppy, Aniseed & Ajowan	Total Ash	FSSAI, Manual of Methods of Analysis Of Foods, Spices and condiments, FSSAI 10.006:2021 page- 17
69	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Chillies, Capsicum(Lal Mirchi) – powder and whole	Non-Volatile Ether Extract	FSSAI, Manual of Methods of Analysis Of Foods, Spices and condiments, FSSAI 10.012:2021 page-30

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S.No	Discipline / Group	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of tests performed	Test Method Specification against which tests are performed and / or the techniques / equipment used
70	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Coffee (roasted, ground, Instant & Soluble Coffee Powder)	Acid Insoluble Ash	IS 3077:1992
71	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Coffee (roasted, ground, Instant & Soluble Coffee Powder)	Moisture	IS 3077:1992
72	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Coffee (roasted, ground, Instant & Soluble Coffee Powder)	Solubility in Cold Water	IS 2791:1992
73	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Coffee (roasted, ground, Instant & Soluble Coffee Powder)	Total Ash	IS 3077:1992
74	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Coffee (roasted, ground, Instant & Soluble Coffee Powder)	Total Fat (Petroleum Ether Extract)	IS 3077:1992
75	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Coffee (roasted, ground, Instant & Soluble Coffee Powder)	Water Soluble Ash	IS 3077:1992
76	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Coffee-Chicory mixture & Instant Coffee-Chicory mixture	Solubility In Boiling Water	IS 2791:1992
77	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Corn flakes, Vermicelli, Macaroni	Salt As NaCl	FSSAI, Manual of Methods of Analysis Of Foods, Cereal and Cereal Products, Clause-16.2,Page-48
78	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	corn flakes, vermicelli, macaroni	Total Solids In Gruel	IS 1485:1993
79	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Curry Powder, Mixed Masala powder	Acidity	IS 13242:2018
80	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Frozen Meat and Products	Nitrogen	FSSAI, Manual of Methods of Analysis Of Foods, Meat and Meat Products & Fish and Fish Products, Clause-2.2,Page-39
81	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Frozen Meat and Products	Protein	FSSAI, Manual of Methods of Analysis Of Foods, Meat and Meat Products & Fish and Fish Products, Clause-2.2,Page-38

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82	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Fruit Products - jam, jelly, concentrate, marmalade, nectar, pickle, sauce	Acid Insoluble Ash	FSSAI, Manual of Methods of Analysis Of Foods, Fruit and Vegetable Products, Clause-5.3, Page-35
83	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Fruit Products - jam, jelly, concentrate, marmalade, nectar, pickle, sauce	Acidity	FSSAI, Manual of Methods of Analysis Of Foods, Fruit and Vegetable Products, Clause-2.4,Page-12
84	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Fruit Products - jam, jelly, concentrate, marmalade, nectar, pickle, sauce	Salt As NaCl	FSSAI, Manual of Methods of Analysis Of Foods, Fruit and Vegetable Products, Clause-1.7,Page-9
85	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Fruit Products - jam, jelly, concentrate, marmalade, nectar, pickle, sauce	Sucrose	FSSAI, Manual of Methods of Analysis Of Foods, Fruit and Vegetable Products, Clause-2.6,Page-15
86	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Fruit Products - jam, jelly, concentrate, marmalade, nectar, pickle, sauce	Total Solids	FSSAI, Manual of Methods of Analysis Of Foods, Fruit and Vegetable Products, Clause-13.1,Page-42
87	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Ghee	BR Value	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.009:2021, Page -21
88	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Ghee	FFA	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.009:2021, Page -21
89	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Ghee	Peroxide Value	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.042:2021, Page -91
90	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Ghee	Reichert Meissel (RM Value)	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.011:2021, Page -28
91	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Honey	Acidity	IS 4941:1994
92	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Honey	Fiehe's Test	IS 4941:1994

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93	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Honey	Fructose-Glucose Ratio	IS 4941:1994
94	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Honey	Hydroxy Methyl Furfural (HMF)	IS 4941
95	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Honey	Moisture	IS 4941
96	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Honey	Optical Density	IS 4941
97	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Honey	Specific Gravity At 27 0C	IS 4941
98	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Honey	Sucrose	IS 4941
99	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Honey	Total Ash	IS 4941
100	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Honey	Total Reducing Sugar	IS 4941
101	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	BR Value	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-13.3,Page-110
102	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Cellulose	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-1.2.3,Page-12
103	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Fat	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-1.3.4.1,Page-37

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104	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Moisture	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-3.2,Page-47
105	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	pH @25 °C	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-16.6,Page-140
106	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Phosphates Test	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-1.3.1,Page-32
107	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Protein	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-3.4.1,Page-49
108	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Reichert Meissel (RM Value)	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-13.5,Page-117
109	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Starch	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-1.2.2.1, Page-11
110	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Sucrose	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-9.4.1,Page-71
111	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Titrable Acidity	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-10.4,Page-88
112	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Total Ash	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-10.7,Page-90

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113	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Total Milk Solids	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-4.5,Page-55
114	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Total Nitrogen	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-19.1,Page-166
115	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Total Solids	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-1.3.3,Page-36
116	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Liquid Milk: Raw/Sterilized/Pasteurized/Flavored/Toned/Double Toned/Standardized/ Recombined/Condensed/Sweetened/Full cream/Skimmed/Evaporated/Sweetened Condensed	Urea	FSSAI, Manual of Methods of Analysis Of Foods, Milk and Milk Products, Clause-1.2.4.1, Page-13
117	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Processed Fruit and products	Carbohydrates	IS 1656:2007
118	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Processed Fruit and products	Energy	IS:14433:2007
119	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Processed Fruit and products	pH @25 °C	FSSAI, Manual of Methods of Analysis Of Foods, Fruit and Vegetable Products, Clause-2.3,Page-11
120	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Processed Fruit and products	Reducing Sugar	FSSAI, Manual of Methods of Analysis Of Foods, Fruit and Vegetable Products, Clause-2.6,Page-15
121	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Processed Fruit and products	Total Ash	FSSAI, Manual of Methods of Analysis Of Foods, Fruit and Vegetable Products, Clause-11.3,Page-41
122	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Processed Fruit and products	Total Soluble Solids	FSSAI, Manual of Methods of Analysis Of Foods, Fruit and Vegetable Products, Clause-1.6,Page-4

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123	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Processed Meat and Products	Salt As NaCl	FSSAI, Manual of Methods of Analysis Of Foods, Meat and Meat Products & Fish and Fish Products, Clause-2.3,Page-60
124	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Raw Meat	Acid Insoluble Ash	FSSAI, Manual of Methods of Analysis Of Foods, Meat and Meat Products & Fish and Fish Products, Clause-2.4,Page-61
125	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Raw Meat	Carbohydrates	IS 1656:2007
126	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Raw Meat	Moisture	FSSAI, Manual of Methods of Analysis Of Foods, Meat and Meat Products & Fish and Fish Products, Clause-2.2,Page-59
127	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Raw Meat	Total Fat	FSSAI, Manual of Methods of Analysis Of Foods, Meat and Meat Products & Fish and Fish Products, Clause-2.1,Page-38
128	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Turmeric (Powdered and finger)	Chromate Test	FSSAI, Manual of Methods of Analysis Of Foods, Spices and condiments, FSSAI 10.033:2021, Page -77
129	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Turmeric (Powdered and finger)	Curcurmin Content	FSSAI, Manual of Methods of Analysis Of Foods, Spices and condiments, FSSAI 10.030:2021, Page -69
130	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Vegetable Oils	Acid Value	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.009:2021, Page -21
131	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Vegetable Oils	Insoluble Impurities	IS 548:1964 (Part-1)
132	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Vegetable Oils	Iodine Value	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats,FSSAI 02.010:2021, Page -24
133	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Vegetable Oils	Moisture	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.001:2021, Page -3

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134	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Vegetable Oils	Polensky Value	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.011:2021, Page -28
135	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Vegetable Oils	Refractive Index At 40 0C	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.003:2021, Page -6
136	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Vegetable Oils	Saponification Value	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.007:2021, Page -16
137	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Vegetable Oils	Specific Gravity @ 30 0C	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.002:2021, Page -4
138	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Vegetable Oils	Un- Saponifiable Matter	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.008:2021, Page -18
139	CHEMICAL- FOOD & AGRICULTURAL PRODUCTS	Vegetable Oils	Volatile Matter	FSSAI, Manual of Methods of Analysis Of Foods, Oils and Fats, FSSAI 02.001:2021, Page -3
140	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Chloride,(Cl)	BS 1377 -3
141	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Organic Carbon,(OC)	BS 1377 -3
142	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Phosphorus Pentoxied (P2O5)	BS 1377 -3
143	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Phosphorus (PO4)	ETS/STP/SOIL-19
144	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Sodium Absorption Ratio (SAR)	ETS/STP/SOIL-16
145	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Sodium,(Na)	ETS/STP/SOIL-06
146	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Sulphate (SD4)	IS 2720 (Part-27)
147	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Total Nitrogen (N)	APHA,4500:(N org)-B

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148	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Organic Matter,(OM)	IS 2720 (Part-22)
149	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	pH (1:10 Suspension)	IS 2720 (Part-26)
150	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Total Soluble Solids	IS 2720 (Part-21)
151	CHEMICAL- POLLUTION & ENVIRONMENT	CLAYS AND SOIL	Cadmium,(Cd)	EPA-3050A
152	CHEMICAL- POLLUTION & ENVIRONMENT	CLAYS AND SOIL	Chromium,(Cr)	EPA-3050A
153	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Calcium,(Ca)	IS 2720 (Part-23)
154	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Iron,(Fe)	EPA-3050A
155	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE (LIQUID / SLURRY/SLUDGE/SOLID/SEMI-SOLID)	Potassium (K)	USEPA-3050A;
156	CHEMICAL- POLLUTION & ENVIRONMENT	WASTE WATER (EFFLUENT /SEWAGE)	Phosphate (P)	APHA,Pt 4500:(P)-D
157	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	Biological Oxygen Demand, (BOD3 day ,at 27 0C)	IS: 3025 (Part-44)
158	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	Chemical Oxygen Demand , (COD)	APHA,5220-C
159	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	Dissolved Oxygen(DO)	APHA,4500:(O)-C
160	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	pH @25 °C	APHA,4500-H+
161	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	Phenolic Compound,(C6H5OH)	APHA,4500:(P)-D
162	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	Total Dissolved Solids,(TDS)	APHA,2540-C
163	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	Total Suspended Solids,(TSS)	APHA,2540-D
164	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	Ammonia,(as Total NH3-N)	APHA,4500:(NH3)-C
165	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	Ammonical Nitrogen (NH3)	APHA,4500:(NH3)-F
166	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	Biological Oxygen Demand, (BOD5 day ,at 20 0C)	APHA,5210-C

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167	CHEMICAL- POLLUTION & ENVIRONMENT	Waste Water (Effluents / Sewage)	Oil & Grease, (O & G)	APHA,5520-D:
168	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Boron,(B)	APHA 4500:(B)-C
169	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Chromium,(Cr+6)	APHA 3500:(Cr)-B
170	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Aluminium,(Al)	APHA-3120B
171	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Arsenic,(As)	APHA 3120B
172	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Barium,(Ba)	APHA 3120B
173	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Beryllium,(Be)	APHA 3120B
174	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Cadmium,(Cd)	APHA 3120B
175	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Chromium,(Cr)	APHA-3120B
176	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Cobalt,(Co)	APHA-3120B
177	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Copper,(Cu)	APHA 3120B
178	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Iron,(Fe)	APHA-3120B
179	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Lead,(Pb)	APHA-3120B
180	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Lithium,(Li)	APHA-3120B
181	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Manganese,(Mn)	APHA-3120B
182	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Mercury,(Hg)	US EPA Method 200.7
183	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Molybdenum,(Mo)	APHA-3120B
184	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Nickel,(Ni)	APHA-3120B
185	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Phenolic Compound,(C6H5OH)	APHA 5530-C:

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186	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Potassium,(K)	APHA-3120B
187	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Selenium,(Se)	APHA-3120B
188	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Silver,(Ag)	APHA-3120B
189	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Sodium,(Na)	APHA-3120B
190	CHEMICAL- RESIDUES IN WATER	DRINKING WATER	Zinc,(Zn)	APHA-3120B
191	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Boron,(B)	APHA 4500:(B)-C
192	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Chromium,(Cr+6)	APHA 3500:(Cr)-B
193	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Aluminium,(Al)	APHA 3120B
194	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Arsenic,(As)	APHA 3120B
195	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Barium,(Ba)	APHA 3120B
196	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Beryllium,(Be)	APHA 3120B
197	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Cadmium,(Cd)	APHA 3120B
198	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Chromium,(Cr)	APHA 3120B
199	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Cobalt,(Co)	APHA 3120B
200	CHEMICAL- RESIDUES IN WATER	GRDUND WATER	Copper,(Cu)	APHA 3120B
201	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Iron,(Fe)	APHA 3120B
202	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Lead,(Pb)	APHA 3120B
203	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Lithium,(Li)	APHA 3120B
204	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Manganese,(Mn)	APHA 3120B

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205	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Mercury,(Hg)	US EPA Method 200.7
206	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Molybdenum,(Mo)	APHA 3120B
207	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Nickel,(Ni)	APHA 3120B
208	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Phenolic Compound,(C6H5OH)	APHA 5530-C:
209	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Potassium,(K)	APHA 3120B
210	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Selenium,(Se)	APHA 3120B
211	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Silver,(Ag)	APHA 3120B
212	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Sodium,(Na)	APHA 3120B
213	CHEMICAL- RESIDUES IN WATER	GROUND WATER	Zinc,(Zn)	APHA 3120B
214	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Antimony (Sb)	APHA 3500-Sb
215	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Boron,(B)	APHA 4500:(B)-C
216	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Aluminium,(Al)	APHA 3120B
217	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Arsenic,(As)	APHA 3120B
218	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Barium,(Ba)	APHA 3120B
219	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Beryllium,(Be)	APHA 3120B
220	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Cadmium,(Cd)	APHA 3120B
221	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Chromium,(Cr)	APHA 3120B
222	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Cobalt,(Co)	APHA 3120B
223	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Copper,(Cu)	APHA 3120B

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224	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Iron,(Fe)	APHA 3120B
225	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Lead,(Pb)	APHA 3120B
226	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Lithium,(Li)	APHA 3120B
227	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Manganese,(Mn)	APHA 3120B
228	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Mercury,(Hg)	US EPA Method 200.7
229	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Molybdenum,(Mo)	APHA 3120B
230	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Nickel,(Ni)	APHA 3120B
231	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Phenolic Compound,(C6H5OH)	APHA 5530-C:
232	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Potassium,(K)	APHA 3120B
233	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Selenium,(Se)	APHA 3120B
234	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Silver,(Ag)	APHA 3120B
235	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Sodium,(Na)	APHA 3120B
236	CHEMICAL- RESIDUES IN WATER	PACKAGED DRINKING WATER	Zinc,(Zn)	APHA 3120B
237	CHEMICAL- RESIDUES IN WATER	SWIMMING POOL WATER	Chromium,(Cr+6)	APHA 3500:(Cr)-B
238	CHEMICAL- WATER	CONSTRUCTION WATER	pH @25 °C	APHA 4500-H+
239	CHEMICAL- WATER	CONSTRUCTION WATER	Acidity	APHA 2310-B
240	CHEMICAL- WATER	CONSTRUCTION WATER	Chloride,(Cl)	APHA 4500:(Cl-)-B
241	CHEMICAL- WATER	CONSTRUCTION WATER	Sulphate,(SO4)	APHA 4500:(SO4)-E
242	CHEMICAL- WATER	CONSTRUCTION WATER	Total Alkalinity,(CaCO3)	APHA 2320-B
243	CHEMICAL- WATER	CONSTRUCTION WATER	Total Suspended Solids,(TSS)	APHA,2540-D
244	CHEMICAL- WATER	DIALYSIS WATER	Calcium,(Ca)	APHA 3500:(Ca)-B
245	CHEMICAL- WATER	DIALYSIS WATER	Chloride,(Cl)	APHA 4500:(Cl-)-B

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National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : ENVIRO-TECH SERVICES, PLOT NO 1/32 SOUTH SIDE G T ROAD INDUSTRIAL AREA, GHAZIABAD, UTTAR PRADESH, INDIA

Accreditation Standard ISO/IEC 17025:2017

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S.No	Discipline / Group	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of tests performed	Test Method Specification against which tests are performed and / or the techniques / equipment used
246	CHEMICAL- WATER	DIALYSIS WATER	Nitrate,(NO3-)	APHA 4500:(NO3-)-B
247	CHEMICAL- WATER	DIALYSIS WATER	Total Dissolved Solids,(TDS)	APHA 2540-C
248	CHEMICAL- WATER	DIALYSIS WATER	Total Hardness,(CaCO3)	APHA 2340-C
249	CHEMICAL- WATER	DIALYSIS WATER	pH @25 °C	APHA 4500-H+
250	CHEMICAL- WATER	DIALYSIS WATER	pH @25 °C	APHA 4500-H+
251	CHEMICAL- WATER	DRINKING WATER	Dissolved CO2	APHA 4500(CO2)-D
252	CHEMICAL- WATER	DRINKING WATER	Bicarbonates (as CaCO3)	APHA 4500(CO2)-D
253	CHEMICAL- WATER	DRINKING WATER	Calcium,(Ca)	APHA 3500:(Ca)-B
254	CHEMICAL- WATER	DRINKING WATER	Carbonates (as CaCO3)	APHA 4500(CO2)-D
255	CHEMICAL- WATER	DRINKING WATER	Chloride,(Cl)	APHA 4500:(Cl-)-B
256	CHEMICAL- WATER	DRINKING WATER	Colour	APHA 2120-B
257	CHEMICAL- WATER	DRINKING WATER	Conductivity	APHA 2510-B
258	CHEMICAL- WATER	DRINKING WATER	Fixed Solids,(FS)	APHA 2540-E
259	CHEMICAL- WATER	DRINKING WATER	Magnesium,(Mg)	APHA 3500:(Mg)-B
260	CHEMICAL- WATER	DRINKING WATER	Nitrate,(NO3)	APHA 4500:(NO3-)-B
261	CHEMICAL- WATER	DRINKING WATER	Nitrite,(NO2-)	APHA 4500:(NO2-)-B
262	CHEMICAL- WATER	DRINKING WATER	Odour	APHA 2150-B
263	CHEMICAL- WATER	DRINKING WATER	pH @25 °C	APHA 4500-H+
264	CHEMICAL- WATER	DRINKING WATER	pH @25 °C	APHA 4500-H+
265	CHEMICAL- WATER	DRINKING WATER	Phosphorus (P)	APHA 4500:(P)-D
266	CHEMICAL- WATER	DRINKING WATER	Sulphate,(SO4)	APHA 4500:(SO4)-E
267	CHEMICAL- WATER	DRINKING WATER	Sulphide,(S)	APHA 4500:(S2-)-D
268	CHEMICAL- WATER	DRINKING WATER	Taste	APHA 2160-C
269	CHEMICAL- WATER	DRINKING WATER	Temperature	APHA 2550-B
270	CHEMICAL- WATER	DRINKING WATER	Total Alkalinity,(CaCO3)	APHA 2320-B
271	CHEMICAL- WATER	DRINKING WATER	Total Dissolved Solids,(TDS)	APHA 2540-C
272	CHEMICAL- WATER	DRINKING WATER	Total Hardness,(CaCO3)	APHA 2340-C
273	CHEMICAL- WATER	DRINKING WATER	Total Solids,(TS)	APHA 2540-B
274	CHEMICAL- WATER	DRINKING WATER	Total Suspended Solids,(TSS)	APHA 2540-D
275	CHEMICAL- WATER	DRINKING WATER	Turbidity	APHA 2130-B

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National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

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276	CHEMICAL- WATER	DRINKING WATER	Turbidity	APHA 2130-B
277	CHEMICAL- WATER	DRINKING WATER	Chlorine (Residual)	APHA 4500:(Cl)-B
278	CHEMICAL- WATER	DRINKING WATER	Fluoride,(F)	APHA 4500:(F-)-D
279	CHEMICAL- WATER	GROUND WATER	Conductivity	APHA 2510-B
280	CHEMICAL- WATER	GROUND WATER	Bicarbonates (as CaCO3)	APHA 4500(CO2)-D
281	CHEMICAL- WATER	GROUND WATER	Calcium,(Ca)	APHA 3500:(Ca)-B
282	CHEMICAL- WATER	GROUND WATER	Carbonates (as CaCO3)	APHA 4500(CO2)-D
283	CHEMICAL- WATER	GROUND WATER	Chloride,(Cl)	APHA 4500:(Cl-)-B
284	CHEMICAL- WATER	GROUND WATER	Chlorine (Residual)	APHA 4500:(Cl)-B
285	CHEMICAL- WATER	GROUND WATER	Colour	APHA 2120-B
286	CHEMICAL- WATER	GROUND WATER	Dissolved CO2	APHA 4500(CO2)-D
287	CHEMICAL- WATER	GROUND WATER	Fluoride,(F)	APHA 4500:(F-)-D
288	CHEMICAL- WATER	GROUND WATER	Nitrate,(NO3-)	APHA 4500:(NO3-)-B
289	CHEMICAL- WATER	GROUND WATER	Nitrite,(NO2-)	APHA 4500:(NO2-)-B
290	CHEMICAL- WATER	GROUND WATER	Odour	APHA 2150-B
291	CHEMICAL- WATER	GROUND WATER	pH @25 °C	APHA 4500-H+
292	CHEMICAL- WATER	GROUND WATER	Phosphorus (P)	APHA 4500:(P)-D
293	CHEMICAL- WATER	GROUND WATER	Sulphate,(SO4)	APHA 4500:(SO4)-E
294	CHEMICAL- WATER	GROUND WATER	Sulphide,(S)	APHA 4500:(S2-)-D
295	CHEMICAL- WATER	GROUND WATER	Taste	APHA 2160-C
296	CHEMICAL- WATER	GROUND WATER	Total Alkalinity,(CaCO3)	APHA 2320-B
297	CHEMICAL- WATER	GROUND WATER	Total Dissolved Solids,(TDS)	APHA 2540-C
298	CHEMICAL- WATER	GROUND WATER	Total Hardness,(CaCO3)	APHA 2340-C
299	CHEMICAL- WATER	GROUND WATER	Total Kjeidahl Nitrogen (Organic)	APHA 4500:(N org)-B
300	CHEMICAL- WATER	GROUND WATER	Total Suspended Solids,(TSS)	APHA 2540-D
301	CHEMICAL- WATER	GROUND WATER	Turbidity	APHA 2130-B
302	CHEMICAL- WATER	GROUND WATER	Ammonia,(as Total NH3-N)	APHA 4500:(NH3)-C
303	CHEMICAL- WATER	GROUND WATER	Ammonical Nitrogen (NH3)	APHA 4500:(NH3)-F
304	CHEMICAL- WATER	GROUND WATER	Dissolved Oxygen(DO)	APHA 4500:(O)-C
305	CHEMICAL- WATER	Ground Water	Mineral Oil	IS 3025 (Part-39):

National Accreditation Board for Testing and Calibration Laboratories

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SCOPE OF ACCREDITATION

Laboratory Name :	ENVIRO-TECH SERVICES, PLOT NO 1/32 SOUTH SIDE G T ROAD INDUSTRIAL AREA, GHAZIABAD, UTTAR PRADESH, INDIA		
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306	CHEMICAL- WATER	INDUSTRIAL WATER	Calcium,(Ca)	APHA 3500:(Ca)-B
307	CHEMICAL- WATER	INDUSTRIAL WATER	Chloride,(Cl)	APHA 4500:(Cl-)-B
308	CHEMICAL- WATER	INDUSTRIAL WATER	Conductivity	APHA 2510-B
309	CHEMICAL- WATER	INDUSTRIAL WATER	pH @25 °C	APHA 4500-H+
310	CHEMICAL- WATER	INDUSTRIAL WATER	pH @25 °C	APHA 4500-H+
311	CHEMICAL- WATER	INDUSTRIAL WATER	Total Alkalinity,(CaCO3)	APHA 2320-B
312	CHEMICAL- WATER	INDUSTRIAL WATER	Total Dissolved Solids,(TDS)	APHA 2540-C
313	CHEMICAL- WATER	INDUSTRIAL WATER	Total Hardness,(CaCO3)	APHA 2340-C
314	CHEMICAL- WATER	INDUSTRIAL WATER	Total Suspended Solids,(TSS)	APHA 2540-D
315	CHEMICAL- WATER	INDUSTRIAL WATER	Turbidity	APHA 2130-B
316	CHEMICAL- WATER	IRRIGATION WATER	Biological Oxygen Demand, (BOD3 day ,at 27 0C)	IS 3025 (Part-44)
317	CHEMICAL- WATER	IRRIGATION WATER	Chemical Oxygen Demand , (COD)	APHA 5220-C
318	CHEMICAL- WATER	IRRIGATION WATER	Conductivity	APHA 2510-B
319	CHEMICAL- WATER	IRRIGATION WATER	Nitrate,(NO3)	APHA 4500:(NO3-)-B
320	CHEMICAL- WATER	IRRIGATION WATER	Oil & Grease, (O & G)	APHA 5520-D
321	CHEMICAL- WATER	IRRIGATION WATER	pH @25 °C	APHA 4500-H+
322	CHEMICAL- WATER	IRRIGATION WATER	pH @25 °C	APHA 4500-H+
323	CHEMICAL- WATER	IRRIGATION WATER	Sulphate,(SO4)	APHA 4500:(SO4)-E
324	CHEMICAL- WATER	IRRIGATION WATER	Total Dissolved Solids,(TDS)	APHA 2540-C
325	CHEMICAL- WATER	IRRIGATION WATER	Total Hardness,(CaCO3)	APHA 2340-C
326	CHEMICAL- WATER	IRRIGATION WATER	Turbidity	APHA 2130-B
327	CHEMICAL- WATER	IRRIGATION WATER	Ammonical Nitrogen (NH3)	APHA 4500:(NH3)-F
328	CHEMICAL- WATER	IRRIGATION WATER	Dissolved Oxygen(DO)	APHA 4500:(O)-C
329	CHEMICAL- WATER	PACKAGED DRINKING WATER	Calcium,(Ca)	APHA 3500:(Ca)-B
330	CHEMICAL- WATER	PACKAGED DRINKING WATER	Chloride,(Cl)	APHA 4500:(Cl-)-B
331	CHEMICAL- WATER	PACKAGED DRINKING WATER	Chlorine (Residual)	APHA 4500:(Cl)-B
332	CHEMICAL- WATER	PACKAGED DRINKING WATER	Colour	APHA 2120-B
333	CHEMICAL- WATER	PACKAGED DRINKING WATER	Fluoride,(F)	APHA 4500:(F-)-D
334	CHEMICAL- WATER	PACKAGED DRINKING WATER	Magnesium,(Mg)	APHA 3500:(Mg)-B

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National Accreditation Board for Testing and Calibration Laboratories

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SCOPE OF ACCREDITATION

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335	CHEMICAL- WATER	PACKAGED DRINKING WATER	Nitrate,(NO3-)	APHA 4500:(NO3-)-B
336	CHEMICAL- WATER	PACKAGED DRINKING WATER	Nitrite,(NO2-)	APHA 4500:(NO2-)-B
337	CHEMICAL- WATER	PACKAGED DRINKING WATER	Odour	APHA 2150-B
338	CHEMICAL- WATER	PACKAGED DRINKING WATER	pH @25 °C	APHA 4500-H+
339	CHEMICAL- WATER	PACKAGED DRINKING WATER	pH @25 °C	APHA 4500-H+
340	CHEMICAL- WATER	PACKAGED DRINKING WATER	Sulphate,(SO4)	APHA 4500:(SO4)-E
341	CHEMICAL- WATER	PACKAGED DRINKING WATER	Sulphide,(S)	APHA 4500:(S2-)-D
342	CHEMICAL- WATER	PACKAGED DRINKING WATER	Taste	APHA 2160-C
343	CHEMICAL- WATER	PACKAGED DRINKING WATER	Total Alkalinity,(CaCO3)	APHA 2320-B
344	CHEMICAL- WATER	PACKAGED DRINKING WATER	Total Dissolved Solids,(TDS)	APHA 2540-C
345	CHEMICAL- WATER	PACKAGED DRINKING WATER	Total Hardness,(CaCO3)	APHA 2340-C
346	CHEMICAL- WATER	PACKAGED DRINKING WATER	Turbidity	APHA 2130-B
347	CHEMICAL- WATER	Packaged Drinking Water	Mineral Oil	IS 3025 (Part-39):
348	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Biological Oxygen Demand, (BOD3 day ,at 27 0C)	IS 3025 (Part-44)
349	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Calcium,(Ca)	APHA 3500:(Ca)-B
350	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Chemical Oxygen Demand , (COD)	APHA 5220-C
351	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Chloride,(Cl)	APHA 4500:(Cl-)-B
352	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Conductivity	APHA 2510-B
353	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Dissolved Oxygen(DO)	APHA 4500:(O)-C
354	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Fluoride,(F)	APHA 4500:(F-)-D
355	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Nitrate,(NO3)	APHA 4500:(NO3-)-B
356	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Oil & Grease, (O & G)	APHA 5520-D
357	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Phosphorus (P)	APHA 4500:(P)-D
358	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Sulphate,(SO4)	APHA 4500:(SO4)-E
359	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Total Dissolved Solids,(TDS)	APHA 2540-C
360	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Total Hardness,(CaCO3)	APHA 2340-C
361	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	Turbidity	APHA 2130-B
362	CHEMICAL- WATER	RIVER WATER, SEA WATER, POND WATER & LAKE WATER	pH @25 °C	APHA 4500-H+
363	CHEMICAL- WATER	SWIMMING POOL WATER	Calcium,(Ca)	APHA 3500:(Ca)-B

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National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : ENVIRO-TECH SERVICES, PLOT NO 1/32 SOUTH SIDE G T ROAD INDUSTRIAL AREA, GHAZIABAD, UTTAR PRADESH, INDIA

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364	CHEMICAL- WATER	SWIMMING POOL WATER	Chloride,(Cl)	APHA 4500:(Cl-)-B
365	CHEMICAL- WATER	SWIMMING POOL WATER	Chlorine (Residual)	APHA 4500:(Cl)-B
366	CHEMICAL- WATER	SWIMMING POOL WATER	Conductivity	APHA 2510-B
367	CHEMICAL- WATER	SWIMMING POOL WATER	Nitrate,(NO3)	APHA 4500:(NO3-)-B
368	CHEMICAL- WATER	SWIMMING POOL WATER	pH @25 °C	APHA 4500-H+
369	CHEMICAL- WATER	SWIMMING POOL WATER	Sulphate,(SO4)	APHA 4500:(SO4)-E-)-E
370	CHEMICAL- WATER	SWIMMING POOL WATER	Total Alkalinity,(CaCO3)	APHA 2320-B
371	CHEMICAL- WATER	SWIMMING POOL WATER	Total Dissolved Solids,(TDS)	APHA 2540-C
372	CHEMICAL- WATER	SWIMMING POOL WATER	Total Hardness,(CaCO3)	APHA 2340-C
373	CHEMICAL- WATER	SWIMMING POOL WATER	Turbidity	APHA 2130-B
374	CHEMICAL- WATER	WATER FROM PURIFIERS	Calcium,(Ca)	APHA 3500:(Ca)-B
375	CHEMICAL- WATER	WATER FROM PURIFIERS	Chloride,(Cl)	APHA 4500:(Cl-)-B
376	CHEMICAL- WATER	WATER FROM PURIFIERS	Chlorine (Residual)	APHA 4500:(Cl)-B
377	CHEMICAL- WATER	WATER FROM PURIFIERS	Fluoride,(F)	APHA 4500:(F-)-D
378	CHEMICAL- WATER	WATER FROM PURIFIERS	Nitrite,(NO2-)	APHA 4500:(NO2-)-B
379	CHEMICAL- WATER	WATER FROM PURIFIERS	pH @25 °C	APHA 4500-H+
380	CHEMICAL- WATER	WATER FROM PURIFIERS	Sulphate,(SO4)	APHA 4500:(SO4)-E
381	CHEMICAL- WATER	WATER FROM PURIFIERS	Total Alkalinity,(CaCO3)	APHA 2320-B
382	CHEMICAL- WATER	WATER FROM PURIFIERS	Total Oissolved Solids,(TDS)	APHA 2540-C
383	CHEMICAL- WATER	WATER FROM PURIFIERS	Total Hardness,(CaCO3)	APHA 2340-C

NOTE- The Laboratory has demonstrated competence for the stated scope for WATER. This however does not fully cover the specification requirements of BIS for the Packaged Drinking Water as per IS 14543 and the Packaged Natural Mineral Water IS 13428.

2287076/2022/Estt.Br

No.IA-J-11011/180/2022-IA-II(I)

Goverment of India

Minister of Enviroment,Forest and Climate Change

Impact Assessment Division

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Indira Paryavaran Bhavan,
Vayu Wing,3rd Floor,Aliganj,
Jor Bagh Road,New Delhi-110003
01 Jun 2022

To,

M/s PRAYAGRAJ IMPEX LLP
S/o Ashok Kumar, 56, new anaj mandi, ward 6, Sohana,
Gurgaon-122103
Haryana

Tel.No.--1; Email:prayagrajimpex108@gmail.com

Sir/Madam,

This has reference to the proposal submitted in the Ministry of Environment, Forest and Climate Change to prescribe the Terms of Reference (TOR) for undertaking detailed EIA study for the purpose of obtaining Environmental Clearance in accordance with the provisions of the EIA Notification, 2006. For this purpose, the proponent had submitted online information in the prescribed format (Form-1) along with a Pre-feasibility Report. The details of the proposal are given below:

1. Proposal No.:	IA/HR/IND2/274435/2022
2. Name of the Proposal:	Proposed Petrochemical based processing of 12000 KL/annum by Fractional Distillation of Petroleum Crude & Mixture of Hydrocarbons by M/s Prayagraj Impex LLP
3. Category of the Proposal:	Industrial Projects - 2
4. Project/Activity applied for:	5(e) Petrochemical based processing (processes other than cracking &
5. Date of submission for TOR:	23 May 2022

In this regard, under the provisions of the EIA Notification 2006 as amended, the Standard TOR for the purpose of preparing environment impact assessment report and environment management plan for obtaining prior environment clearance is prescribed with public consultation as follows:

ACTIVITY 5(e)- PETROLEUM PRODUCTS PETROCHEMICAL BASED PROCESSING

SPECIFIC TERMS OF REFERENCE FOR EIA STUDIES FOR PETROCHEMICAL BASED PROCESSING (PROCESSES OTHER THANCRACKING & REFORMATION AND NOT COVERED UNDER THECOMPLEXES)

GENERIC TERMS OF REFERENCE

1) Executive Summary

2) Introduction

i. Details of the EIA Consultant including NABET accreditation

ii. Information about the project proponent

3) Project Description

i. Cost of project and time of completion.

ii. Products with capacities for the proposed project.If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.

iii. List of raw materials required and their source along with mode of transportation.

iv. Other chemicals and materials required with quantities and storage capacities

v. Details of Emission, effluents, hazardous waste generation and their management. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)

vi. Process description along with major equipments and machineries, process flow sheet (quantitative) from raw material to products to be provided.

vii. Hazard identification and details of proposed safety systems.

viii. Expansion/modernization proposals:

a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for

the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the

latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing /existing operation of the project from SPCB shall be attached with the EIA-EMP report.

b. In case the existing project has not obtained environmental clearance, reasons for not

taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.

4) Site Details

i. Location of the project site covering village, Taluka/Tehsil, District and State, Justification forselecting the site, whether other sites were considered.

ii. A toposheet of the study area of radius of 10 km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)

iii. Co-ordinates (lat-long) of all four corners of the site. Google map-Earth downloaded of the project site. Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.

iv. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.

v. Land use break-up of total land of the project site (identified and acquired), government/

private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not

required for industrial area).

vi. A list of major industries with name and type within study area (10km radius) shall be

incorporated.

vii. Details of Drainage of the project up to 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects).

viii. Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.

ix. R&R details in respect of land in line with state Government policy.

5) Forest and wildlife related issues (if applicable):

i. Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)

ii. Land use map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (in case of projects involving forest land more than 40 ha).

iii. Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.

iv. The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon

v. Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State

Government for conservation of Schedule I fauna, if any exists in the study area

vi. Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife.

6) Environmental Status

i. Determination of atmospheric inversion level at the project site and site-specific micrometeorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.

ii. AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.

iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with - min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.

iv. Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.

v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.

vi. Ground water monitoring at minimum at 8 locations shall be included.

vii. Noise levels monitoring at 8 locations within the study area.

viii. Soil Characteristic as per CPCB guidelines.

ix. Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.

x. Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule- I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.

xi. Socio-economic status of the study area.

7) Impact and Environment Management Plan

i Assessment of ground level concentration of pollutants from the stack emission based on site specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modeling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modeling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.
ii. Water Quality modeling - in case of discharge in water body

iii. Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor cum- rail transport shall be examined.

iv. A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules.

v. Details of stack emission and action plan for control of emissions to meet standards.

vi. Measures for fugitive emission control

vii. Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.

viii. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.

ix. Action plan for the green belt development plan in 33 % area i.e. land with not less than1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.

x. Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.

8) Occupational health

i. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers.

ii. Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far &

Near vision, colour vision and any other ocular defect) ECG, during pre placement and periodical examinations give the details of the same. Details regarding last month analyzed data of above mentioned parameters as per age, sex, duration of exposure and department wise.

iii.Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved.

iv. Annual report of heath status of workers with special reference to Occupational Health and Safety.

9) Corporate Environment Policy

i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.

ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.

iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.

iv. Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report.

10) Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labor force during construction as well as to the casual workers including truck drivers during operation phase.

11) Enterprise Social Committment (ESC)

i. Adequate funds (at least 2.5 % of the project cost) shall be ear marked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon.

11) Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details there of and compliance/ATR to the notice(s) and present status of the case.

13) A tabular chart with index for point wise compliance of above TOR.

SPECIFIC CONDITIONS

1. Details on requirement of raw material, its source of supply and storage at the plant.

2. Complete process flow diagram for all products with material balance.

3. Details on requirement of auxiliary chemicals, solvents, catalysts, reactors and utilities to support the unit processes.

4.Brief description of equipments for various process.

5. Details of proposed source- specific pollution control schemes and equipments to meet the national standards.

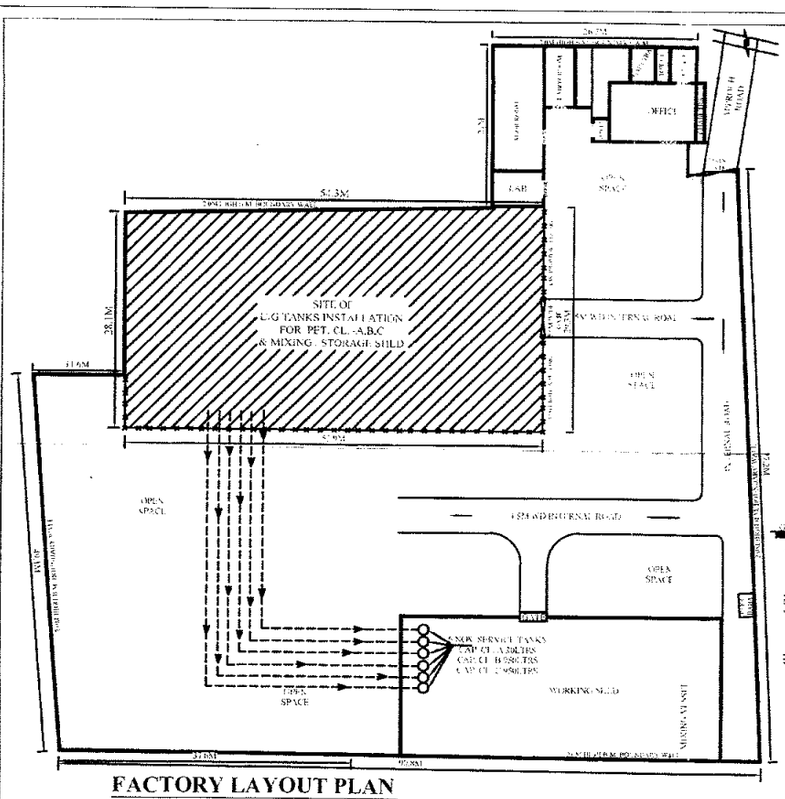
6. Details on VOC emission control system from vents, stacks, fugitive emissions and flare management, etc.

7. Details on proposed LDAR protocol.

8. Ambient air quality should include total hydrocarbon , methane and non methane hydrocarbon & VOC and VCM (if applicable).

9. Risk Assessment & Disaster Management Plan

- Identification of hazards
- Consequence Analysis
- Measures for mitigation of risk.



FACTORY LAYOUT PLAN
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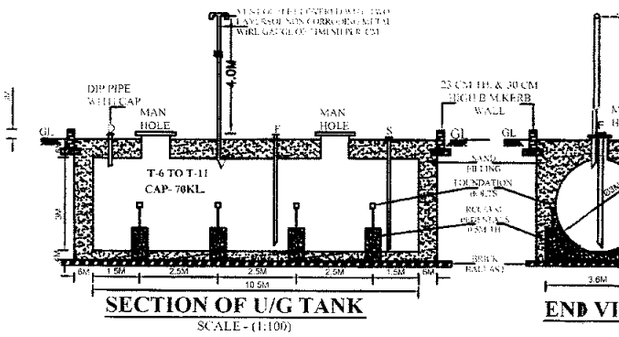

SECTION OF U/G TANK
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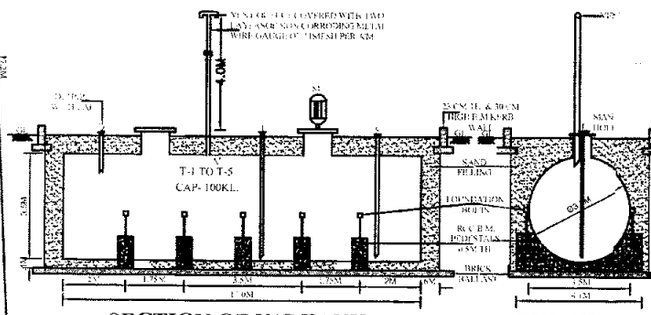
END VI



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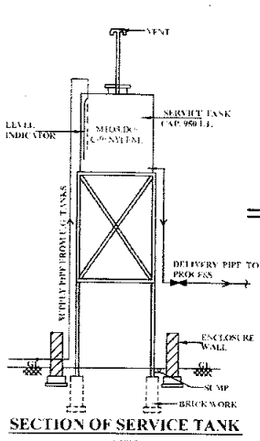
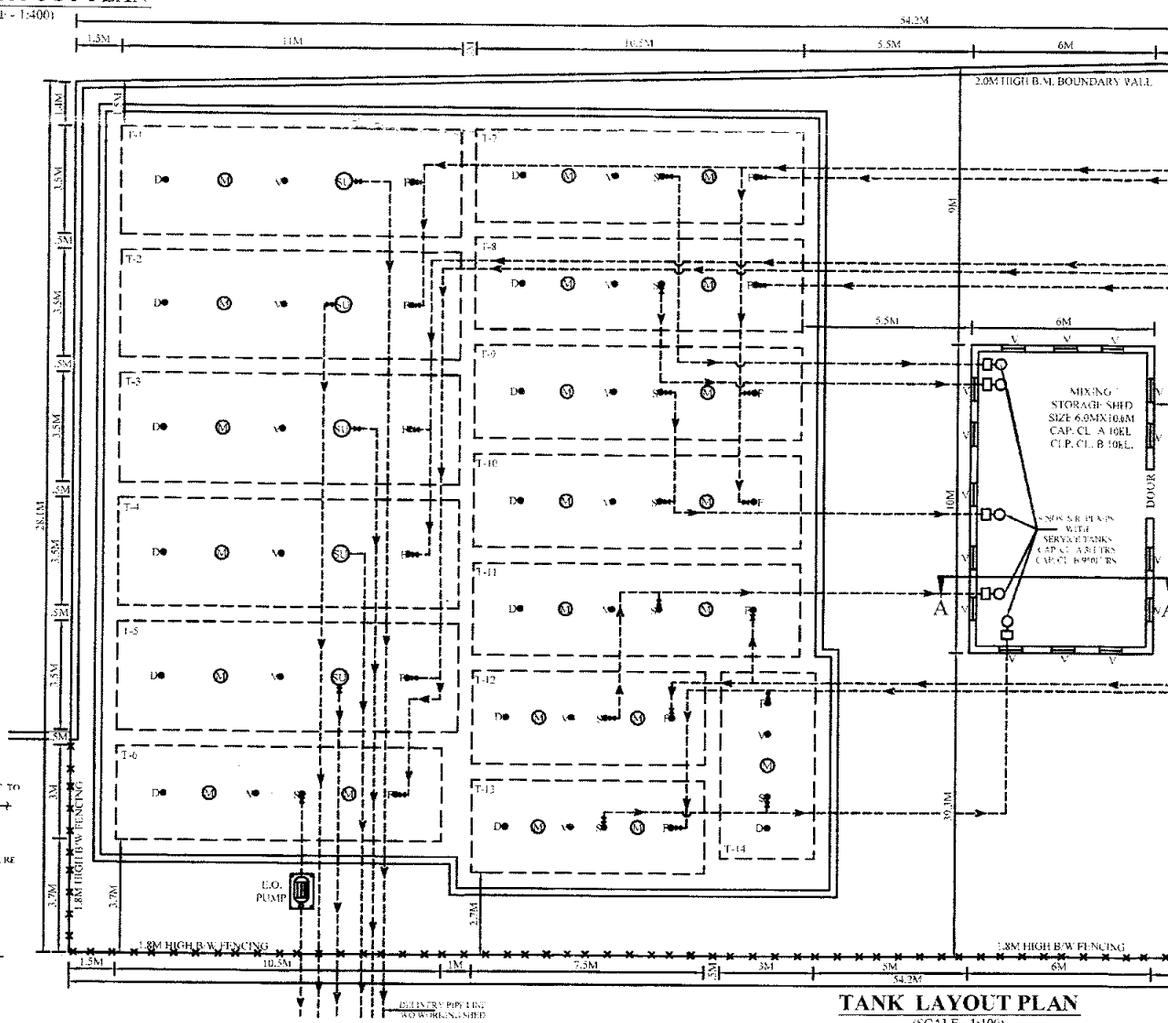


SECTION OF SERVICE TANK
(NTS)



TANK LAYOUT PLAN
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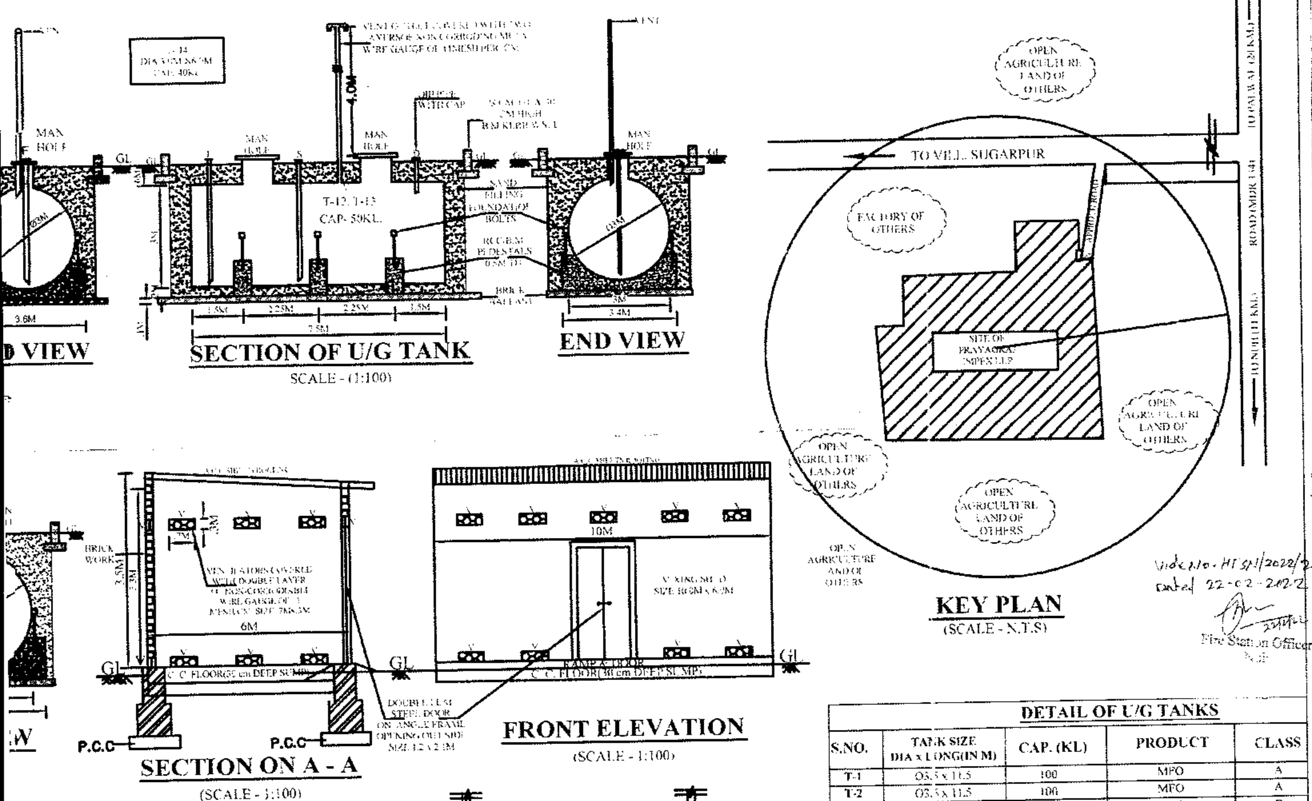
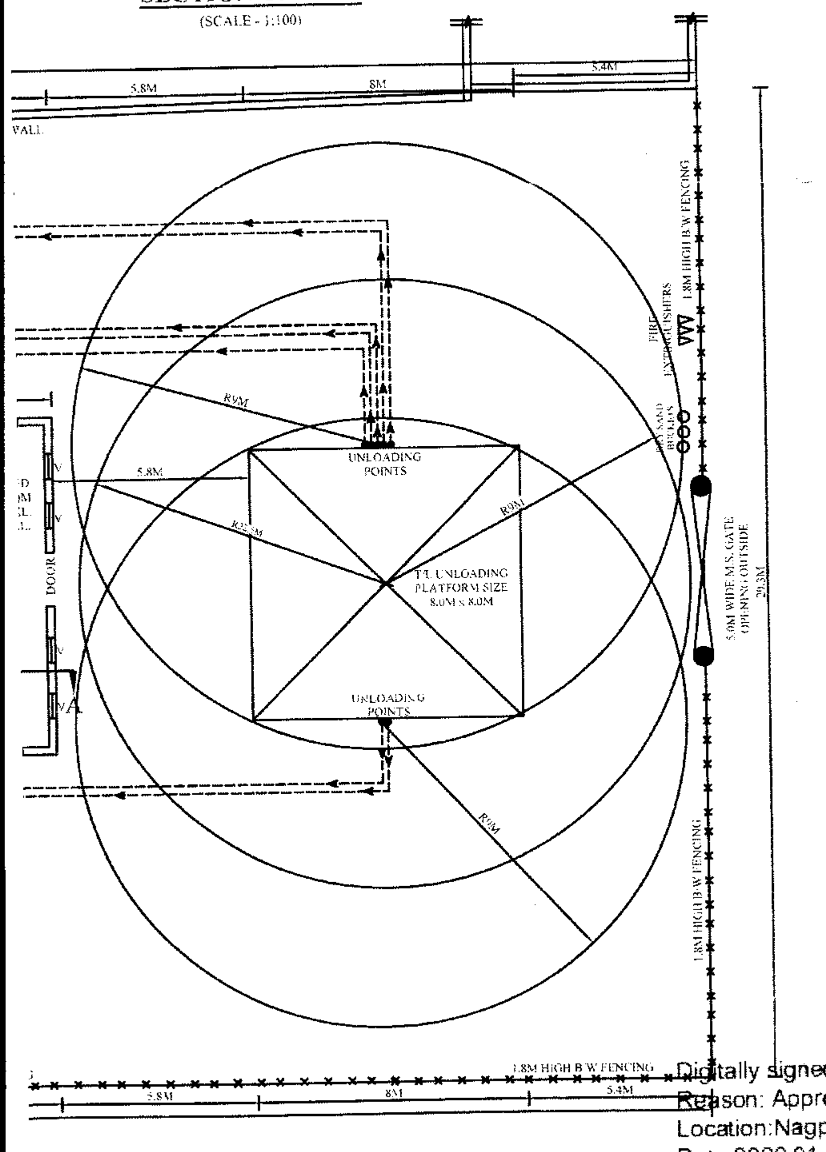


Vide No. HTSN/2022/226 dated 22-02-2022

Fire Station Officer Nuh

C/S District Magistrate Nuh



DETAIL OF U/G TANKS

S.NO.	TANK SIZE DIA x LONG(IN M)	CAP. (KL)	PRODUCT	CLASS
T-1	O3.5 x 11.5	100	MFO	A
T-2	O3.5 x 11.5	100	MFO	A
T-3	O3.5 x 11.5	100	MTO	B
T-4	O3.5 x 11.5	100	MTO	B
T-5	O3.5 x 11.5	100	LDO	C
T-6	O3.1 x 10.5	70	LDO	C
T-7	O3.1 x 10.5	70	ACETONE	A
T-8	O3.0 x 10.5	70	TOLUENE	A
T-9	O3.0 x 10.5	70	MTO	B
T-10	O3.0 x 10.5	70	MTO	B
T-11	O3.1 x 10.5	70	C-9	B
T-12	O3.0 x 7.5	50	C-9	B
T-13	O3.0 x 7.5	50	XYLENE	B
T-14	O3.0 x 6.0	40	XYLENE	B

NOTES:

1. TANK FED BY TANK LORRY.
2. SUCTION PIPE LINES 60CM BELOW GL IN PIPE SLEEVES.
3. E.O PUMPS CONFORM TO IS :ICE:60079-1:2007 FLP TYPE
4. VENT PIPE FITTED ON TOP WITH PV VALVE
5. FILL POINT FITTED WITH LOCK COUPLING AND AIR TIGHT THREADED BRASS CAP FOR DECANTING FROM TANK LORRY.
6. ALL ELECTRICAL WIRES ARE IN CONDUIT PIPE.
7. THERE IS NO ELECT LINES PASSING OVER THE SITE.
8. TANK FABRICATED WITH 8MM THICK MS PLATE WELDED.
9. TANK PAINTED WITH TWO LAYERS OF BITUMEN OVER TWO COATS OF RED LEAD PRIMER TO PROTECT OVER THE CORROSION.
10. FABRICATION DESIGN OF U/G TANKSCONFIRMING TO IS: 10987 REFIRMED IN 1998 AS PER CCE NAGPUR ORDER NOP - 40(SC) P MISC - 99 - 24/02/99.
11. THERE IS NO OPEN DRAIN SEWER LINE ANY STRUCTURE WITHIN THE 6M OF STORAGE TANK.
12. DIP PIPE SUPPLIED THE TANK FOR THIS TYPE OF INSTALLATION SHOULD BE APPROVED TYPE.
13. NATURAL DOWN SLOPE FROM THE EDGE OF METTALLED ROAD TO CULVERT ON APPROACHES WILL BE MAINTAINED FOR FREE FROM FLOW OF WATER TOWARDS DRAIN OF 11MESH/CENTIMETER.
14. D.P.S. SWITCH IS TO BE FIXED 1.5 M FROM GROUND LEVEL.
15. NO SMOKING SIGN BOARDS PROVIDED.
16. SUPPLY /FILL PIPE 15 CM ABOVE FROM BOTTOM OF U/G TANK.
17. CENTER OF TANK LORRY & FILL POINTS ARE 9.0 M CLEAR FROM ALL SIDES
18. CONSTRUCTION OF ALL FACILITIES AS PER RELEVANT IS SPECIFICATION.
19. FIRE EXTINGUISHERS & DRY SAND BUCKETS SHOULD BE PROVIDED.
20. SITE IS FREE FROM ANY LITIGATION & NO CASE IS PENDING IN THE COURT OF LAW.
21. PROPOSED SITE SHOWN IN RED COLOUR.

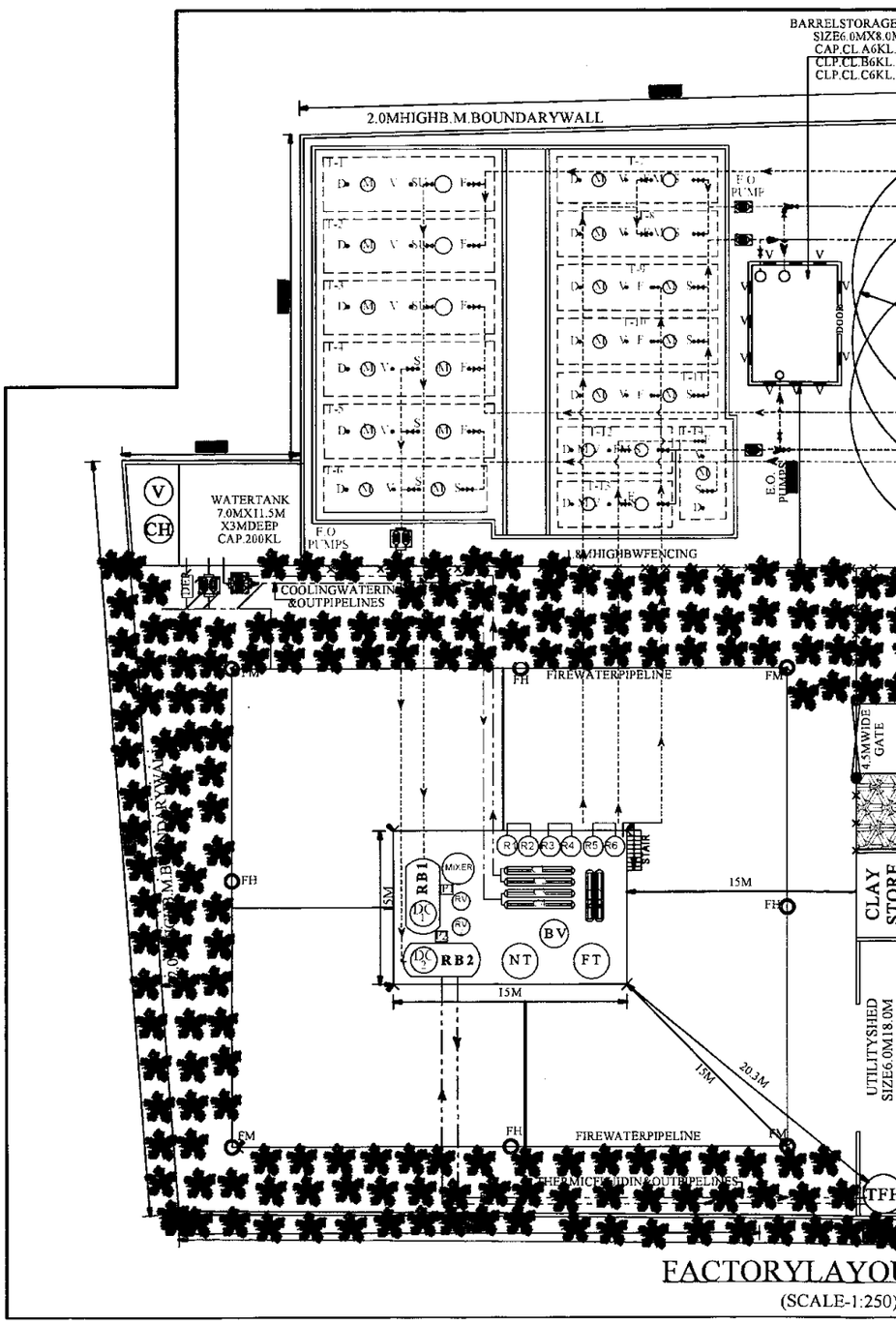
PLAN OF FOURTEEN NOS. UNDER GROUND TANKS FOR STORAGE OF PETROLEUM CLASS - A,B,C & MIXING / STORAGE SHED IN OUR UNIT

PRAYAGRAJ IMPEX LLP
KH. NO. 18/23, 45/52,
KILA NO. 12/2 , 12/1 M, 20/1,19/1,19/2,19/3,
VILL. SUGARPUR, TEHSIL - NUH
DISTT. NUH (MEWAT)
(HARYANA)

VILL - SUGARPUR	TEHSIL - NUH	
P.S. - NUH	DISTT - NUH (MEWAT)	
RLY. STN - PALWAL	STATE - HARYANA	APPLICANT
	DRG.NO.PIL/2021 DT.04/01/2022	

Digitally signed by SHIVCHANDRA D MISHRA
Reason: Approval No: A/P/HQ/HN/15/2444
Location:Nagpur [I-527423]
Date:2022.01.17 06:27 +05:30

THREE TIER PLANTA



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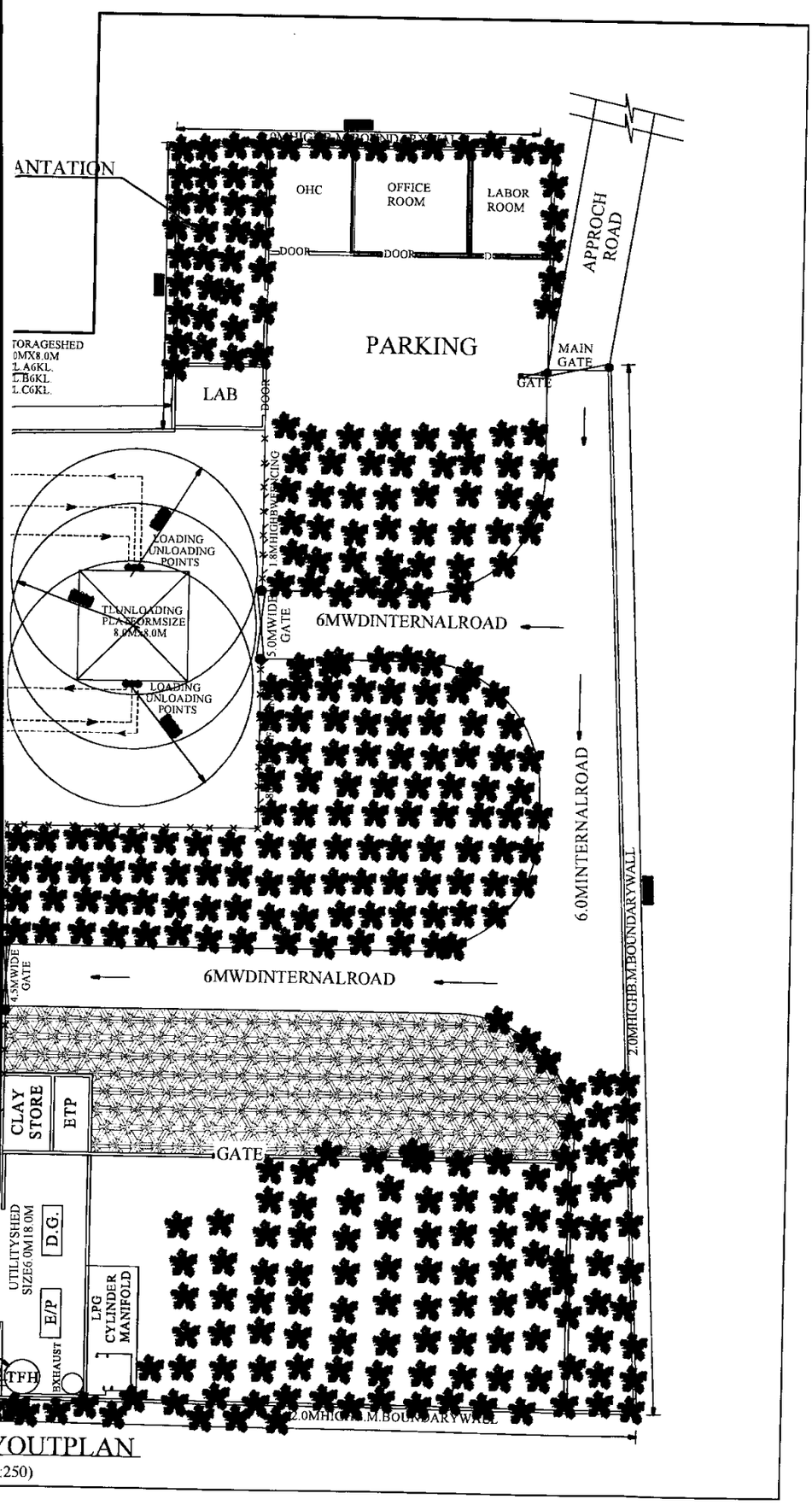

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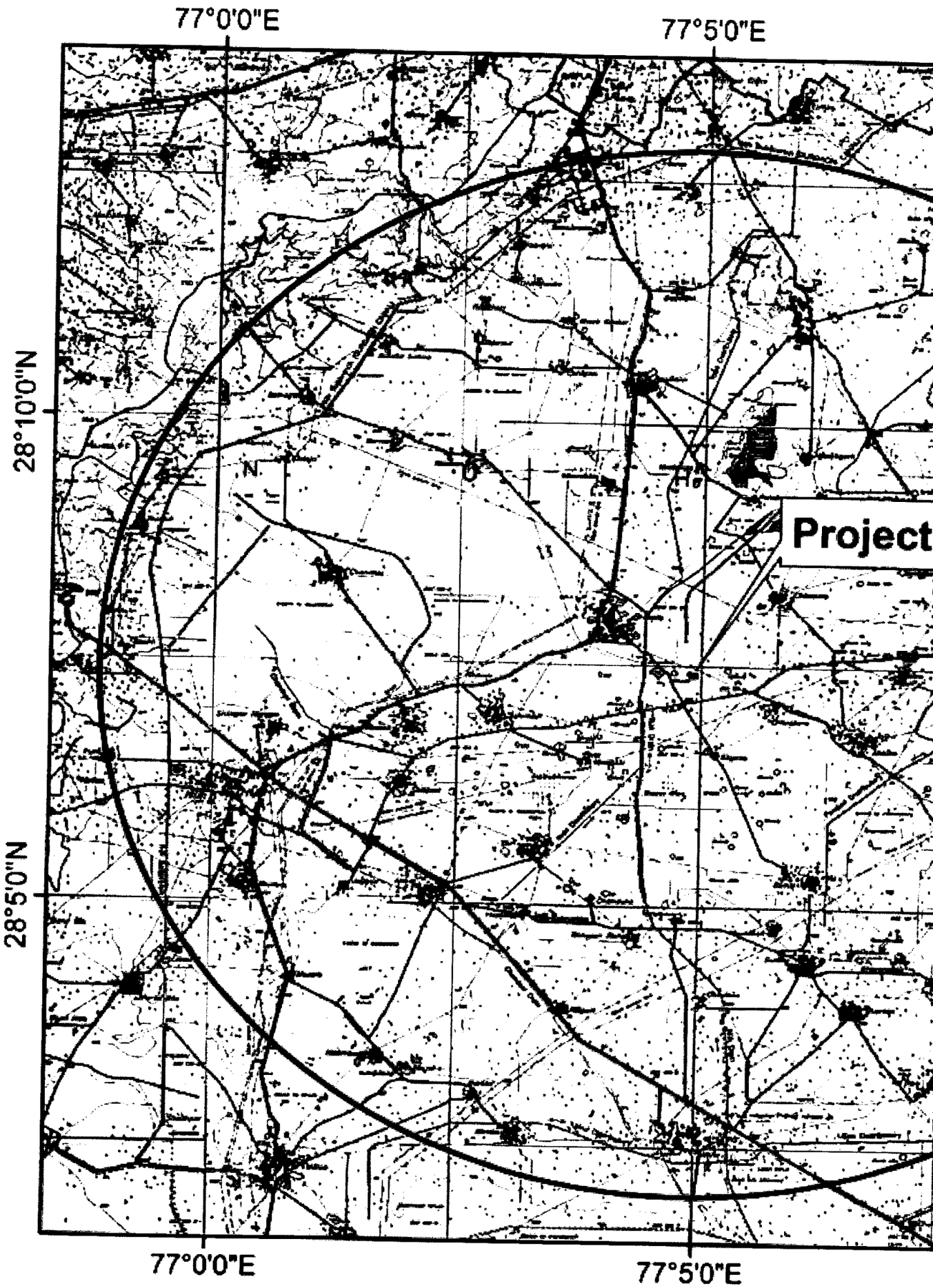
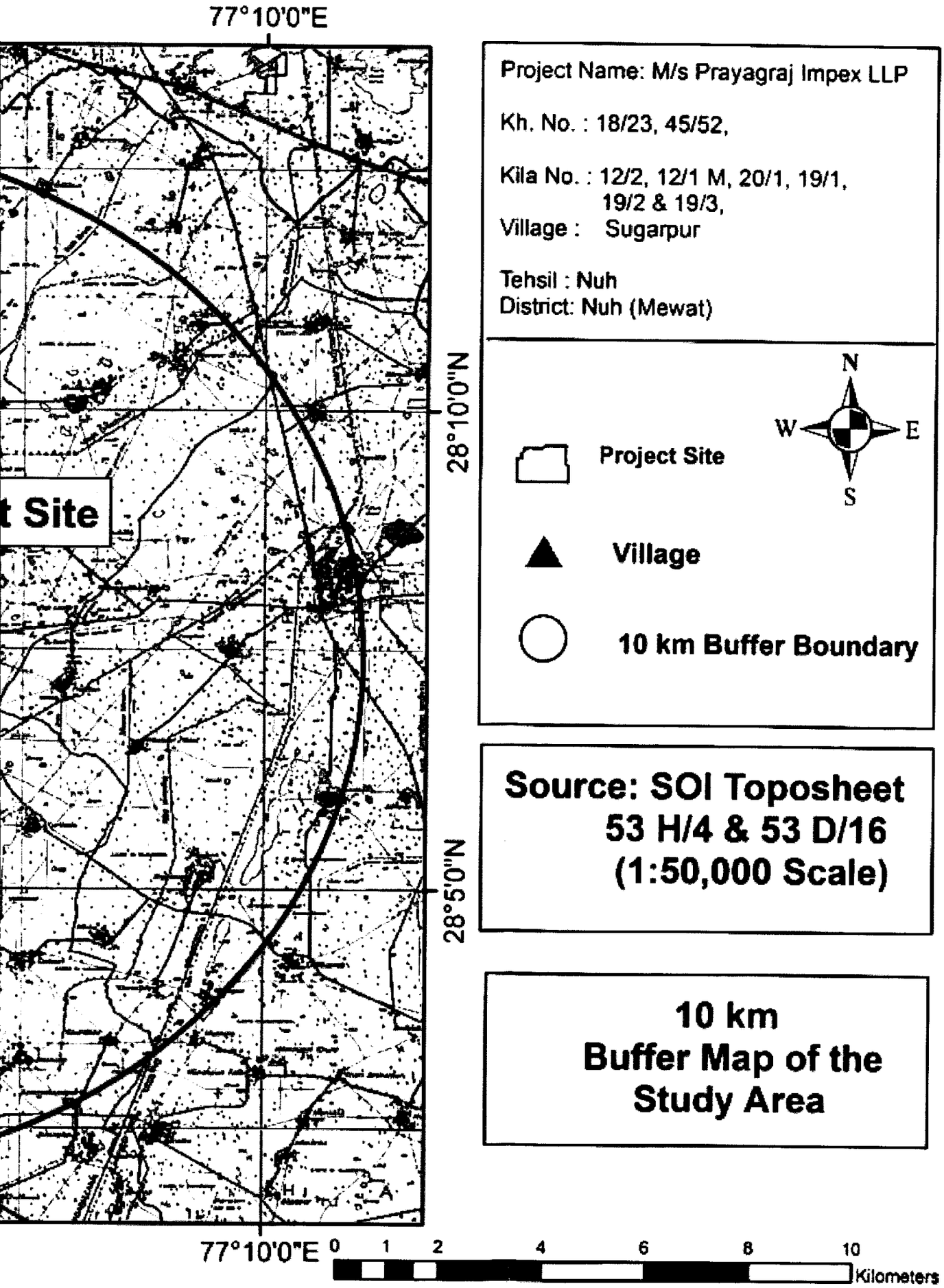



77°10'0"E
28°10'0"N
28°5'0"N
77°10'0"E
t Site
Project Name: M/s Prayagraj Impex LLP
Kh. No. : 18/23, 45/52,
Kila No. : 12/2, 12/1 M, 20/1, 19/1, 19/2 & 19/3,
Village : Sugarpur
Tehsil : Nuh
District: Nuh (Mewat)
N
W
E
S
Project Site
Village
10 km Buffer Boundary
Source: SOI Toposheet 53 H/4 & 53 D/16 (1:50,000 Scale)
10 km Buffer Map of the Study Area
0 1 2 4 6 8 10
Kilometers

2287076/2022/Estt.Br

Directorate of Town & Country Planning, Haryana
Plot No. 3, Sector 18-A, Madhya Marg, Chandigarh, Website: tcpharyana.gov.in
Phone: 0172-2771300; E-mail: tcpharyana7@gmail.com

To

Mr/Ms. M/s Prayagraj Impex LLP
Village Sugarpur,
Nuh,
Haryana,
Memo No. E-Diary-156378/2022/TCP-OFA/349/2022 Dated: 28/02/2022

Subject: Application for Information/Verification for unit falling beyond Controlled Area but falling in Urban Area OR falling outside both controlled Area & Urban Area received vide diary no. TCP-OFA/4042/2022 dated 28/02/2022.

This has reference to your application for NOC outsideUrban Areas / Controlled Areas vide diary no. TCP-OFA/4042/2022, dated 28/02/2022, AppliationNo: NOC-7996A. Land details of the site are given below:

Sr. No.	Revenue Estate	Rectangle No.(Mustil)	Kila/Khasra No.
1	Sugarpur(201)	14	12/1
2	Sugarpur(201)	14	12/2
3	Sugarpur(201)	14	19/1
4	Sugarpur(201)	14	19/2
5	Sugarpur(201)	14	19/3
6	Sugarpur(201)	14	20/1

It is informed that the site as per the land details mentioned above, falls outside the Urban Areas / Controlled Areas.

This is further subject to following conditions:-

1. Department does not confirm the ownership title on the above land. It is the sole responsibility of the applicant who is entering the information.
2. This memo only verifies the location of above stated land viz-a-viz Urban Areas / Controlled Areas.
3. This information does not provide any immunity to applicability of any other Acts/Rules and regulations of the State Govt. as well as Govt. of India or any other instructions, if applicable to the site/area in question.
4. As and when the site in question is covered under controlled area. you will have to seek fresh permission under the provisions of the Punjab Scheduled Roads and Controlled areas Restrictions of Unregulated Development Act , 1963.
5. The applicant shall adopt the planning norms confirming to BIS and NBC standards during the actual execution of building at site and he shall be solely responsible for structural safety as well as provisions made for fire safety inside the building.
6. The applicant shall not raise any construction within 30 meters restricted belt.

Any breach of the above conditions shall construe automatic cancellation of this memo.

Directorate of Town and Country Planning
Haryana

NOTE: This is a system generated document and hence does not need signatures.

2287076/2022/Estt.Br

OFFICE OF DISTRICT TOWN PLANNER, NUH

Room no. 215 & 216, 1st Floor, Mini Secretariat, Nuh
Tel. 01267-274748, E-mail: dtp1.nuh.tcp@gmail.com

To,

Deputy Commissioner,

Nuh

Memo No:- 474 Date: 22/02/22

Sub:- **Noc to store Pet. Class A, B & C in underground tanks in our Unit plot situated at village Sugarpur, Tehsil and Distt Nuh, Haryana.**

Ref:- Your office memo no. 6148-54 dated 11.02.2022.

PLA

On the subject matter and letter under reference, it is submitted that the applied land for NOC falls outside Controlled Area and Urban Area of District Nuh. Hence the applicant may be advised to apply online for NOC through departmental website i.e. https://tcpharyana.gov.in. The report is forwarded for information and further necessary action please.

District Town Planner,
Nuh

OFFICE OF THE DISTRICT MAGISTRATE, NUH
NO OBJECTION CERTIFICATE

No.:-184...../PLA
Dated:-27-04-2022.

Subject: **No Objection Certificate**

With reference to the application no Nil Dated 17-01-2022 submitted by M/s Prayagraj Implex LLP, Village Sugarpur Tehsil and Distt Nuh and in pursuance of rule 144 of the Petroleum Rules, 2002, there is no objection for storage of raw materials Petroleum products Class A, B & C in U/G Tanks Installation at M/s Prayagraj Implex LLP, Village Sugarpur, Tehsil and Distt Nuh (Haryana) is shown in the site plan.

M/s Prayagraj Implex LLP at Village Sugarpur, Tehsil and Distt Nuh subject to fulfillment of conditions laid down in the NOC,s issued by:-Superintendent of Police, Nuh letter no. 4196 dated 09-03-2022, Sub. Divisional Officer (c), Nuh letter no. 153/RK dated 22-03-2022, Div. Forest Officer, Nuh letter no. 1789 dated 28-02-2022, Distt. Town Planner, Nuh letter No. 474 dated 22-02-2022 (Dir. Town & Countary Planning, Haryana, Chandigarh letter No.156378/2022/TCP-OFA/349/2022 datad 28-02-2022) DFSC, Nuh Letter No. 498 dated 24-02-2022, Xen DHBVN, Nuh Letter No. 1273 dated 17-03-2022, RO, HSPCB, Nuh letter no. 1805 dated 30-03-2022 & Fire Station Officer, Nuh letter No. HFSN/2022/226 dated 22-02-2022.

The No Objection Certificate is revocable if any of the conditions and instructions of the Government are violated.

DISTT. MAGISTRATE NEW NUH

District Magistrate,
Nuh.

Endst. No :- 185-95 /PLA Dated :- 27-04-2022.

A copy is forwarded to the following for information & necessary action:-

1. Chief Controller of Explosive Department of Explosive, A-Block 5th Floor CGO Complex, Seminary Hills, Opp.TV Tower Nagpur.
2. Deputy Chief Controller of Explosive, Faridabad.
3. Superintendent of Police, Nuh.
4. Sub. Divisional Officer (c), Nuh.
5. Div. Forest Officer, Nuh.
6. Distt. Town Planner, Nuh.
7. DFSC, Nuh.
8. Xen DHBVN, Nuh.
9. RO, HSPCB, Nuh.
10. Fire Station Officer,, Nuh.
11. M/s Prayagraj Implex LLP, Village Sugarpur, Tehsil & Distt Nuh.

District Magistrate,
Nuh.

SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT

FOR PUBLIC HEARING

GREENFIELD PROJECT

FRACTIONAL DISTILLATION OF PETROLEUM CRUDE & MIXTURE OF HYDROCARBONS (12000 KL/ANNUM)

At

Khata No. 18/23,45/52

KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3,

Village – Sugarpur, Tehsil-Nuh,

District-Nuh (Mewat), Haryana – 122107

Plot Area: 6500 sq. m.

Production Capacity: 12000 KL/Annum

Project Cost: 2 Cores

[ToR Letter No: No. IA-J-11011/180/2022-IA-II(I) Dated: 01 June 2022]

[Study Period: 1St March, 2022 to 31st May, 2022]

[Schedule 5(e), Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)

Category –"A" as per EIA Notification 2006 and its amendment time to time]

SUBMITTED BY

PRYAGRAJ IMPEX LLP

Reg. Address: C/21, Shivaji Park Punjabi Bagh, New Delhi,

North East, Delhi,110026, India

E-mail: prayagrajimpex108@gmail.com

August-2022

CONTENTS

1.0 PROJECT DESCRIPTION

Proposed project of Fractional distillation of Petroleum Crude and mixture of hydrocarbons with capacity of 12000 KL/year at village- KH. No. 18/23,45/52 KILA No.12/2, 12/1 M,20/1, 19/1,19/2,19/3 Village – Sugarpur, Tehsil-Nuh, District-Nuh (Mewat) Haryana – 122107. The proposed project lies in Latitude: 28.123767º and Longitude: 77.082495º. Capital cost of project is Rs. 2 Crores.

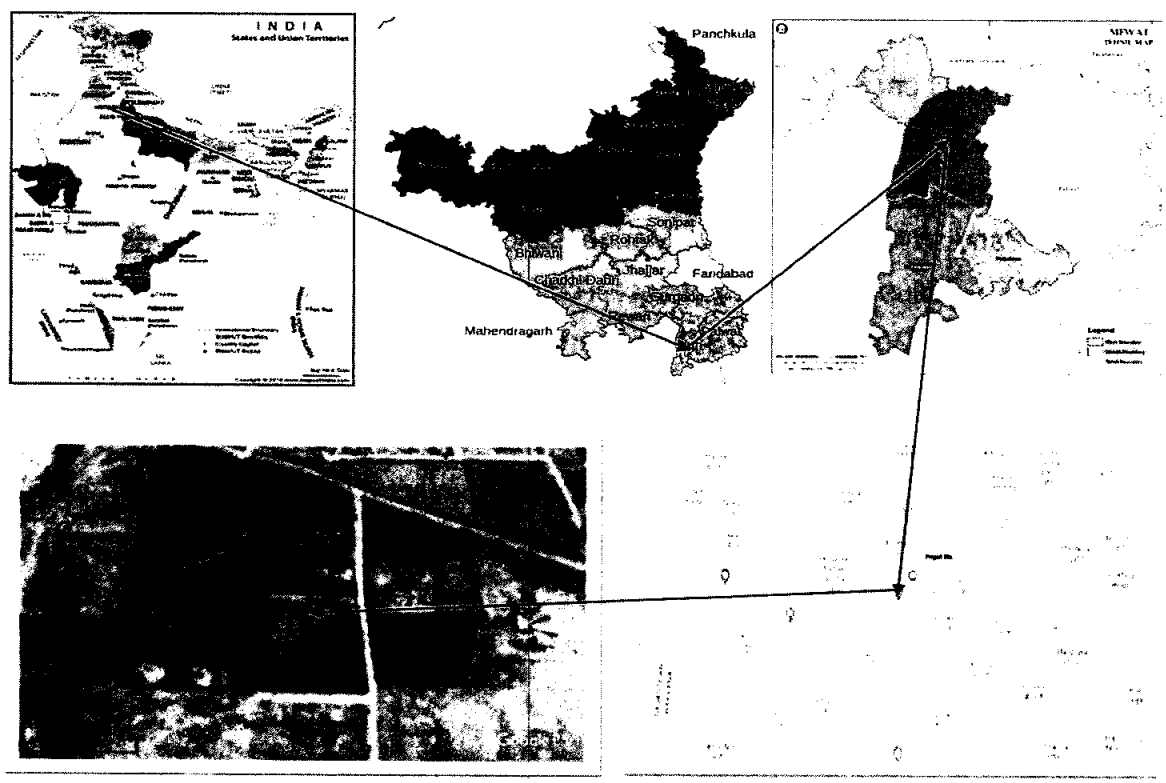


Fig 1. Location of Project

The project falls under Category 'A' of Schedule 5 (e), as per the EIA Notification, 2006 & its amendment till date and will be appraised by EAC (Industry-II), MoEF&CC, New Delhi.

Application for obtaining Terms of References (TOR) had been submitted to MoEF&CC for conducting the EIA studies in prescribed application along with Pre-Feasibility

Report to the MOEF&CC, New Delhi vide proposal No. IA/HR/IND2/274435/2022 and ToR was granted vide IA-J-11011/180/2022-IA-II(I) dtd. 01 June 2022.

The summary (English and Hindi) with DEIA report is submitted for conducting Public Hearing. The comments and suggestions received during the public consultation process will be incorporated in the final EIA Report. Final EIA Report will be submitted to MOEF&CC for appraisal after public hearing.

Total land of 6500 sq. m. is required for the proposed project. Company proposes to develop Greenbelt area on 33% of the total land *i.e.* 2145 m^2. Density of trees will be 2500 trees/ha as per the MoEFC&CC norms. Approx. 537 nos. of trees and 200 nos. of shrubs will be planted within the within one year.

National Park/ Wildlife sanctuary/ Marine sanctuary/ Reserve Forest is not located within 10 kms radius of proposed project. Total water consumption will be 2 KLD. Power requirement 180 KVA electricity will be sourced from HSEB and for emergency DG Set will be available. LDO, HSD will be used as fuel and sourced from local supplier. 15 Nos. of manpower including contractor workers will be employed during operation phase. Effluent will be generated from proposed project is treated. Treated water is totally reused back in to the process, hence proposed project is Zero Liquid Discharge (ZLD) unit. Adequate size and No. of APC (Cyclone Separator, Bag filter, Alkali Scrubber) will be provided to achieve the statutory norms.

Requirement of Project:

Components	Quantity	Source of Supply
Land	6500 m^2	Leased
Water	2 KL	Ground Water
Raw Material	Petroleum Crude	Local market
Power	180 KVA	HSEB
Fuel - LDO & HSD	LDO-3.25 KLD HSD- 20 l/hr	Local Market

Gaseous Emission: Flue gas Emission from proposed utility operations such as Steam Boiler and D.G. set. LDO and HSD will be used as a fuel. The significant pollutants identified due to flue gas emissions are/will be PM, NOx and SO_2 and CO.

Liquid Effluent: Wastewater will be treated and treated water will be reused back to process, however, there is no waste water expected from the proposed unit. Hence proposed project is Zero Liquid Discharge (ZLD) unit.

Solid and Hazardous Waste After proposed expansion

- Used Oil: 0.2 TPA
- Fly Ash: 50 TPA
- Poly Bag: 1 TPA

Salient Features of Study Area

S.No.	Particulars	Description	Distance & Direction
1.	**Latitude and Longitude of the site**	Latitude- 28.123767º Longitude- 77.082495º	-
2.	**Nearest Village**	Sugarpur (Revenue Village but not human settlement) Ghasera	Ghasera- approx. 0.65 km
3.	**Nearest City**	Nuh	Approximately 5 km
4.	**Nearest District**	Mewat	Approximately 14 km
5.	**Nearest Highway**	248A	At a distance of 1.76 km W
6.	**Nearest Railway station**	Palwal Railway Station	Is at around 25.67 km ESE
7.	**Nearest Airport**	Delhi International Airport	At approximately 46 km N
8.	**State, National boundaries**	Inter State Boundary Rajasthan and Haryana	At a distance of 12.61 km
9.	**Nearest Water body**	None	In 5 km Radius
10.	**Archaeological site**	None	In 10 km Radius
11.	**National Park/ Wildlife sanctuary/ Marine sanctuary/ Reserve Forest**	None	In 10 km Radius
12.	**Nearest Industry**	Plyboard industry	On main road at a distance of 350 m
		Tyre Pyrolysis industry	At a distance of 400 m

2.0 DESCRIPTION OF BASELINE ENVIRONMENT

Baseline environmental study has been carried for the period 1st March, 2022 to 31st May, 2022 (Pre-Monsoon Season). Baseline data has been collected out by Enviro-Tech Services Laboratory (NABL accredited (T-8771 valid till 25/12/2023) and Recognized by MoEF&CC, New Delhi).

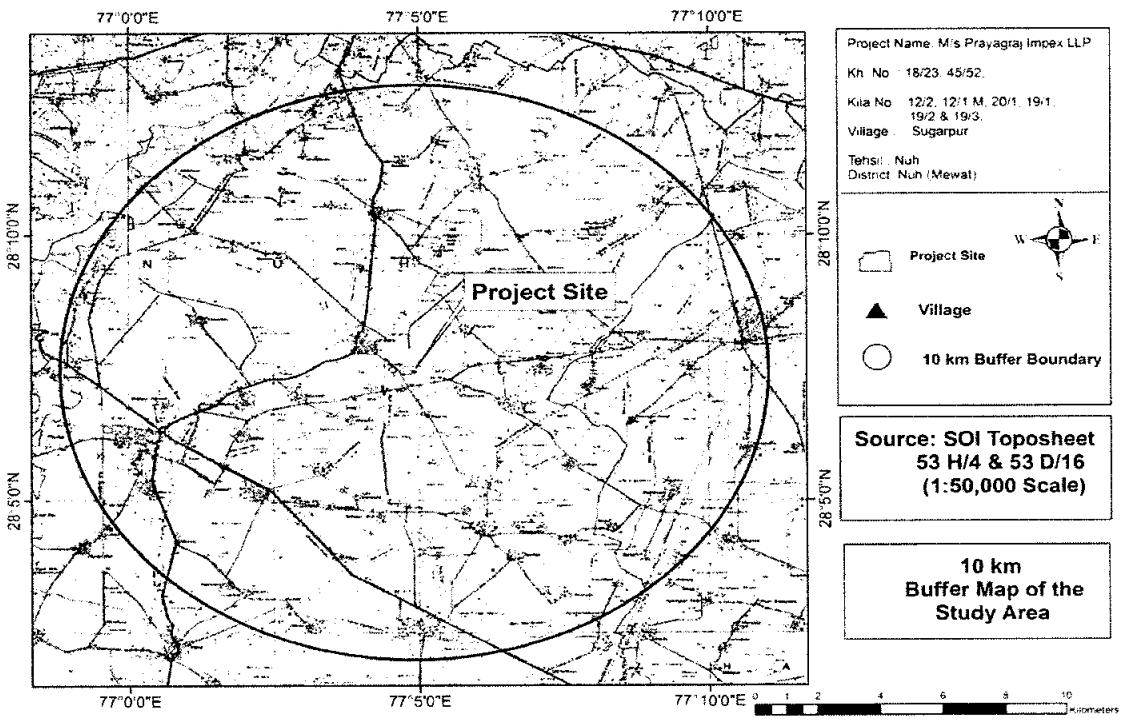


Fig 2. Study area Map

Summary of Baseline Data:

S. No.	Parameters	Baseline Status
1.	**Ambient Air Quality**	
i.	PM_{10} (µg/m^3)	79.42-94.13
ii.	$PM_{2.5}$ (µg/m^3)	39.66-53.96
iii.	SO_2 (µg/m^3)	11.89-14.52
iv.	NO_2 (µg/m^3)	21.04-24.73
v.	CO (µg/m^3)	0.57-0.81

S. No.	Parameters	Baseline Status
All results have been found within the NAAQ Standard Limit		
2.	**Noise Level Monitoring**	
i.	Day Time (06:00 AM to 10:00 PM) dB Leq	46.1-57.4
ii.	Night Time (10:00 PM to06:00 AM) dB Leq	35.4-48.1
The observed noise levels are meeting the acceptable norms		
3.	**Soil Quality and Characteristics**	
i.	pH	7.11-7.51
ii.	Organic Matter (%)	0.61-1.56
iii.	Total Nitrogen (%)	0.063-0.09
iv.	Total Phosphorous (mg/kg)	51.65-77.86
v.	Available Calcium (mg/kg)	3205.41-4549.55
vi.	Available Magnesium (mg/kg)	389.18-577.45
4.	**Ground Water**	
i.	pH	7.98-8.31
ii.	TDS (mg/L)	1411-1786
iii.	Total Hardness (mg/L)	403-760
iv.	Total Alkalinity (mg/L)	213-512
5.	**Surface Water**	
i.	pH	7.36-8.16
ii.	TDS (mg/L)	251-435
iii.	DO (mg/L)	7.4
iv.	BOD (mg/L)	8- 10.30

3.0 ANTICIPATED ENVIRONMENTAL IMPACT & MITIGATION MEASURES

There will be no industrial wastewater discharge as the plant will be designed on zero effluent discharge principle. Low noise emitting plant and machinery will be selected. Only valid PUC certified vehicle will be used for the transportation of materials and

equipment. 33% land area will be developed as greenbelt. The noise level at plant boundary will be maintained below 70 dBA.

Impacts on land environment, air environment, water environment, noise environment, biological environment, socioeconomic environment and risk and hazard is been introduced in the chapterwith their mitigation measures for both during construction as well as operation phase. Matrix study and its representation has also been carried out and briefed in chapter. Total cumulative score for various Environmental Parameters without mitigation measures is -165 during construction phase which is adverse impact. Total cumulative score for various Environmental Parameters with mitigation measure is +16 with appreciable beneficial impact during operation phase. Air modeling study has bee done showing maximum and minimum GLC in the surrounding area. Proper upkeep and maintenance of vehicles and APCM will reduce the impact on air environment. Unit will develop more than 33% of greenbelt within the premises. Positive impact is envisaged on Socio economic environment. Proper PPEs will be provided to all the workers. From the impact matrix table, it is observed that without mitigation measures the scoring of operation phase is -254 After taking adequate mitigation measures impact reduces to -27, which is a not an appreciable adverse impact. it can be concluded that the overall negative impacts from various activities on different environmental parameters is negligible with proper EMP in place

4.0 ENVIRONMENTAL MONITORING PROGRAM

The environment monitoring for the proposed greenfield Fractional Distillation plant operation will be conducted asfollows:

- Ambient Air quality;
- Water and wastewater quality;
- Ambient Noise levels;
- Soil Quality;
- Greenbelt Development;
- CSR;
- Occupational Health Surveillance.

Monitoring of important and crucial environment parameters is of immense importance to assess the status of environment during operation of fractional Distillation of petroleum crude by M/s Prayagraj Impex LLP will formulate the Environmental Management Cell. The EMC shall be responsible for all activities.

5.0 ADDITIONAL STUDIES

Additional studies include Identification of hazards in the proposed project activity is of primary significance. Qualitative and Quantitative both risk has been analyzed. Risk Assessment and hazard identification and control measures of the same have been carried out. Prayagraj Impex LLP has developed an emergency preparedness plan and Disaster Management Plan. Fire alarm panel (electrical) will cover the entire plant. The Environmental Management Cell (EMC) will handle of all the related activities such as collection of statistics of health of workers and population of the region, afforestation and green belt development. The fire protection system for the unit will be provide for early detection, alarm, containment and suppression of fires. The occupational health centre with adequate facilities will available at plant site to maintained round the clock. Medical Personnel/Medical Doctor will be available at site for emergency relief. First aid kit will be provided. Appropriate personal protective equipment will be provided to all workmen as and when required. All records of On-Site and Off-Site Emergency Plan shall be well maintained and preserved.

CER will be done as per norm of MoEF&CC Office Memorandum vide F.No.22-65/2017-IA.III dated. 30th September 2020. Total Rs. 4.0 Lakhs, which is 2% of the total cost of the project for allocated by Project Proponent to address the activities for CER.

6.0 PROJECT BENEFITS

The proposed project is expected to yield a positive impact on the socio-economic environment within the study area. It helps to sustain the development of this area including further development of physical infrastructural facilities.

About 15 persons will get employment during the construction stage. The preference will be given to local population for employment in the semi-skilled and unskilled category this will increase the employment opportunity in the surrounding area.

Construction and operation phase of the proposed project will involve a certain number of laborers, contractors and construction workers.

More revenue will be generated by the way of GST to the State & Central exchequers.

7.0 ENVIRONMENTAL MANAGEMENT PLAN

Green belt will be developed to reduce noise impacts. Construction activities will be carried out during day time only. Regular water sprinkling will do to reduce PM concentration in the atmosphere. PPEs will be provided to workers and first aid facilities shall be kept at designated locations during construction phase. Prayagraj Impex LLP proposes to develop 2145 m^2 (33%) greenbelt area of total land 6500 m^2. Approx. 737 Nos. of trees and local shrubs will be planted. Total **Rs. 35 Lakhs** is allocated for Environmental control measures/Environmental management plan. Capital cost of EMP estimates based on cost of wastewater treatment facility, air pollution control equipment, waste management facility, greenbelt development & management plan, safety measures and other components of the EMP shall be implemented along with the commissioning of the proposed project

Workers will be periodically subjected to health check-up. EMC will ensure cleanliness and industrial hygiene in the plant. EMC in association with the safety department will undertake full review of the potential hazard scenarios during plant commissioning. The review will ensure enforcement of the proposed safeguards for pollution abatement, resource conservation, accident prevention and waste minimization. The implementation of EMP would ensure that all elements of project comply with relevant environmental legislation throughout its life cycle.

CONCLUSION

Proposed greenfield project is located in Haryana would not have any considerable impact on environment with efficient mitigation measures implemented. The waste generation in form of gas (flue and process), effluent and solid waste may have impacts on environmental parameters but the proponent has planned and installed most efficient technologies for prevention of emission and treatment of effluent. Further, the solid/hazardous waste will be disposed-off separately. Hence there would not be any considerable impacts on environment. With the implementation of the mitigation

measures and EMP, the proposed project activities will have positive beneficial effect on the local population, economic output and other related facilities *viz.* employment, development of business, transportation *etc.* Rapid risk assessment & 3 D risk assessment including emergency response plan and DMP has been prepared to handle any sort of emergencies. Hence looking to the overall project justification, process, pollution potential and pollution prevention measures /technologies installed by proponent, environmental management activities of proponent; it has been concluded that the proposed project would not have any considerable impacts on environment as well as socio-economic and ecological conditions of the project area. Hence proposed project is considered environmentally safe.

ENVIRONMENT CONSULTANT

Eco Chem Sales & Services
Office Floor, Ashoka Pavilion,
New Civil Road, Surat
E-mail: eco@ecoshripad.com
Contact No.: 0261-2231630

पर्यावरणीय सार्वजनिक सुनवाई

(प्रभाव मूल्यांकन का सारांश)

कच्चे पेट्रोलियम और हाइड्रोकार्बन के मिश्रण (12000 कि. ली. / वर्ष) के भिन्नात्मक आसवन (FRACTIONAL DISTILLATION) की सुविधा

(प्रस्तावित परियोजना के लिए)

खाता संख्या: 18/23,45/52

किला नंबर 12/2, 12/1 एम, 20/1, 19/1,19/2,19/3,

गाँव – शुगरपुर, तहसील-नूंह,

जिला-नूंह (मेवात), हरियाणा – 122107

प्लॉट एरिया: 6500 वर्ग मीटर

उत्पादन क्षमता: 12000 कि. ली. / वर्ष

परियोजना लागत: 2 करोड़

[टीओआर पत्र संख्या: IA-J-11011/180/2022-IA-द्वितीय (I) दिनांक: 01 जून 2022]

[अध्ययन अवधि: 1 मार्च, 2022 से 31 मई , 2022]

[अनुसूची 5 (ई), पेट्रोकेमिकल आधारित प्रसंस्करण (क्रैकिंग और सुधार के अलावा अन्य प्रक्रियाएं और परिसरों के तहत कवर नहीं की गई)

श्रेणी – "ए" ईआईए अधिसूचना 2006 और समय-समय पर इसके संशोधन के अनुसार

द्वारा

मेसर्स प्रयागराज इम्पेक्स एलएलपी

पता: सी /21, शिवाजी पार्क पंजाबी बाग, नई दिल्ली,

उत्तर पूर्व, दिल्ली, 110026, भारत

ई-मेल: prayagrajimpex108@gmail.com

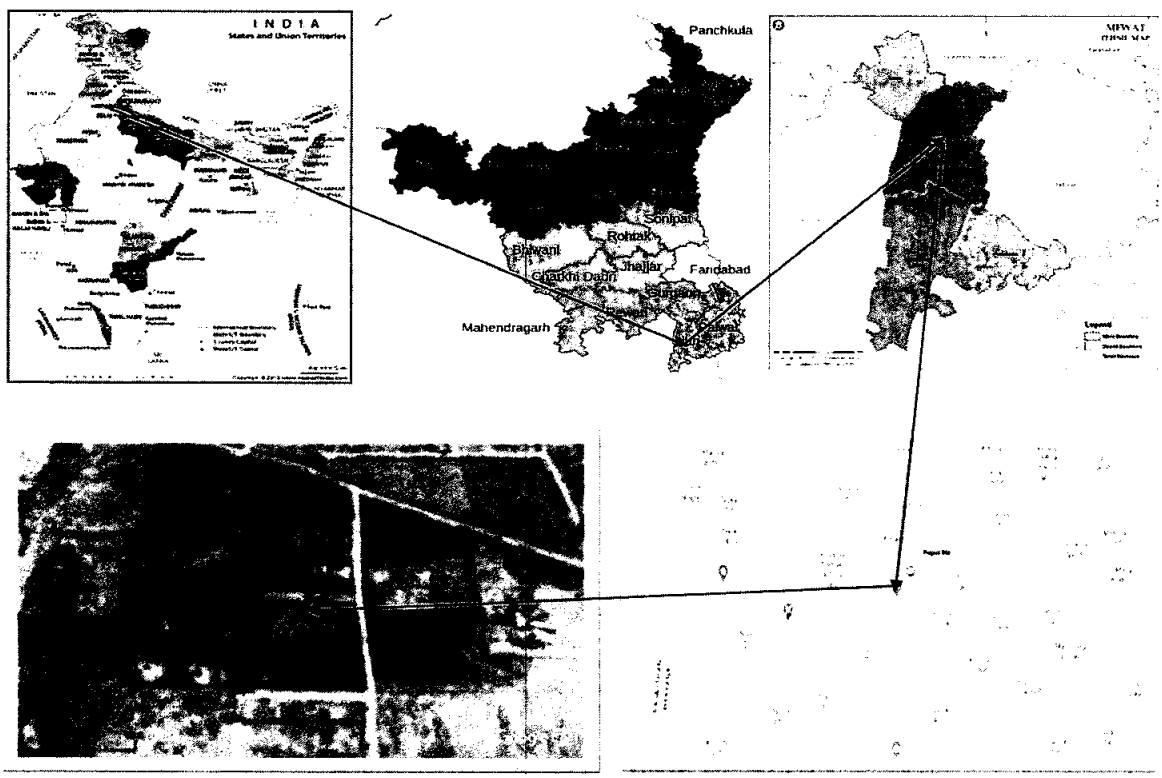
(अगस्त-2022)

सामग्री

1.0 परियोजना विवरण

प्रस्तावित परियोजना कच्चे पेट्रोलियम और हाइड्रोकार्बन के मिश्रण के भिन्नात्मक आसवन की क्षमता 12000 कि. ली./वर्ष खाता संख्या 18/23, 45/52, किला संख्या 12/2, 12/1 एम,20/1, 19/1,19/2,19/3 गांव-शुगरपुर, तहसील-नूंह, जिला-नूंह (मेवात) हरियाणा में स्थित है । प्रस्तावित परियोजना 28.123767º और देशांतर: 77.082495º अक्षांश में स्थित है। परियोजना की पूंजीगत लागत 2 करोड़ रुपये है।

ईआईए अधिसूचना, 2006 और अब तक इसके संशोधन के अनुसार यह परियोजना अनुसूची 5 (ई) की श्रेणी "ए" के अंतर्गत आती है और इसका मूल्यांकन ईएसी (उद्योग-2), पर्यावरण मंत्रालय, नई दिल्ली द्वारा किया जाएगा।



चित्र 1. परियोजना स्थल का मानचित्र

विचारार्थ विषय (संदर्भों की शर्तें-ToR) प्राप्त करने के लिए पर्यावरण मंत्रालय को निर्धारित आवेदन IA/HR/IND2/274435/2022 जमा किया गया था और दिनांक 01 जून 2022 को ToR पत्रांक संख्या IA-J-11011/180/2022-II(I) के माध्यम से प्रदान किया गया।

जन सुनवाई आयोजित करने के लिए प्रारूप ईआईए रिपोर्ट के साथ सारांश (अंग्रेजी तथा हिन्दी) प्रस्तुत किया जाता है। सार्वजनिक परामर्श प्रक्रिया के दौरान प्राप्त टिप्पणियों और सुझावों को अंतिम ईआईए (Final EIA) रिपोर्ट में शामिल किया जाएगा। अंतिम ईआईए रिपोर्ट जनसुनवाई के बाद मूल्यांकन के लिए पर्यावरण मंत्रालय को प्रस्तुत की जाएगी।

प्रस्तावित परियोजना के लिए 6500 वर्ग मीटर की कुल भूमि की आवश्यकता है। कंपनी ने कुल भूमि के 33% यानी 2145 वर्ग मीटर पर हरित पट्टी (ग्रीनबेल्ट) क्षेत्र विकसित करने का प्रस्ताव किया है। पर्यावरण मंत्रालय मानदंडों के अनुसार पेड़ों का घनत्व 2500 पेड़ / हेक्टेयर होगा। लगभग 737 नग पेड़ों की संख्या एक वर्ष के भीतर लगाई जाएगी।

प्रस्तावित परियोजना के 10 किमी के दायरे में कोई भी राष्ट्रीय उद्यान/वन्यजीव अभ्यारण्य/ समुद्री अभयारण्य/आरक्षित वन स्थित नहीं है। पानी की कुल खपत 2 कि. ली. होगी। बिजली की आवश्यकता 180 केवीए और बिजली हरियाणा प्रदेश बिजली विभाग (एचएसईबी) से प्राप्त की जाएगी और आपातकालीन बिजली की आवश्यकता डीजी सेट से उपलब्ध होगी। एलडीओ, एचएसडी का उपयोग ईंधन के रूप में किया जाएगा और स्रोत के रूप में स्थानीय आपूर्तिकर्ता से प्राप्त किया जाएगा। प्रचालन चरण के दौरान ठेकेदार कामगारों सहित कुल 15 नग जनशक्ति की आवश्यकता है। प्रस्तावित परियोजना से बहिस्राव उत्पन्न पानी को उपचारित प्रक्रिया में वापस पुन: उपयोग किया जाता है, इसलिए प्रस्तावित परियोजना शून्य तरल निर्वहन (जेडएलडी) इकाई है। वैधानिक मानदंडों को प्राप्त करने के लिए पर्याप्त आकार और संख्या (चक्रवात विभाजक, बैग फिल्टर, अल्कली स्क्रबर) प्रदान की जाएगी।

परियोजना की आवश्यकता:

घटक	परिमाण	आपूर्ति का स्रोत
भूमि	6500 वर्ग मीटर	पट्टा (लीज्ड)
पानी	2 कि. ली	भूजल
कच्चा माल	पेट्रोलियम क्रूड एवं हाइड्रोकार्बन के मिश्रण	स्थानीय बाजार
शक्ति	180 के वी ऐ (18KVA)	HSEB
ईंधन - LDO और HSD	LDO-3.25 कि. ली. HSD- 20 लीटर/घंटा	स्थानीय बाजार

गैसीय उत्सर्जन: प्रस्तावित परियोजना संचालन के दौरान री-बॉयलर और डीजी सेट से फ्लू गैस उत्सर्जन अपेक्षित है। एलडीओ और एचएसडी का उपयोग ईंधन के रूप में किया जाएगा। फ्लू गैस उत्सर्जन के कारण पहचाने जाने वाले महत्वपूर्ण प्रदूषक PM10, NOX और SOx और CO हैं।

तरल बहिस्त्राव: अपशिष्ट जल बहिस्त्राव को उपचारित किया जाएगा और उपचारित पानी को प्रक्रिया में वापस उपयोग किया जाएगा, हालाँकि इस परियोजना से कोई अपशिस्ट जल का बहिस्त्राव अपेक्षित नहीं है इसलिए प्रस्तावित परियोजना शून्य तरल निर्वहन (जेडएलडी) इकाई है।

प्रस्तावित विस्तार के बाद ठोस और खतरनाक अपशिष्ट

- प्रयुक्त तेल: 0.2 टन प्रति वर्ष
- फ्लाई ऐश: 50 टन प्रति वर्ष
- पॉली बैग: 1 टन प्रति वर्ष

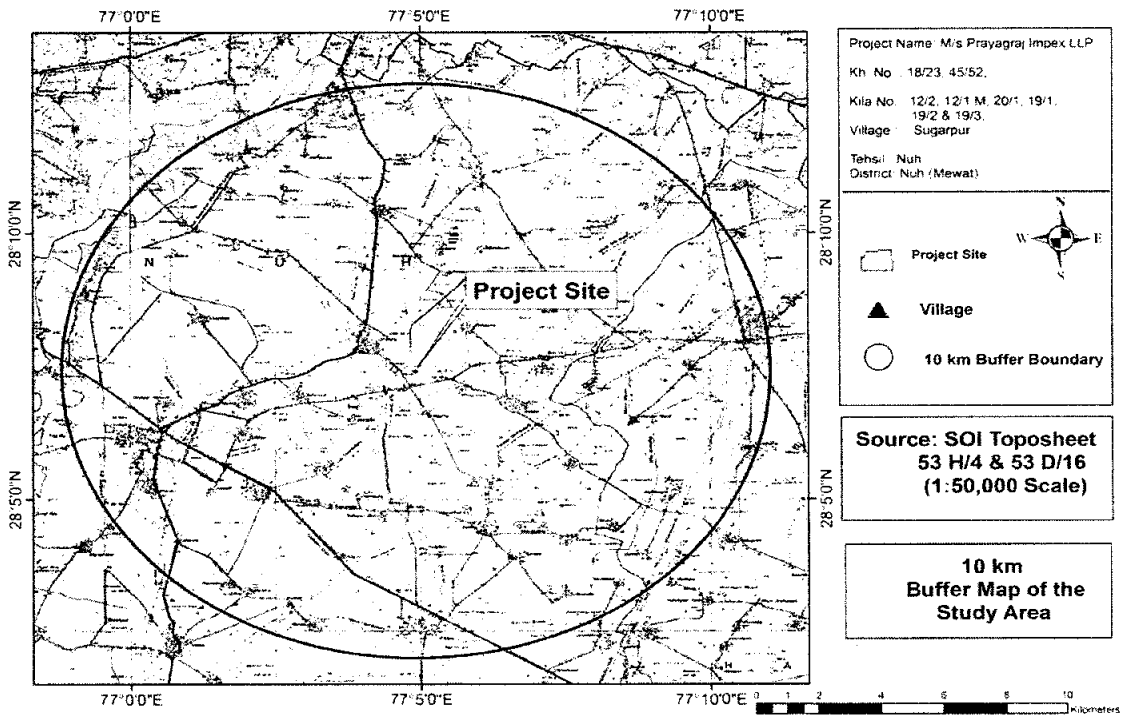
अध्ययन क्षेत्र की मुख्य विशेषताएं

क्रम संख्या	विवरण	वर्णन	दूरी और दिशा
1.	साइट का अक्षांश और देशांतर	अक्षांश- 28.123767º देशांतर- 77.082495º	-
2.	निकटतम गांव	शुगरपुर (राजस्व गांव लेकिन मानव बस्ती नहीं) घासेरा	घासेरा- लगभग 0.65 किमी
3.	निकटतम शहर	नूंह	लगभग 5 किमी
4.	निकटतम जिला	मेवात	लगभग 14 किमी
5.	निकटतम राजमार्ग	248 A	1.76 किमी (पश्चिम) की दूरी पर
6.	निकटतम रेलवे स्टेशन	पलवल रेलवे स्टेशन	लगभग 25.67 किमी पर है
7.	निकटतम हवाई अड्डा	दिल्ली अंतरराष्ट्रीय हवाई अड्डा	लगभग 46 किमी (उत्तर) पर
8.	राज्य, राष्ट्रीय सीमाएं	अंतरराज्यीय सीमा राजस्थान और हरियाणा	12.61 किमी की दूरी पर
9.	निकटतम जल निकाय	कोई नहीं	5 किमी त्रिज्या में
10.	पुरातात्विक स्थल	कोई नहीं	10 किमी त्रिज्या में
11.	राष्ट्रीय उद्यान/वन् यजीव अभ्यारण्य/समुद्री अभ्यारण्य/आरक्षित वन	कोई नहीं	10 किमी त्रिज्या में
12.	निकटतम उद्योग	प्लाईबोर्ड उद्योग	350 मीटर की दूरी पर मुख्य सड़क पर

		टायर पायरोलिसिस उद्योग	400 मीटर की दूरी पर

2.0 बेसलाइन पर्यावरण का विवरण

बेसलाइन पर्यावरण यी अध्ययन 1 मार्च, 2022 से 31 मई, 2022 की अवधि के लिए किया गया है। आधारभूत आंकड़े (बेसलाइन डेटा) NABL मान्यता प्राप्त (T-8771; 25/12/2023 तक मान्य) प्रयोगशाला मेसर्स एनवीरो टेक सर्विसेज (MOEFCC, नई दिल्ली द्वारा मान्यता प्राप्त) द्वारा एकत्र किया गया है।



चित्र 2. स्टडी एरिया का मानचित्र

आधारभूत डाटा का सारांश:

S. No.	पैरामीटर	आधार रेखा स्थिति
1.	**परिवेशी वायु गुणवत्ता**	
i.	पीएम$_{10}$ (µg/m^3)	79.42-94.13
ii.	पीएम$_{2.5}$ (µg/m^3)	39.66-53.96
iii.	SO_2 (µg/m^3)	11.89-14.52
iv.	NO_2 (µg/m^3)	21.04-24.73

S. No.	पैरामीटर	आधार रेखा स्थिति
v.	CO (µg/m^3)	0.57-0.81
सभी परिणाम NAAQS, 2009 मानक सीमा के भीतर पाए गए हैं		
2.	**शोर स्तर की निगरानी**	
i.	दिन का समय (सुबह 06:00 बजे से 10:00 बजे तक) dB Leq	46.1-57.4
ii.	रात का समय (10:00 पीएम से 06:00 पूर्वाह्न) dB Leq	35.4-48.1
मनाया शोर स्तर स्वीकार्य मानदंडों को पूरा कर रहे हैं		
3.	**मिट्टी की गुणवत्ता और विशेषताएं**	
i.	पीएच	7.11-7.51
ii.	कार्बनिक पदार्थ (%)	0.61-1.56
iii.	कुल नाइट्रोजन (%)	0.063-0.09
iv.	कुल फास्फोरस (%)	51.65-77.86
v.	उपलब्ध कैल्शियम (mg/kg)	3205.41-4549.55
vi.	उपलब्ध मैग्नीशियम (mg/kg)	389.18-577.45
4.	**भूजल**	
i.	पीएच	7.98-8.31
ii.	TDS (mg/L)	1411-1786
iii.	कुल कठोरता (mg/L)	403-760
iv.	कुल क्षारीयता (mg/L)	213-512
5.	**सतही जल**	
i.	पीएच	7.36-8.16
ii.	TDS (mg/L)	251-435
iii.	DO (mg/L)	7.4
iv.	BOD (mg/L)	8- 10.30

3.0 अनुमानित पर्यावरणीय प्रभाव और शमन उपाय

कोई औद्योगिक अपशिष्ट जल बहिस्त्राव नहीं होगा क्योंकि संयंत्र को शून्य बहिस्त्राव निर्वहन सिद्धांत पर डिजाइन किया जाएगा। कम शोर उत्सर्जक संयंत्र और मशीनरी का चयन किया जाएगा। सामग्री और उपकरणों के परिवहन के लिए केवल वैध पीयूसी (PUC) प्रमाणित वाहन का उपयोग किया जाएगा। 33% भूमि क्षेत्र को हरित पट्टी (ग्रीनबेल्ट) के रूप में विकसित किया जाएगा। संयंत्र सीमा पर शोर का स्तर 70 dB नीचे बनाए रखा जाएगा।

भूमि पर्यावरण, वायु पर्यावरण, जल पर्यावरण, शोर पर्यावरण, जैविक पर्यावरण, सामाजिक-आर्थिक पर्यावरण और जोखिम और खतरे पर प्रभाव को ध्यान में रखकर ही निर्माण और संचालन दोनों

चरण के लिए उनके शमन उपायों के साथ पेश किया गया है । प्रभाव आंकलन मैट्रिक्स के अध्ययन और इसका निरूपण के आधार पर योजना तैयार की गयी है । निर्माण चरण के दौरान, शमन उपायों के बिना विभिन्न पर्यावरणीय पैरामीटरों के लिए कुल संचयी स्कोर -165 है, जो प्रतिकूल प्रभाव है। शमन उपायों के साथ विभिन्न पर्यावरणीय मापदंडों के लिए कुल संचयी स्कोर निर्माण चरण के दौरान +16 है, जो प्रशंसनीय लाभकारी प्रभाव नहीं है। ऑपरेशन चरण के दौरान शमन उपायों के बिना विभिन्न पर्यावरणीय मापदंडों के लिए कुल संचयी स्कोर -254 है जो प्रतिकूल प्रभाव है। शमन उपाय के साथ विभिन्न पर्यावरणीय मापदंडों के लिए कुल संचयी स्कोर प्रशंसनीय लाभकारी प्रभाव के साथ -27 है । आसपास के क्षेत्रों में अधिकतम और न्यूनतम GLC दिखाने वाले अध्याय में एयर मॉडलिंग (Air Modeling) अध्ययन भी पेश किया गया है। कच्चे माल और उत्पादों के भंडारण के लिए उचित रखरखाव प्रदान किया जाएगा । वायु प्रदूषण नियंत्रण उपकरण के उचित रखरखाव से वायु पर्यावरण पर प्रभाव कम हो जाएगा। इकाई परिसर के भीतर 33% से अधिक ग्रीनबेल्ट विकसित करेगी । सामाजिक आर्थिक पर्यावरण पर सकारात्मक प्रभाव की परिकल्पना की गई है । सभी कामगारों को उचित व्यक्तिगत सुरक्षा उपकरण (PPE) प्रदान किए जाएंगे । प्रभाव मैट्रिक्स तालिका से , यह देखा गया है कि शमन उपायों के बिना निर्माण चरण का स्कोरिंग -254 है पर्याप्त शमन उपाय करने के बाद प्रभाव -27 तक कम हो जाता है, जो एक प्रशंसनीय प्रतिकूल प्रभाव नहीं है । यह निष्कर्ष निकाला जा सकता है कि विभिन्न पर्यावरणीय मापदंडों पर विभिन्न गतिविधियों से समग्र नकारात्मक प्रभाव उचित पर्यावरण प्रबंधन योजना (EMP) के साथ नगण्य है

4.0 पर्यावरण निगरानी कार्यक्रम

प्रस्तावित (ग्रीनफील्ड) फ्रैक्शनल डिस्टिलेशन प्लांट ऑपरेशन के लिए पर्यावरण निगरानी निम्नानुसारआयोजित की जाएगी :

- परिवेशी वायु गुणवत्ता;
- पानी और अपशिष्ट जल की गुणवत्ता;
- परिवेश शोर का स्तर;
- मिट्टी की गुणवत्ता;
- ग्रीनबेल्ट विकास;
- सीईआर /सीएसआर;
- व्यावसायिक स्वास्थ्य निगरानी।

मैसर्स प्रयागराज इम्पेक्स एलएलपी द्वारा पेट्रोलियम क्रूड के आंशिक आसवन के संचालन के दौरान पर्यावरण की स्थिति का आकलन करने के लिए महत्वपूर्ण पर्यावरण मापदंडों की निगरानी का अत्यधिक महत्व है, जो पर्यावरण प्रबंधन प्रकोष्ठ तैयार करेगा । पर्यावरण प्रबंधन प्रकोष्ठ (ईएमसी) सभी गतिविधियों पर निगरानी रखेगा और प्रदूषण नियंत्रण के लिए जिम्मेदार होगा ।

5.0 अतिरिक्त अध्ययन

अतिरिक्त अध्ययनों में प्रस्तावित परियोजना गतिविधि में खतरों की पहचान प्राथमिक महत्व का है । गुणात्मक और मात्रात्मक दोनों जोखिम का विश्लेषण किया गया है। जोखिम मूल्यांकन और खतरे की पहचान और उसी के नियंत्रण उपाय किए गए हैं। मैसर्स प्रयागराज इम्पेक्स एलएलपी ने एक आपातकालीन तैयारी योजना और आपदा प्रबंधन योजना विकसित की है। फायर अलार्म पैनल (इलेक्ट्रिकल) पूरे प्लांट

को कवर करेगा। पर्यावरण प्रबंधन प्रकोष्ठ (ईएमसी) श्रमिकों के स्वास्थ्य और क्षेत्र की आबादी के आंकड़ों के संग्रह, वनीकरण और हरित पट्टी के विकास जैसी सभी संबंधित गतिविधियों को संभालेगा। यूनिट के लिए अग्नि सुरक्षा प्रणाली को आग का जल्दी पता लगाने, अलार्म, रोकथाम और आग के दमन के लिए प्रदान किया जाएगा। व्यावसायिक स्वास्थ्य केंद्र पर्याप्त सुविधाओं के साथ चौबीसों घंटे संयंत्र स्थल पर उपलब्ध होगा। आपातकालीन राहत के लिए चिकित्सा कर्मी/चिकित्सा चिकित्सक स्थल पर उपलब्ध होंगे। प्राथमिक चिकित्सा किट प्रदान की जाएगी। आवश्यकतानुसार सभी कामगारों को उपयुक्त व्यक्तिगत सुरक्षा उपकरण (PPE) प्रदान किए जाएंगे। ऑन-साइट और ऑफ-साइट आपातकालीन योजना के सभी रिकॉर्ड अच्छी तरह से बनाए और संरक्षित किए जाएंगे।

कारपोरेट पर्यावरण उत्तरदायित्व (CER) MoEFCC, नई दिल्ली कार्यालय ज्ञापन के अनुसार F.No. 22-65/2017-IA-III दिनांकित 30 सितंबर 2020 मानदंडों के अनुसार किया जाएगा। कुल 4.0 लाख रुपये बजटीय आवंटन है जो CER के लिए गतिविधियों को संबोधित करने के लिए परियोजना प्रस्तावक द्वारा की गई प्रतिबद्धता के लिए परियोजना की कुल लागत का 2% है।

6.0 परियोजना लाभ

प्रस्तावित परियोजना से अध्ययन क्षेत्र के भीतर सामाजिक-आर्थिक वातावरण पर सकारात्मक प्रभाव पड़ने की उम्मीद है। यह भौतिक अवसंरचनात्मक सुविधाओं के आगे के विकास सहित इस क्षेत्र के विकास को बनाए रखने में मदद करता है। निर्माण के चरण के दौरान लगभग 15 व्यक्तियों को रोजगार मिलेगा। अर्धकुशल और अकुशल श्रेणी में रोजगार के लिए स्थानीय आबादी को प्राथमिकता दी जाएगी इससे आसपास के क्षेत्र में रोजगार के अवसर बढ़ेंगे। प्रस्तावित परियोजना के निर्माण और संचालन चरण में श्रमिकों, ठेकेदारों और निर्माण श्रमिकों की एक निश्चित संख्या शामिल होगी। जीएसटी (GST) के माध्यम से राज्य और केंद्रीय खजाने को अधिक राजस्व उत्पन्न किया जाएगा।

7.0 पर्यावरण प्रबंधन योजना

शोर प्रभावों को कम करने के लिए हरित पट्टी (ग्रीन बेल्ट) विकसित किया जाएगा। निर्माण गतिविधियां केवल दिन के समय में की जाएंगी। वातावरण में पीएम एकाग्रता को कम करने के नियमित रूप से पानी का छिड़काव किया जायेगा। श्रमिकों को पीपीई प्रदान किए जाएंगे और निर्माण चरण के दौरान निर्दिष्ट स्थानों पर प्राथमिक चिकित्सा सुविधाएं रखी जाएंगी। मैसर्स प्रयागराज इम्पेक्स एलएलपी ने कुल भूमि 6500 वर्ग मीटर के 2145 वर्ग मीटर (33%) क्षेत्र को ग्रीनबेल्ट विकसित करने का प्रस्ताव किया है। लगभग 737 नग पेड़ों और स्थानीय झाड़ियों की किस्मों की संख्या लगाई जाएगी। पर्यावरण नियंत्रण उपायों/पर्यावरण प्रबंधन योजना के लिए कुल **35 लाख रुपये** आवंटित किए जाते हैं। प्रस्तावित परियोजना के चालू होने के साथ-साथ अपशिष्ट जल शोधन सुविधा, वायु प्रदूषण नियंत्रण उपकरण, अपशिष्ट प्रबंधन सुविधा, ग्रीनबेल्ट विकास और प्रबंधन योजना, सुरक्षा उपायों और ईएमपी के अन्य घटकों की लागत के आधार पर EMP अनुमानों की पूंजीगत लागत को लागू किया जाएगा।

श्रमिकों का समय-समय पर स्वास्थ्य परीक्षण किया जाएगा। पर्यावरण प्रबंधन प्रकोष्ठ (EMC) संयंत्र में स्वच्छता और औद्योगिक स्वच्छता सुनिश्चित करेगा। पर्यावरण प्रबंधन प्रकोष्ठ सुरक्षा विभाग के सहयोग से संयंत्र कमीशनिंग के दौरान संभावित खतरे के परिदृश्यों की पूरी समीक्षा करेगा। समीक्षा में प्रदूषण उपशमन, संसाधन संरक्षण, दुर्घटना निवारण और अपशिष्ट न्यूनीकरण के लिए प्रस्तावित सुरक्षोपायों का प्रवर्तन सुनिश्चित किया जाएगा। पर्यावरण प्रबंधन योजना यह सुनिश्चित करेगी कि परियोजना के सभी तत्व अपने जीवन चक्र के दौरान प्रासंगिक पर्यावरणीय कानून का पालन करें।

निष्कर्ष

प्रस्तावित परियोजना हरियाणा के नूह जिले में स्थित है, जिसका कार्यान्वयन कुशल शमन उपायों के साथ किए गए जिससे पर्यावरण पर कोई प्रतिकूल प्रभाव नहीं पड़ेगा। गैस (फ्लू और प्रक्रिया), बहिस्त्राव और ठोस अपशिष्ट के रूप में अपशिष्ट उत्पादन का पर्यावरणीय मापदंडों पर प्रभाव पड़ सकता है, लेकिन प्रस्तावक ने उत्सर्जन और उपचार की रोकथाम के लिए सबसे कुशल प्रौद्योगिकियों की योजना बनाई है। इसके अलावा बहिस्त्राव, ठोस/खतरनाक अपशिष्ट का निपटान अलग से किया जाएगा। इसलिए पर्यावरण पर कोई खास प्रभाव नहीं पड़ेगा। शमन उपायों और पर्यावरण प्रबंधन योजना (ईएमपी) के कार्यान्वयन के साथ, प्रस्तावित परियोजना गतिविधियों का स्थानीय आबादी, आर्थिक उत्पादन और अन्य संबंधित सुविधाओं जैसे रोजगार, व्यवसाय, परिवहन, विकास आदि पर सकारात्मक लाभकारी प्रभाव पड़ेगा। जोखिम मूल्यांकन और आपातकालीन प्रतिक्रिया योजना और डीएमपी सहित 3-डी जोखिम मूल्यांकन किसी भी प्रकार के आपात स्थिति के प्रबंधन के लिए तैयार किया गया है । इसलिए समग्र परियोजना औचित्य, प्रक्रिया, प्रदूषण क्षमता और प्रदूषण की रोकथाम के उपायों / प्रौद्योगिकियों को प्रस्तावक द्वारा स्थापित, प्रस्तावक की पर्यावरण प्रबंधन गतिविधियों की तलाश में; यह निष्कर्ष निकाला गया है कि प्रस्तावित परियोजना का पर्यावरण के साथ-साथ परियोजना क्षेत्र की सामाजिक-आर्थिक और पारिस्थितिकीय स्थितियों पर कोई महत्वपूर्ण प्रभाव नहीं पड़ेगा। इसलिए प्रस्तावित परियोजना को पर्यावरण की दृष्टि से सुरक्षित माना जाता है।

<u>पर्यावर्णीय सलाहकार</u>

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